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ACCOUNTING FOR CARBON CREDITS: CONVERGENCE OF US GAAP AND IFRS

By

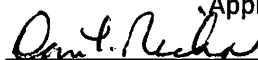
Rob Derivaux

A thesis submitted to the faculty of the University of Mississippi in partial fulfillment of the requirements of the Sally McDonnell Barksdale Honors College.

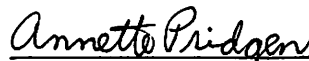
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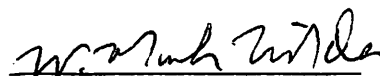
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ABSTRACT

ROBERT PRESTON DERIVAUX: Accounting for Carbon Credits: Convergence of US GAAP and IFRS

(Under the direction of Dr. Dave Nichols)

The thesis concerns the search for a converged International Financial Reporting Standard (IFRS) and United States Generally Accepted Accounting Principles (US GAAP) standard to account for carbon credit trading schemes. Many nations, including those in the European Union, have adopted carbon credit trading schemes in order to reduce carbon emissions. Carbon emissions trading schemes present many accounting challenges, including the exact nature of the credits and how to measure the obligation to which credits will be applied. However, there is not a standard to address these accounting issues. The short-lived former standard was withdrawn because of extensive shortcomings. Currently, participating companies use a variety of approaches to account for carbon credits, and this creates comparability issues in the financial statements. As part of the thesis research, a survey was conducted of graduate accounting students and accounting professionals to solicit input on the possible ways to account for carbon credits. The survey contained a simple scenario of a company's carbon activity for the year. Five distinct approaches were gathered from the surveys and were then scrutinized using existing accounting standards and frameworks promulgated by IFRS and US GAAP. The conclusion was reached that carbon credits granted by the government are not actually a government grant; they should be netted out by an allowance for granted credits. It was also concluded that a liability should be measured as the estimated excess of carbon emissions over held credits both at interim and year-end reporting date. It was also concluded that the research was limited by the lack of a converged IFRS/US GAAP framework, the small size of the survey, and the lack of development of carbon credit trading schemes to date.

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I. INTRODUCTION

The growing concern of the possible effects of global warming has created a wide range of proposed solutions to reduce the production of gases that contribute to the greenhouse effect. One of the principal greenhouse gases is carbon dioxide. As carbon dioxide is a major byproduct of many industrial processes, various plans have been put forth to reduce emissions of carbon dioxide worldwide. The Kyoto Protocol, at the turn of the 21st century, developed a carbon emission trading scheme as a cost-effective way to reduce carbon emissions. Since then, the European Union (EU) and many other nations have either adopted or are in various stages of adopting a carbon emission trading scheme. The purpose of this paper is to anticipate what the converged American and international accounting standard for carbon emission trading schemes will be. This study reviewed prior literature on the development of American and international standards, as well as literature on efforts made by these organizations to establish converged standards. The study examined the accounting issues raised by carbon emissions trading schemes and enlisted the opinions of accountancy graduate students and accounting professionals to help determine what the anticipated standard will be. The opinions of the students and professionals were obtained through a scenario of a typical carbon credit trading scheme.

Accounting Standard Setting in the United States

Before the creation of the Securities and Exchange Commission (SEC) in 1934, there was no official accounting standard setting body in the United States. Since the

Securities Act and the Securities Exchange Act, the SEC has been the federal government's authoritative body for publicly held companies. Originally, the SEC relied on the American Institute of Certified Public Accountant's (AICPA) Committee on Accounting Principles (CAP) and, after 1959, the AICPA's Accounting Principles Board (APB.) However, since 1973, the SEC has relied on the independent Financial Accounting Standards Board (FASB) as the standard writing body for the accounting for private sector companies.

The Financial Accounting Foundation provides support for the FASB to ensure the FASB remains independent. The goal of the FASB is to establish and maintain standards that provide for relevant and reliable financial statements that are useful as decision-making tools for the users of the financial statements. The FASB follows a thorough due process when it considers new issues. If an issue is voted on the agenda by the board, a series of public hearings are held. Then the board issues an Exposure Draft and holds a series of roundtable discussions with all interested parties on the proposed standard. After considering the input from these discussions, the board makes any necessary changes and approves the final standard as a Statement of Financial Accounting Standards (SFAS) by majority vote. Pronouncements by the standard setting bodies that preceded the FASB are still in effect unless they are in conflict with the FASB's standards.

More recently, there have been indications from the SEC that all American-based companies may be required to prepare financial reports using International Financial

Reporting Standards (IFRS). If this change does occur, the SEC would no longer rely on the FASB standard setting body for publically traded companies.

International Standard Setting

The movement towards one set of international standards for financial reporting has its origins in the International Accounting Standards Committee (IASC) created at the 10th World Congress of Accountants in 1972. Nine countries agreed to work towards adopting International Accounting Standards as their national generally accepted accounting principles (GAAP) (Pacter, 2005, p.67). The nine countries were Australia, Canada, France, Germany, Japan, the Netherlands, Mexico, the United Kingdom, and the United States. The first assignment of the IASC was to identify the key areas in which significant accounting differences existed. The list was quite long and highlighted the difficulties facing the new organization. The over-arching goal of their work was "harmonization." In other words, the IASC was attempting to simply write broad principles that would mainly give guidance to individual nations but not replace the principles already in place. This was positive in the sense that it promoted principles-based standards that did not require a myriad of exceptions and bright lines (Pacter, 2005, p.69). However, this often led the individual countries to accept only parts of International Accounting Standards (IAS) or to make their adjustments to the standards. This made the process of creating uniform international financial reporting standards very difficult. This problem of countries picking and tweaking the IAS as they see fit is a major hurdle for IFRS today.

