

Accounting for Emissions Trading and Other Environmental Market Transactions: Emerging Opportunities for the FASB



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Executive Summary

The number and size of environmental markets in the United States has increased tremendously during the past decade, driven by both demand and regulation. Currently, more than 1,200 environmental markets are in operation in the United States. Carbon cap-and-trade systems operate in 10 states (these states account for 29 percent of U.S. GDP), and their impacts extend to thousands of manufacturing and utility firms. Firms in U.S. cap-and-trade systems spent more than \$4.2 billion in carbon allowance auctions in 2017. For many firms operating in cap-and-trade systems, emissions liabilities comprise 1-3 percent of the total financial liabilities on their balance sheet; this proportion is growing.

Despite the growing size and importance of these environmental markets, participants face several unique challenges related to accounting for these transactions, many of which can be addressed by the FASB. In the California cap-and-trade system, for example, firms must determine an accounting treatment and valuation method for free allowances provided by the California Air Resources Board, purchased allowances bought on the California Auction, allowances sold in third-party markets, and liabilities for compliance with the policy. Prices in these markets fluctuate significantly, so the recording and valuation method selected can have a material impact on financial statements. In the course of researching this topic, our organization conducted a survey across companies that purchase allowances within the California cap-and-trade system, representing 40 percent of all allowances bought and sold. We found that in the absence of guidance, companies are not consistent in their selection of methods to record and value allowances and liabilities on their balance sheets, and in many cases do not report them at all.

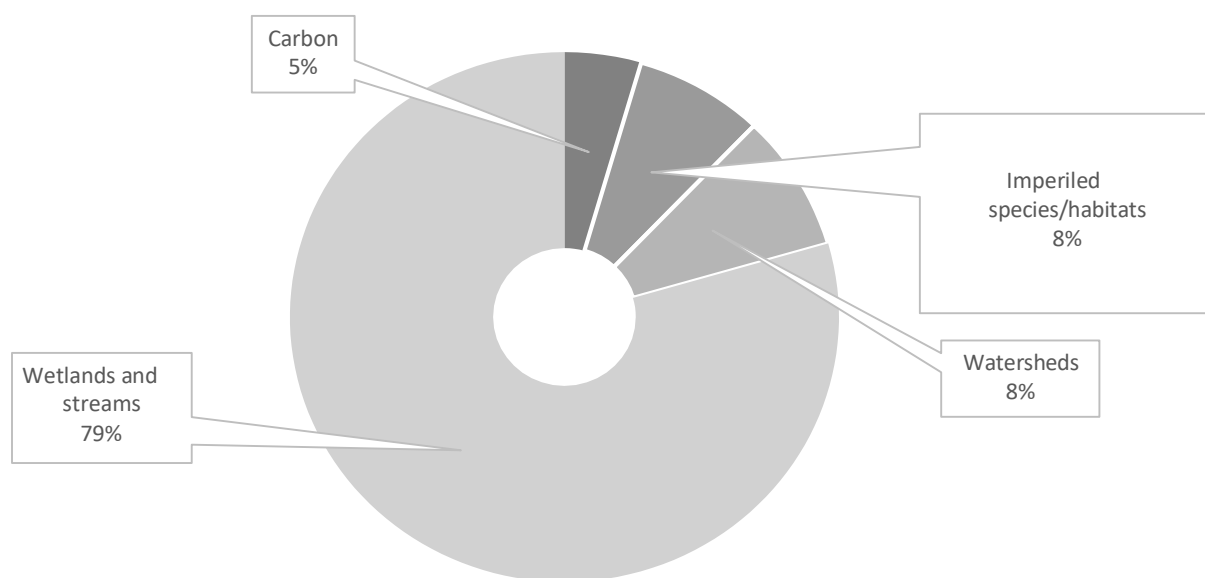
The FASB officially removed the topic of Emissions Trading Schemes from its agenda in 2014 without resolution. However, it appears that the FASB last actively deliberated on the topic in 2010, when the California cap-and-trade system and RGGI were still in their infancies. In light of the large and growing transactions associated with these markets and others, we would like to request that the FASB and/or Emerging Issues Task Force consider this topic in their upcoming deliberations, with the ultimate goal of issuing guidance. This will ultimately help to provide greater standardization for investors and other stakeholders.