At the turn of the 21st century, the need for a change in course was evident. First, all of the original nine countries still had their own GAAPs, and that did not seem likely to change (Pacter, 2005, p.67). Also, in the last thirty years capital markets had substantially globalized. Companies no longer raised capital only in their own country. For example, the New York Stock Exchange and the National Association of Securities Dealers Automated Quotations (NASDAQ) had a significant number of foreign companies listed, 20% and 10% of their total listings, respectively. In 1981, 173 foreign companies were registered with the SEC, and 22 years later there were over 1,000 (Pacter, 2005, p.71-72.) Consequently, the need for international reporting standards had increased greatly in the twenty years since the founding of the IASC.

In response to this need, the IASC was reorganized into the International Accounting Standards Board (IASB) in 2001. Its purpose was drastically shifted from one of "harmonization" to "convergence." The board's constitution states that one of its objectives is a "*single set of high quality, understandable and enforceable global accounting standards...*" This means that the ultimate goal of the IASB is a uniform set of standards that are identical in all nations (Pacter, 2005, p.71). This is a very lofty goal indeed. This objective received further momentum with a Memorandum of Understanding, known as the Norwalk Agreement, in 2002 between the IASB and FASB. The two organizations agreed to "make their existing financial reporting standards fully compatible as soon as is practicable (Completing the February 2006 Memorandum of Understanding: A progress report and timetable for completion (Norwalk Agreement), 2008, p.1)." The two also committed to short and long term projects to remove

individual differences between the two standards. In 2005, the IASB and FASB reaffirmed their commitments in a second Memorandum of Understanding, called the "Roadmap for Convergence between IFRSs and US GAAP." The Roadmap states that "trying to eliminate differences between the two standards that are in need of significant improvement is not the best use of resources- instead a new common standard should be developed that improves the financial information (Completing the February 2006 Memorandum of Understanding: A progress report and timetable for completion (Norwalk Agreement), 2008, p.1)." The SEC stated, in the fall of 2008, that it might require U.S. issuers to begin a phased adoption of IFRS starting in 2014 (IFRS: Beyond the Standards, 2009, p.35).

The IASB develops new standards through a standardized due process very similar to FASB's. The process starts when the IASB identifies a potential issue and places it on the agenda and then decides whether or not to pursue the issue as a joint project. The first document published is usually the discussion paper, which is designed to present preliminary opinions of the authors and to receive early comment from the public. The next step, the exposure draft, is mandatory and is the proposed standard. After another comment period, the IASB members can re-draft a new exposure draft or approve the original exposure draft. The proposed standard might be adjusted if significant issues are raised by the public or if new evidence is considered. When the members approve an exposure draft, it becomes an International Financial Reporting Standard (IFRS).

In the Norwalk Agreement (the Memorandum of Understanding), the FASB and IASB established their commitment to convergence standards. The Agreement set out a roadmap, establishing short and long-term projects needed to reach this goal of convergence. The short-term topics include: fair value, investment properties, research and development, subsequent events, borrowing costs, government grants, joint ventures, segment reporting, impairment and income tax. The first four topics will be examined by FASB; the next four topics will be examined by IASB; and the last two topics will be researched jointly. After extensive research, the two boards will publish new joint standards that apply to IFRS and US GAAP. Again, it is important to note that the goal is higher quality standards, instead of simply eliminating the differences between two conflicting standards.

The FASB and the IASB have issued standards on a number of short-term convergence projects. Bringing US GAAP into line with IFRSs, the FASB issued new or amended standards that introduced a fair value option (SFAS 159) and adopted the IFRS approach to accounting for research and development assets acquired in a business combination (SFAS 141R). Converging IFRSs with US GAAP, the IASB published new standards on borrowing costs (IAS 23 revised) and segment reporting (IFRS 8). The IASB's active agenda is described in Table 1.

Conceptual Framework

The foundation of any set of standards is a conceptual framework. The goal of all of the standards is to put the financial statements in line with the conceptual

framework. The framework also serves as the basis for future standards. The conceptual framework project is the largest current joint project between the IASB and FASB. This project is divided into eight phases, with the first four currently active. Phase A, Objectives and Qualitative Characteristics, has produced an exposure draft on which the comment period ended September 29, 2008. There are some areas in which the project intends to improve some parts of the existing frameworks (i.e. recognition and measurement), or to fill some gaps in the current frameworks. For example, neither the IASB nor FASB includes an adequate concept of a reporting entity (Exposure Draft: Objective and Qualitative Characteristics, 2009, p.9). The lack of a converged framework makes it very problematic to jointly develop converged standards, because by definition, the framework is the guiding logic behind the standards.

When the framework is complete, it will not override any existing IFRSs. Consequently, there is some debate over how much authority the new framework will have. Currently, the IASB's *Framework* has authority when there is no standard to address the issue, but the FASB Concepts Statements generally only have the same authority as textbooks and articles. The Exposure Draft indicates that the new joint framework will be elevated to a status comparable to the *Framework* in IFRS (Exposure Draft: Objective and Qualitative Characteristics, 2009, p.16).

The Exposure Draft on the Conceptual Framework project establishes the objective of financial reporting as providing information about the reporting entity that is useful to capital providers (Exposure Draft: Objective and Qualitative Characteristics,

Table 1

IASB ACTIVE AGENDA NEW STANDARDS AND MAJOR PROJECTS

	MoU[Note 1]	Joint[Note 2]
Common control transactions		
Consolidation	✓	✓
Derecognition	✓	✓
Emissions trading schemes		✓
Fair value measurement guidance	✓	
Financial statement presentation	✓	✓
Government grants [Note 3]		
IFRS for Private Entities		
Income taxes	✓	✓
Insurance contracts		
Leases	✓	✓
Liabilities [Note 4]		
Financial Instruments with the characteristics of equity	✓	✓
Management commentary		
Post-employment benefits (including pensions)	✓	
Revenue recognition	✓	✓

Notes

1. These projects are part of the **Memorandum of Understanding** that sets out the milestones that the **FASB** and the **IASB** have agreed to achieve in order to demonstrate standard-setting convergence.
2. These joint projects are being undertaken with the **FASB**. The two organizations are working together on these areas. Even though **joint ventures** and **post-employment benefits** are not being undertaken with the **FASB**, in each case the **IASB** has committed to improve the related **IFRSs**.
3. Work on this project has been suspended.
4. The project on **liabilities** deals with proposed amendments to **IAS 37**.

2008, p.5). It also establishes that the two fundamental qualitative characteristics are relevance (capable of making a difference) and faithful representation (accurate and neutral) (Exposure Draft: Objective and Qualitative Characteristics, 2008, p.6). Also the two pervasive constraints are stated as materiality and cost. The draft states “financial reporting should provide information about the economic resources of an entity (assets) and the claims to those resources (liabilities and equity)” (Exposure Draft: Objective and Qualitative Characteristics, 2008, p.15).

Joint Projects

One example of a successful joint project between the IASB and FASB relates to business combinations. This was a particularly important and complicated topic, given the increasing number of business mergers and the complexity of the mergers. As in other joint projects, there was an emphasis on substance over form, in other words an emphasis on the principles behind the accounting. This standard stated that the accounting for the combination should reflect the effective control of the entity. Previously, international standards allowed for the pooling-of-interests method, which had been ended in the United States for some time. In this instance, instead of trying to reach a compromise between two different practices, the project chose to completely prohibit an inferior method. Also, the new standard allows for more use of fair value measurements at acquisition than had been in use in the U.S. The current trend is moving towards fair value over historical cost, and this is an example of FASB beginning to accept this trend. Also, the new standard changed the process of amortizing goodwill

to one of testing for impairment, which is done in the U.S. However, the standard provided for a method of measuring impairment that was different from the U.S. method at the time. Once again, instead of simply picking a middle road or one standard over the other, the Boards created a standard that they felt was of higher quality and more in line with reflecting reality than either previous standard. This new standard was a major step towards convergence, and it can be assumed that a similar path will be followed on future and current joint projects.

The accounting for carbon emissions trading schemes is another joint project on which the two Boards are working. There is an Exposure Draft due on this project in the second half of 2009 with an International Financial Reporting Standard to come out in 2010. The next section of the thesis will focus on the accounting issues raised by carbon emissions trading schemes. Following this, the issues will be analyzed using the US GAAP and IFRS Conceptual Frameworks as well as using US GAAP, IFRSs, and converged accounting standards. A survey of accounting professionals and graduate students was conducted. The analysis of their responses was then used to form a conclusion about how a future converged international standard for accounting for carbon emission trading systems should be structured.

II. EMISSIONS TRADING SCHEMES and RELATED ACCOUNTING ISSUES

Emissions Trading Schemes

As concerns about the effects of global warming have increased in recent years, so have movements to reduce the amount of carbon dioxide produced by companies around the world. The Kyoto Protocol was designed with this goal and came into effect in 2005. The United States has not ratified the Treaty. The Treaty requires most industrialized nations to reduce their emissions to roughly their 1990 levels by 2012 through a cap and trade scheme. In a cap and trade scheme, a fixed amount of carbon emissions is set, and allowances are established for carbon emissions. Companies then trade the credits in a market. Companies that are below their expected emissions for the time period could sell their credits to companies that were producing more than expected. These schemes are thought to be superior to a direct tax on carbon emissions because it allows market forces to reduce carbon emissions in the most effective manner. These schemes create a whole new industry that is similar to the financial industry in that there are carbon traders, specialists, carbon managers, carbon auditors, carbon funds, and more (EU Action Against Climate Change, 2007 p. 7).

Here is an example of how the cap and trade scheme can be effective. Suppose companies A and B are both allocated allowances for 95 tons of emissions, but last year they each produced 100 tons of emissions. Company A can reduce its carbon production at \$5 per ton, but it costs company B \$10 per ton. Now suppose that company A reduces its emissions by 10 tons to 90 tons for the year at a cost of \$50. It

can then sell its extra 5 tons of emissions to company B at \$7 a ton for \$35. Company A netted a cost of \$15 to lower its emissions significantly, while company B spent \$35 to do the same for a combined cost of \$50. If there had not been a trading marketplace for the carbon emissions, A would have spent \$25 and B would have spent \$50, for a total cost of \$75.¹

European Union Emissions Trading System

The European Union Emissions Trading system (EU ETS) is the world's largest trading scheme for carbon dioxide emissions. This system applies to the largest carbon producers in Europe that account for about half of Europe's carbon production. This includes the energy-intensive industries like steel production, oil refineries, and factories that produce cement, ceramics, and paper. In total, the EU ETS encompasses about 10,000 installations (EU Action Against Climate Change, 2007, p. 9). The EU plans to expand the system to more industries in the coming years. The plan's goal is to meet the EU's Kyoto Protocol requirements at a cost of less than 0.1% of Europe's gross domestic product. To accomplish this goal, EU companies must budget their carbon dioxide production and manage these budgets very carefully.

Ownership of the credits is tracked through a centralized registry much like the ownership of money is tracked in a banking system (EU Action Against Climate Change, 2007, p. 16). This government-imposed scarcity of carbon credits makes them a

¹ This example borrowed heavily from the example on page 10 of EU Action Against Climate Change

commodity like any other scarce resource. As such, exchanges and brokers for carbon have developed in Europe. While the prices have been quite unstable in this new market, it is growing rapidly and was worth €14.6 billion in 2006. The EU estimates that companies have budgeted nearly €3 billion euro for carbon related expenses in the 2008-12 period. The EU ETS system is very open to linking itself to areas outside of Europe and to eventually create a truly global market for carbon. The EU ETS expanded to include Norway, Iceland, and Liechtenstein in 2008 and, in the next few years, may link with programs in Australia, Canada, California, and other U.S. states. It is clear that there is a global push towards cap and trade carbon emissions schemes, and a standard method to account for carbon is an important part to the success of these schemes. This study focuses on the development of an accounting standard for companies taking part in such schemes, but not on institutions that engage in active trading of credits such as carbon traders or financial institutions.