Also, while the FASB (and GASB) have previously considered these issues in relation to carbon credits/emissions trading, it is reasonable to assume that similar issues will arise with other environmental markets due to their similar characteristics (infrastructure, rules, crediting systems etc.). For this reason, it is likely that broad accounting guidance could be developed for a range of new and established environmental markets. Due to the public-private nature of many of these markets, it may be appropriate to initiate a joint project between GASB and FASB. This would also support other efforts to increase disclosure related to climate and carbon, such as those of Moody's and the SEC.

Introduction

Environmental markets have emerged as an important tool for "internalizing" the externalities associated with the activities of governments and private companies. Participation in tradable emissions markets, voluntary carbon offsets, and renewable energy certificates has grown each year. Several countries and regional governments have developed "Cap-and-Trade" systems and created binding carbon emissions exchange systems. Cap-and-Trade systems represent the largest and most robust environmental markets in operation globally (see Figure 1).

Figure 1. Number of Environmental Markets in the US, By Type
Source: "EnviroAtlas" (n.d) US Environmental Protection Agency.
Retrieved from: <https://www.epa.gov/enviroatlas>



In the United States, the California Cap-and-Trade system sold more than \$4.2 billion in carbon allowances in 2017 with metric-ton prices steadily increasing each year.ⁱ The European Union (EU) carbon market, currently the largest in the world, has sold nearly 6 billion metric tons of carbon allowances in the past year.ⁱⁱ China has joined California, the European Union, South Korea, New Zealand, and Quebec in developing a Cap-and-Trade based carbon market system and is expected to surpass the EU to create the world's largest carbon allowance exchange.ⁱⁱⁱ

Outside of binding Cap-and-Trade policies, businesses are increasingly engaged in voluntary carbon marketplaces. Over 84 million metric tons of carbon offsets were purchased in "opt-in" market systems in 2016.^{iv} In the same year, globally more than 1,200 companies reported that they applied an internal carbon pricing system in their accounting practices.^v The continued growth of environmental markets has given rise to a greater need for accounting guidance for their associated transactions.

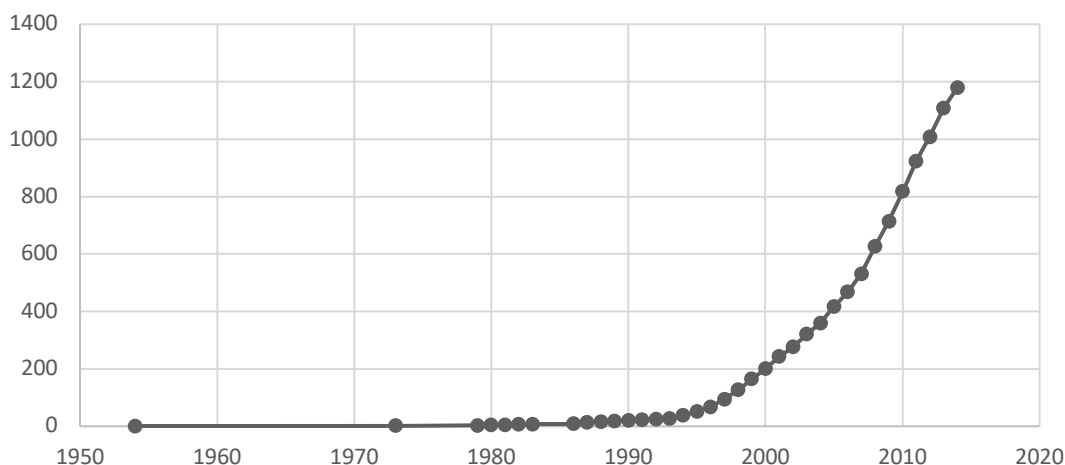
The International Accounting Standards Board (IASB) issued guidance on emissions rights accounting practices in 2003, but withdrew the report in 2005 following concerns of measurement and reporting mismatch^{vi}. In its 2005 statement, the IASB stated its intention to revise and reissue the report in light of the critiques. However, no subsequent report has been issued. The Financial Accounting Standards

Board (FASB) and the IASB deliberated on best practices and establishment of defined carbon accounting practices in multiple joint board meetings between 2007 and 2010.^{vii} Although it appears that multiple propositions to formalize and standardize carbon accounting standards were met with general support from the FASB, the topic was ultimately removed from FASB's agenda in 2014 without resolution.^{viii}