In a carbon emission trading system, there are two ways to acquire carbon credits. The first method is through the allocation process. Each nation has its own transparent allocation process that allocates most of the credits (allowance for one ton of carbon dioxide production) to the companies in each country for free. Generally, companies will be allocated fewer credits than the amount that would satisfy their expected carbon emissions. The second method of acquiring carbon credits is through purchase. The remaining credits are sold by the government at auction, and any entity can buy credits from the companies that were originally allocated them. Throughout the year, an obligation to the government exists as carbon dioxide is emitted. At the

end of the year, the installations must turn in allowances equal to the tons of carbon emissions they produced during the year. Excess allowances can be saved or sold. In other words, there are two ways through which a credit can be disposed, through sale or to fulfill the obligation. Companies in excess must pay a stiff fine as well as turn in allowances the next year in arrears.

Accounting Issues

Initially, the IASB's interpretive arm, the International Financial Reporting Interpretations Committee (IFRIC), issued IFRIC 3, *Emissions Rights*, to provide guidelines for accounting for cap and trade schemes. However, in 2005, the IASB withdrew the standard because of extensive shortcomings, including an inflated balance sheet, volatility in the financial statements, and a lack of proper matching of revenues and expenses. This standard provides the basis that many companies use for their accounting for the cap and trade. Since the withdrawal of the standard, a variety of distinct approaches to accounting for cap and trade systems have developed, and many of these approaches are significantly different than the approach outlined in the now defunct IFRIC 3. A converged method is important not only for establishing the superior approach to accounting for carbon trading schemes but also to achieve comparability among companies worldwide, as more nations (and U.S. states) adopt mandatory carbon emissions cap and trade schemes. *The CPA Journal* agrees on the urgency of the issue stating, "With the emerging consensus for increased climate control, the

accounting profession finds itself largely unprepared for the current and future financial instruments emerging from green legislation (Elfrink and Ellison, 2009, p.33)."

Carbon emissions trading schemes are quite unlike anything that corporations have had to account for in the past. There are four main areas in which accounting issues arise when dealing with carbon credits. The first area deals with the accounting for the allowance at initial acquisition, the second with accounting for the obligation to turn in credits, the third with holding credits, and the final with disposing of credits through sale or redemption.

As noted, there are two principal means of acquiring a carbon credit, either through purchase or through government grant. The credits obtained by purchase are relatively straightforward. The debiting of an asset account at historical cost and credit of the asset given up in exchange for the credit seems pretty simple. However, dealing with the granted credits is a bit more complicated. The former standard called for the credit to always be debited at fair value with a credit to deferred income if the credit was obtained through a grant. However, the purchases gained through grant do not have historical cost and many questioned the approach of the former standard. The two main approaches currently used are to either debit the asset at fair market value on the day of acquisition or record the asset at nil value (zero value). The fair market value approach depends on the existence of an active market for carbon credits at the time of the grant. The nil value technique is consistent with the historical cost concept but seems unreasonable, because the allowances clearly do have value and the recording of

any asset at zero seems odd. The acquisition of credits through grant raises other questions. Should a revenue account, deferred revenue account, or something else be credited in this situation?

Another major accounting issue related to a carbon credit trading scheme is how to account for the obligation created by actual carbon emissions. Should a liability be accrued throughout the year as carbon is produced? If so, would it be based on time or on an activity driver? Also, the value of the obligation is an issue. Should it be equal to the estimated amount of total credits needed at market value? Does the liability represent the excess of carbon credits needed over the number of credits owned by the company? The liability would also be difficult to value if the second method is used and the company owns a combination of purchased credits and granted credits that are at nil value. A third method for valuing the obligation could be based on the value of currently held credits plus the lacking credits at market value. Under IFRIC 3, a liability was recognized for the amount of emissions produced times market value, regardless of the number of credits held.

Accounting for the credit while on the books also presents issues. The first deals with classification. Options for classification include, among others, "Other Current Asset," "Inventory," and "Intangible Fixed Assets." Classification could vary based on whether management intends to hold the credit to fulfill the obligation for carbon emissions or to trade the credit. One issue is whether or not credits should be amortized or reduced through a contra account as the company emits carbon during the

year. Many companies do neither of these, although it is reasonable to acknowledge that an asset (the credit) is being used up for an economic benefit (ability to emit carbon dioxide.) As part of this issue, it is not certain whether the amortization should be based on time or based on an activity driver such as production. The previous standard (IFRIC 3) considered credits to be Intangible Fixed Assets, allowed for a cost or a revaluation approach, and did not require amortizing.

Finally, the disposition of the carbon credit raises issues. If the credit is sold, the amount to recognize as revenue is difficult to establish and would partially depend on the actions taken at acquisition of the asset. For instance, the sale of credit that had been recorded at nil value would yield more revenue than a credit recorded at market value or historical cost. Also, if the allowance is sold, where should the revenue be reported? Proceeds from the sale could be recorded as a revenue, as a reduction of cost of goods sold, or as something else. If granted credits are sold at the beginning of the year only to be bought back again later to meet the company's obligation, crediting a revenue account would seem inappropriate. If the credit is used to fulfill an obligation to the government, the accounting for this transaction is also uncertain and would depend partially on how the company recorded its obligation to turn in credits during the year (whether through amortization of credits, a contra account, or an accrued liability.)

III. SURVEY AND ANALYSIS

As part of the research into the accounting for carbon credit trading schemes, a survey was conducted. The respondents were divided into two groups. The first group was comprised of The University of Mississippi's Patterson School of Accountancy Alumni Advisory Board (comprised of accountancy alumni working in various fields), doctoral candidates at the University, and accountancy professors at the University. This group is collectively referred to as the accounting professionals. The second group was comprised of accounting students in the masters' program; this group is referred to as the graduate students. The survey contained a brief description of a carbon credit trading scheme followed by a scenario with three events. Participants were asked to make accounting entries for the three events. The following is the scenario used in the survey. A copy of the complete survey is found in Appendix C.

Scenario

1. On January 1, 2009, company X is granted 100 credits, free of charge. Market value at 1/1/09 is \$10 per credit. Company X estimates it will emit 120 tons this year.
2. By 6/30/09, interim reporting date, 70 tons have been emitted. X has raised its estimate to 125 tons for the year. Market value is \$12 per credit.
3. At year-end, company has produced 130 tons of carbon emission. The company buys the lacking 30 credits for \$14 each, market value, and turns all the credits in to the government.

Please make any required accounting entries relating to the above transactions. Please add any necessary explanations.

1. January 1, 2009
2. June 30, 2009
3. December 31, 2009

Results of Survey

Twelve replies from the professionals and twelve replies from the graduate accountancy students were received. While the responses were quite varied, especially among the graduate students, five distinct approaches emerged with slight variations within the approaches. The variations within each approach were mainly due to the fact that some respondents adjusted the credits to market and others did not or to the fact that some respondents used the future estimates of carbon emissions in measuring the obligation. Each method has its own set of pros and cons. The remaining responses (12.5%) were varied and did not represent an effective approach to accounting for the scenario presented. The five approaches will be summarized below along with the journal entries that correspond to the scenario. The financial statement effects of the different methods are shown in Appendix A.

The most common approach, Method A, (29% of total, 8% of graduate students, and 50% of professionals) chose not to recognize government granted carbon credits as an asset, and only recognize them as an asset in the event of the purchase of credits. These purchased credits could be viewed as a prepaid expense like prepaid insurance.

Further, they would only recognize a liability when actual emissions exceed granted credits. They also suggested the use of memo entries to record the granted credits and a footnote to the financial statements explaining carbon credit-related activity during the year. It should be noted that if the credits are not turned in during the reporting period, a credit would be made to Carbon Emissions Liability in place of the credit to Carbon Credits.

Method A Journal Entries

1) 1/1 Grant of Credits

Memo entry to record the 100 granted credits

2) 6/30 Interim Reporting Date

Footnote disclosure in interim statements about carbon-related activity including future estimates of carbon emissions.

3) 12/31 Year-End

Carbon Credits (asset)	420
------------------------	-----

Cash	420
------	-----

(to record purchase of credits)

Carbon Emission Expense	420
-------------------------	-----

Carbon Credits (asset)	420
------------------------	-----

(to record turning in of credits to government)

One of the most obvious advantages of Method A is its simplicity, with only two actual journal entries. Another advantage is that its journal entries only reflect actual economic events or transactions. The granted credits are not an economic asset to be used up, but instead are permission to emit carbon. Not recognizing the granted credits also follows the historical cost principle. This approach avoids the “marking-up” effect on the balance sheet, an issue with many firms in the former standard. It is worth noting that the professionals heavily favored this approach.

One disadvantage is that it does not recognize any expense or liability related to carbon credits at the interim reporting date. Carbon emissions expense is actually generated throughout the year, but it could be disclosed in the footnotes. Another disadvantage is that it does not recognize the value of the granted credits on the balance sheet, even though there would likely be an active market for the credits. However, the average company would not be involved with buying and selling credits on a regular basis and instead would hold its credits to submit to the government, so one could argue that the granted credits do not need to be recognized as an asset.

Another common approach, Method B, (16% of total, 8% of professionals, and 25% of graduate students) was to record the granted assets at fair market value (FMV) and to credit a Granted Carbon Credit Allowance Account to act as a contra-asset account. Half of those who used Method B marked the granted assets up to market at the interim and final reporting dates and made a corresponding credit to the allowance account, but this is not illustrated in the following example. The financial statement effects of adjusting to market price would only have a net balance sheet effect if

purchased credits were held by the company and revalued, because granted credits would still be negated by the Allowance for Granted Carbon Credits. This variation to Method B is shown in Appendix A as Method B*.

Method B Journal Entries

1) 1/1 Grant of Credits

Carbon Credits (asset)	1,000
Allowance for Granted Carbon Credits	1,000
(to record grant of credits at FMV)	

2) 6/30 Interim Reporting Date

Footnote disclosure in interim statements about carbon-related activity including future estimates. (There could also be a journal entry marking the credits to market.)

3) 12/31 Year-End

Carbon Credits (asset)	420
Cash	420
(to record purchase of credits)	

Carbon Emission Expense	420
Allowance for Granted Carbon Credits	1,000
Carbon Credits (asset)	1,420

(to record carbon emission expense and the turning in of credits)

The ultimate effect on the financial statements of Method B is very close to that of Method A; they also have many of the same advantages and disadvantages. This approach has the effect of netting out the carbon credits so that the only amount that effects net assets is the purchased credits while at the same time recognizing all of the company's credits as a line item on the balance sheet. In a sense, this brings it in line with the historical cost principle. However, Method A proponents could argue that the granted credits should not be on the balance sheet at all. Like Method A, Method B recognizes emissions expense only at the end of the year, when it technically is actually incurred throughout the year.

A third approach, Method C (12.5% of total, 8% of professionals, and 16.7% of graduate students), also recognized the granted credits at FMV and credited a deferred income account. They then released deferred income to a revenue account by amortizing it over the 12-month period. Two-thirds of those who used Method C adjusted the granted credits to market value at reporting dates. Another way to recognize FMV of the granted credits is to recognize the expense for the period based on the market price at reporting date, which is done in the following example.