The Size and Scale of Environmental Markets in the US

There are more than 1,200 environmental markets currently operating in the United States, the majority of which are localized wetland mitigation banks (see Figure 2). The number of environmental markets has grown exponentially since their first introduction in the 1950's. The California Cap-and-Trade system and the East Coast-based Regional Greenhouse Gas Initiative (RGGI) represent the largest environmental markets in the United States in terms of transactions. Annual reports for many companies in the California Cap-and-trade system indicated that purchased allowances comprised 1 to 2 percent of their total reported liabilities. This percentage appears likely to increase significantly through 2030.^{ix}

Figure 2. Number of Environmental Markets in the US
Source: "EnviroAtlas" (n.d) US Environmental Protection Agency.
Retrieved from: <https://www.epa.gov/enviroatlas>



A component of Cap-and-Trade policy implementation is the development of an emissions allowance trading system or carbon market. Sectors regulated by Cap-and-Trade policies are allowed a finite quantity of greenhouse gas emissions annually. Emissions that exceed these "caps" must be covered via allowances purchased in a carbon market. Governmental entities determine the amount of emissions allowances to provide, and which sectors are required to participate in the system. Governmental entities also typically create and administer a marketplace in which allowances outside the cap are bought and sold, and oversee enforcement of the emissions regulations.^x Aside from these government interventions, Cap-and-Trade systems are intended to be driven by the free market. The goal of these policies is to provide firms with a financial incentive to reduce emissions and improve efficiency. Emissions trading systems have four components which firms must consider in their accounting practices: free allowances, purchased allowances, sold allowances, and non-offset emissions liabilities.^{xi}

- **Free Allowances** Firms operating in a Cap-and-Trade system receive free allowances (usually measured as metric tons of CO₂ emissions permitted per year) from government entities equal to all emissions under the cap. In all existing Cap-and-Trade markets the majority of a firm's emissions are covered by these free allowances.
- **Purchased Allowances** If a firm intends to emit in excess of their supply of free allowances, then they must purchase additional allowances in the carbon market. In most markets, these allowances represent 'permission' to generate the associated amount of pollution, and are not backed by comparable carbon sequestration investments. Both the California Cap-and-Trade and RGGI markets allow a small portion of the allowances to come in the form of "Carbon Offsets", which are backed by verified emissions reduction activities.
- **Sold Allowances** Although not universal to all Cap-and-Trade systems, many markets allow firms to sell unused allowances to other firms. These allowances may either be free allowances provided by the government that are unneeded, or purchased allowances that are unused. Typically, each allowance has an associated 'vintage year' or period in which it may be consumed, causing firms to sell unused offsets rather than conserve them for use in the next year.
- **Emission Liabilities** Firms record a liability if obligated to purchase emission allowances. If a firm exceeds their allotted allowances and does not purchase additional allowances they are liable for a fine.