Method C Journal Entries

1) 1/1 Grant of Credits

Carbon Credits (asset)	1,000
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Deferred Income	1,000
(to record grant of credits at FMV)	
2) 6/30 Interim Reporting Date	
Carbon Emissions Expense (\$12x70)	840
Carbon Emissions Liability	840
Deferred Income (1/2 x \$1,000)	500
Carbon Credit Income	500
(to record accrued emissions expense and amortize deferred income)	
Carbon Credits (asset) (100 x \$2 to adjust to FMV)	200
Carbon Credit Income	200
(adjust credits to FMV)	
3) 12/31 Year-End	
Carbon Emissions Expense [(\$14x130)-840]	980
Deferred Income (1/2 x \$1,000)	500
Carbon Emissions Liability	980
Carbon Credit Income	500
(to record emissions expense for rest of the year and amortize remaining deferred income)	
Carbon Credits (asset) (100 x \$2 to adjust to FMV)	200
Carbon Credit Income	200

(to adjust credits to FMV)

Carbon Credits (asset)	420
Cash (Purchase of additional credits)	420

(to record purchase of credits)

Carbon Emissions Liability	1,820
Carbon Credits (asset)	1820

(to record turning in of credits)

The main advantage of this method lies in the fact that it allows for an estimate of carbon emissions expense at the interim date, and it allows for better matching of expenses with revenues. The expense is partially offset by the income recognized from the granted credits. Another advantage is that granted carbon credits clearly have market value and perhaps should be listed on the balance sheet. However, one could argue that there is really nothing earned when companies are granted credits and so revenue should not be recognized. A second issue with this approach is that the carbon credits themselves are not used up during the year and perhaps should not be written off as an expense as carbon is emitted. One could argue that the asset and deferred income recognized at the grant date serve to inflate the balance sheet. This approach does not follow historical cost as the credits are obtained for free. Also, this approach could lead to considerable volatility in the financial statements. A final issue with Method C is that it is somewhat complex.

The second most common approach, Method D (20% of total, 16.7% of professionals, and 25% of graduate students), also recognized the granted credits at FMV, but credited a liability account. One-fifth of those who used this method adjusted the credits to market price at reporting dates and 40% also recognized the estimated excess emissions over the granted amount as part of the liability. The estimates are included in the following example, but the credits are not marked up to market value. At interim date, the expense is recognized as the percent of the estimated excess of carbon emissions over granted credits.

Method D Journal Entries

1) 1/1 Grant of Credits

Carbon Credits (asset)	1,000	
Carbon Emissions Liability		1,000
(to record granted credits at FMV)		

2) 6/30 Interim Reporting Date

Carbon Emissions Expense $((70/125) \times 25)12$	168	
Carbon Emissions Liability		168
(to record accrued emissions expense)		

3) 12/31 Year-End

Carbon Credits (asset)	420
Cash	420
(to record purchase of credits)	
Carbon Emissions Liability	1,168
Carbon Emissions Expense [(\$14x30)-168]	252
Carbon Credits (asset)	1,420
(to record turning in of credits and emissions expense for the second half of the year)	

Method D is very similar to Method C in that they both recognize the granted credits as an asset. However, Method C calls for a credit to a Carbon Emissions Liability account. An advantage to Method D over C is that one could argue that it is more appropriate to record a liability that eventually is converted into an expense than it is to credit deferred income, which is eventually converted into income. Besides that distinction, the same advantages and disadvantages apply to Method D as to Method C. One advantage includes allocating the carbon emissions expense throughout the year by means of a weighted average and recognizing the value of credits held by the company. The disadvantages include violating historical cost, complexity, and inflating the balance sheet. Also, one could argue that a liability does not exist when the credits are granted, but rather is only generated when emissions exceed credits held.

A final and interesting approach, Method E, was used by one of the professional respondents (4% of the total.) He or she did not record the granted credits as an asset. Instead he or she applied the cost of the additional credits to inventory through a

manufacturing overhead (MO) account. He or she used the estimate at the beginning of the year to measure a liability equal to the estimated excess of emissions and then applied it to inventory as the emissions were created.

Method E Journal Entries

1) 1/1 Grant of Credits

Manufacturing Overhead Clearing Account	200
Estimated Liability for Purchase of Carbon Credits	200
(to record estimated liability and establish overhead clearing account)	

2) 6/30 Interim Reporting Date

Inventory $((70/125) \times 25) \times 12$	168
Manufacturing Overhead Applied	168
(to apply emissions expense to inventory based on weighted average)	

Manufacturing Overhead Clearing Account $[(\$12 \times 25) - 200]$	100
Estimated Liability for Purchase of Carbon Credits	100
(to record increase in estimated liability for carbon emissions)	

3) 12/31 Year-End

Manufacturing Overhead Clearing Account $[(\$14 \times 30) - 300]$	120
Estimated Liability for Purchase of Carbon Credits	120
(to record increase in estimated liability for carbon emissions)	

Estimated Liability for Purchase of Carbon Credits	420
Cash	420
(to record purchase of carbon credits)	
Inventory ((\$14x30)-\$168))	252
Manufacturing Overhead Applied	252
(to apply emissions expense to inventory for second half of the year)	

Method E is similar to Methods A and B in that it does not recognize the granted credits as a net asset on the balance sheet. However, instead of recognizing the carbon emissions expense during the year, the cost of the purchased credits is applied to inventory manufactured during the period. This could be appropriate because the emissions expense could be viewed as part of manufacturing expense and ultimately part of Cost of Goods Sold. One concern would be comparability with other companies that do not choose to use this method. If the company does not sell a consistent amount of inventory each reporting period, then emission expenses could be buried in inventory until it is sold. Another disadvantage of this method is that it is a very complex approach (this simple scenario required six complex entries.)

IV. CONCLUSION

Considering the input received from the survey and the research into the nature of carbon credit trading schemes and into existing standards and conceptual framework, a revised version of Method B incorporating the estimate approach used in Method D is recommended as the best basis for a converged standard to address the accounting for carbon credit trading schemes. Some final considerations for this conclusion follow.

Governmental Grants

IAS 20, Accounting for Governmental Grants and Disclosure of Government Assistance, defines governmental grants as “assistance by the government in the form of transfer of resources with certain conditions.” It goes on to define ‘assistance’ as action provided by the government designed to provide an economic benefit specific to an entity or range of entities qualifying under certain criteria. The standard calls for a non-monetary grant to be recognized at fair value at grant date and a corresponding deferred income to be amortized over a period matching the expenses associated with the grant. While carbon credits do have some characteristics of a governmental grant, they do not fully fit the accounting definition of a governmental grant. Instead of being governmental assistance, carbon credits are actually an imposed cost on the entity by the government (on a previously free activity) and are not designed to produce income for the entity. Furthermore, the credits are not an asset to be used up by the entity, but rather are to be temporarily held by it and returned to the government at the end of the

year. In light of this, carbon credits received at no cost from the government should not be treated as a government grant. This would rule out the use of Method C.

Assets

The search for a converged standard to deal with carbon credit trading schemes is complicated by the lack of a converged conceptual framework. Work towards a converged framework is currently underway. According to the IASB Framework, an asset is a resource controlled by an entity as a result of past events and from which future economic benefits are expected to flow to the entity. The FASB framework is virtually the same except “probable” is used instead of “expected.” Currently, the boards have reached a tentative joint decision to define an asset as a “present economic resource to which the entity has a right.” The joint decision describes an economic resource as something that is scarce and capable of producing cash inflows or reducing outflows. In light of this statement, the recognition of granted assets as an asset at fair value seems prudent.

However, in the framework, it is acknowledged that contradictions can and may exist between some specific standards and the framework. Consequently, there is some room for variation in specific standards. There is not a converged definition for intangible assets, but *IAS 38, Intangible Assets*, describes intangible assets as “any identifiable non-monetary asset without physical substance.” Clearly, if a granted carbon credit were an asset, it would be considered intangible. IAS 38 goes on to state “an intangible asset shall be recognized only if it is probable that the expected future

economic benefits that are attributable to the asset will flow to the entity.” One could argue that the credits provide the economic benefit of allowing carbon emissions. However, since the carbon emissions trading scheme is really a cost imposed on entities by the government (on a previously free activity), the credits only represent an economic benefit if they are sold for a profit. The sale of credits would not be ‘probable’ for most entities. Therefore, granted credits should not be recognized as an asset upon receipt at nil value from the government. This conclusion leads to the elimination of Method D from consideration.

If, however, credits are purchased on the market, they must be recognized as an asset on the balance sheet. They are the result of an economic transaction between two entities. They have a cost basis that must be held on the balance sheet until expensed, much in the manner that pre-paid insurance is recorded as a pre-paid expense. Since the liability recognized by the company changes with changes in market prices, the company may re-value the purchased credits to market or hold them at historical cost, as long as it is consistent. The former standard allowed for this re-value option.

Accounting Estimates/Interim Reporting

According to *IAS 37, Provisions, Contingent Liabilities, and Contingent Assets*, a liability of uncertain timing or amount should be recorded when (a) an entity has a present obligation of a past event, (b) it is probable that an outflow of resources will be required to settle the obligation, and (c) a reliable estimate can be made of the

obligation. *IAS 34, Interim Financial Reporting*, notes that greater use of estimates is more acceptable in interim financial statements than in year-end financial statements in order to provide a more accurate picture of the entity's financial position. Taking these two standards into consideration, it is apparent that some measure of carbon emissions expense should be recognized at interim dates for an entity that expects to exceed its granted credits by the end of the year. The weighted average approach is the most accurate way to allocate the expense to the interim period and works as follows: (tons emitted/estimated total tons of emissions)x(expected excess of emissions over held credits)x(market value at reporting date). At year-end, an entry is made to carbon emissions expense equal to the total emissions expense for the year minus the expense recognized at interim date. This weighted average approach to estimating carbon expense at interim dates is used to recognize carbon emissions expense in Method D and should be incorporated in a final standard.

While Method E does not appear to violate any of the principles discussed above, it is not a recommended approach because of the disadvantages mentioned in its initial discussion. The approach is too complex and could create comparability issues, both between reporting periods and between different companies. It would also not be helpful for users who are specifically interested in a company's carbon emission expense.

Recommended Approach

The remaining two approaches are Methods A and B, and it is reasonable that they would be the most acceptable considering they were preferred by the accounting professionals surveyed. They accurately reflect the reality that most companies would not deal with credits as a constantly traded asset, but they would rather view the credits as a temporarily held item to fulfill an imposed obligation from the government. These methods also reflect the reality that a liability only really exists for the market value of excess credits needed. However, since the credits do represent a potential, though unlikely, future economic benefit, Method B is preferable. Method B allows for recognition of the granted credits as a line item on the balance sheet but avoids the mark-up effect of recognizing a net asset or a liability from the granted credits. It also avoids the volatility of the other approaches. Considering the principles concerning interim reporting, the weighted average approach should be used to estimate carbon emissions expense at interim dates. If the granted credits are sold during the year, a deferred income account must be credited until the company can be reasonably certain that it will not be forced to re-purchase some of the credits. The scenario according to this revised Method B would be:

Recommended Method Journal Entries

1) 1/1 Grant of Credits

Carbon Credits (asset)	1,000
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Allowance for Granted Carbon Credits	1,000
(To record granted credits at 1/1/09)	
2) 6/30 Interim Reporting Date	
Carbon Emissions Expense $[(70/125) \times 25] \times \12	168
Carbon Emissions Liability	168
(To record estimated liability for carbon emissions using weighted average at interim reporting date 6/30/09)	
3) 12/31 Year-End	
Carbon Emissions Expense $[(\$14 \times 30) - 168]$	252
Carbon Emissions Liability	252
(To record carbon emissions expense and liability at year-end)	
Carbon Credits (asset)	420
Cash	420
(Record purchase of credits at year-end)	
Carbon Emission Liability	420
Allowance for Granted Carbon Credits	1,000
Carbon Credits (asset)	1,420
(To record turning in of carbon credits to government)	

It should be noted that this study faced several limitations. First of all, the sample surveyed was quite small. It was not intended to be representative of all American accounting professionals but merely a means of providing some input on possible approaches to accounting for carbon credits. Also, the survey was a bit simplistic in order for it to be workable by the respondents. It was a means for establishing the principles that should guide the formation of a standard approach to accounting for carbon credits. Thirdly, it is difficult to make a decision about a converged standard when a converged framework has not been completed. The IASB and FASB should press forward on creating a joint framework as quickly as possible. Finally, developing an accounting standard for such trading schemes is difficult when the schemes are still in their infancy (and do not even exist in the U.S.), and no one is certain exactly how they will develop.

Conclusion

In conclusion, based on existing accounting standards and frameworks and on the results of the surveys, the joint project of the IASB and the FASB should adopt a standard for accounting for carbon emissions trading schemes based on the method recommended in this study. The recommended method recorded all credits as an asset at fair value but offset the granted credits with an allowance for granted credits account. The method recognizes a liability equal to the excess of credits needed over held credits and recognizes a liability at interim dates using a weighted average

estimate. This approach allows for the fairest representation of carbon credits and the related expense for companies involved in a carbon credit trading scheme.

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APPENDICES

APPENDIX A

Effects on the Financial Statements of the Methods to Account for Carbon Credits

Methods

	A	B	B*	C	D	E	Final
Income Statement-Interim							
Carbon Credit Income				700			
Carbon Emission Expense	-	-	-	-840	-168	-	-168
Net Income - Interim	0	0		-140	-168	0	-168
Balance Sheet-Interim							
Carbon Credits		1,000	1,200	1,200	1,000		1,000
Allowance For Granted Credits		-1,000	-1,200				-1000
Deferred Income				-500			
Carbon Liability				-980	-1168	-300	-168
Inventory	-	-	-	-	-	168	
Net Assets- Interim	0	0	0	-280	-168	-132	-168
Income Statement Year End							
Carbon Emission Exp	-420	-420	-420	-1,820	-420		-420
Carbon Credit Income	-	-	-	1,400	-	-	
Net Income	-420	-420	-420	-420	-420	0	-420
Balance Sheet – Year End							
Inventory						420	
Cash	-420	-420	-420	-420	-420	-420	-420
Net Assets	-420	-420	-420	-420	-420	0	-420

Since the obligation to turn in credits to the government was fulfilled at year-end, all the methods yielded the same year-end results except for Method E. However, they produced very different results at interim reporting dates on the income statement and balance sheet.

APPENDIX B

Websites of Organizations Mentioned

European Commission Climate Action: http://ec.europa.eu/climateaction/index_en.htm

Financial Accounting Standards Board: www.fasb.org

International Accounting Standards Board: www.iasb.org

U.S. Securities and Exchange Commission: www.sec.gov

Appendix C

Survey

A typical carbon trading scheme has the following characteristics:

- (1) The government grants a certain number of credits that represent 1 ton of carbon dioxide emission to companies free of charge at the beginning of each year.
- (2) Companies generate an obligation to turn in credits equal to their carbon emissions at year-end. Failure to turn in the appropriate number of credits will result in a large fine, and the company must make up for the difference in arrears.
- (3) Companies can buy and sell credits from each other to meet their obligation. In other words, they have three options every year: (a) meet its granted allocation of carbon credits, (b) Reduce emissions below its allocation and sell excess credits or save them for future years, or (c) Buy additional credits from the market to meet its obligation.
- (4) Excess credits may be carried forward into future years.
- (5) The scheme allows for “carbon traders” who trade carbon credits for a profit. It can be assumed that an active market for credits exists.

Accounting Issues

Initially, the IASB issued IFRIC 3 to provide guidelines for accounting for cap and trade schemes. However, in 2005 the IASB withdrew the standard because of extensive shortcomings. Since the withdrawal of the standard, a variety of distinct approaches to

accounting for cap and trade systems has developed, and many of these approaches are significantly different than the approach outlined in the now defunct IFRIC 3. There are two main accounting issues that arise when dealing with carbon credits. The first area deals with the accounting for the allowance at initial acquisition when acquired through government grant, and the second deals with accounting for the obligation to turn in credits.

There are two principal means of acquiring a carbon allowance: through purchase or through government grant. The former standard called for the granted allowances to be debited at fair value and for a credit to deferred income. However, this was one of the main points of contention in the withdrawn standard. The two main approaches currently used by companies are to either debit the asset at fair market value on the day of acquisition or record the asset at nil value. It can also be difficult to determine how to classify the allowance on the balance sheet.

Another major accounting issue related to a carbon credit trading scheme is how to account for the obligation to turn in the credits at the end of the year. Also, the value of the obligation is an issue. Should it be equal to the estimated amount of total credits needed at market value? Or the liability could represent the excess of carbon credits needed over the number of credits owned by the company. The liability would also be difficult to value if the second method is used and the company owns a combination of purchased credits and granted credits that are at nil value. A third method for valuing the obligation could be valuing the obligation at the value of currently held credits plus

the lacking credits at market value. Under IFRIC 3, a liability was recognized for the amount of emissions produced times market value, regardless of the number of credits held.

Scenario

1. On January 1, 2009, company X is granted 100 credits, free of charge. Market value at 1/1/09 is \$10 per credit. Company X estimates it will emit 120 tons this year.
2. By 6/30/09, interim reporting date, 70 tons have been emitted. X has raised its estimate to 125 tons for the year. Market value is \$12 per credit.
3. At year-end, company has produced 130 tons of carbon emission. The company buys the lacking 30 credits for \$14 each, market value, and turns all the credits in to the government.

Please make any required accounting entries relating to the above transactions. Please add any necessary explanations.

1. January 1, 2009
2. June 30, 2009
3. December 31, 2009

Other Issues – Based on your knowledge and the background information presented, do you see any other significant accounting issues related to carbon credit trading schemes? Feel free to provide any additional comment.