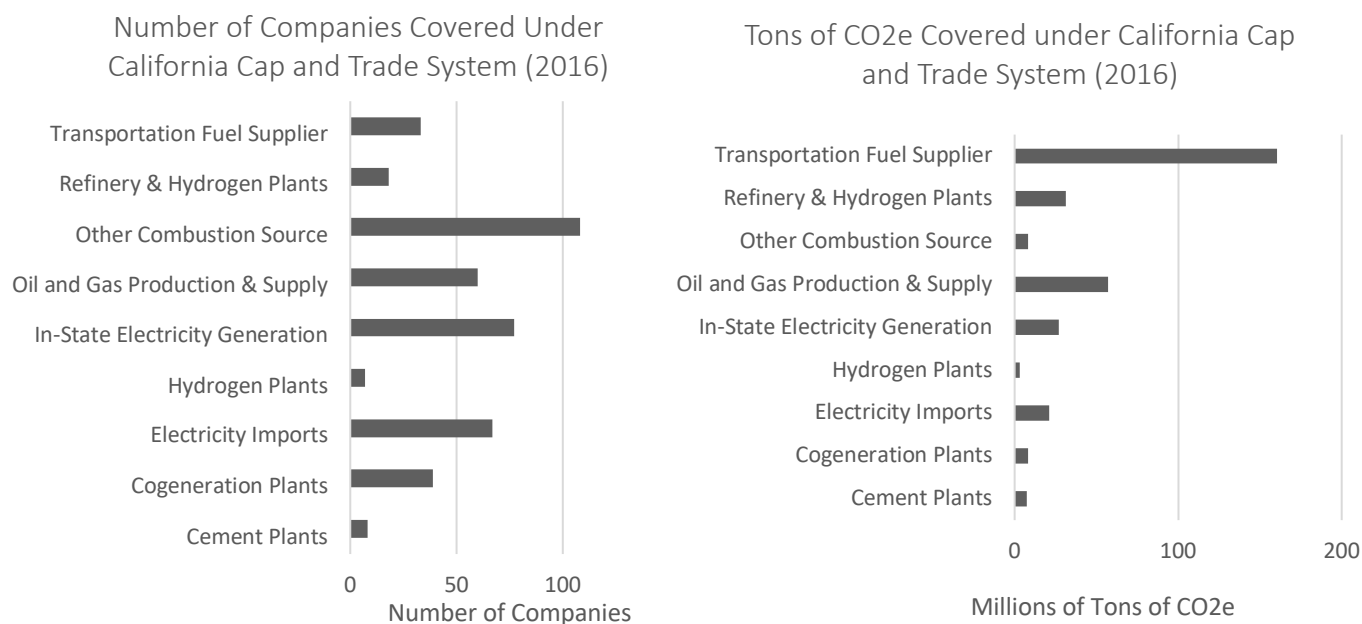
The California Cap-and-Trade System

California's Cap-and-Trade system was adopted in 2012, and since then has expanded to cover 85 percent of the state's emissions.^{xii} The initial free allowance cap set in 2012 represented approximately 90 percent of each participating firm's emissions. The amount of free allowances given to each firm per year decreases 3 percent annually in order to incentivize continued efficiency measures.^{xiii} Additional allowances are purchased via the State-run quarterly auction. Recent auctions have sold all available allowances.^{xiv}

California's Cap-and-Trade system has given rise to a secondary market wherein companies can sell allowances to other companies. The price of allowances in this secondary market is independent of auction pricing, but has remained very closely linked. In addition to purchasing allowances in the government auction or secondary market, firms may purchase verified carbon "offsets" to cover a portion of their obligation. Firms may use applicable carbon offsets (certified credits from projects that reduce or sequester emissions, such as forest restoration) to reduce the number of allowances they need to buy in the carbon market or secondary auction. Purchasing offsets is typically preferable for firms, as offsets tend to be less costly than government-provided allowances. However, the Cap-and-Trade policy states that a maximum of 8 percent of a firm's emissions obligations can be covered by offsets and the remainder must be covered through allowances.^{xv} The California market maintains an allowance price floor of \$10 (set in 2012 and increasing 5 percent annually).^{xvi} In recent years, the allowance price has remained fairly stable, between \$12 and \$15.^{xvii} In 2017, the California system was extended through 2030 by bipartisan vote in the state legislature.^{xviii}

Figure 3. Size and Scale of California Cap and Trade System

Source: “Annual Summary of 2016 Greenhouse Gas Emissions Data” (2016) California Air Resources Board



As of 2016, California’s cap and trade system covered hundreds of companies in several industries (see Figure 3), comprising more than 300 million tons of CO₂e emissions annually,^{xix} more than two thirds of California’s total annual emissions.^{xx}

The Regional Greenhouse Gas Initiative

Beginning in 2005, the Regional Greenhouse Gas Initiative (RGGI) has capped carbon emissions from fossil-fuel power plants and has been a significant contributor to the regional emissions decreases in the Northeast. The established cap decreases annually, but the rate of decline has been much more significant than the California market. The emissions cap was set at 165 million tons of CO₂ in 2012, and is scheduled to reach 77 million tons by 2020.^{xxi} The price of allowances sold in auctions in the RGGI system varies significantly from California auction results. RGGI allowances have fluctuated between \$2.50 and \$7 per ton. RGGI has \$2 price floor and a 'trigger price' of between \$4 and \$5. When the 'trigger price' is reached during an auction, an additional supply of allowances will be made available. The price of these varies significantly between years^{xxii} and between quarters, much more than in the California market. Since 2013, all available allowances have been sold at auctions.

Although more states are involved in the RGGI market, the California system covers between four and five times more emissions annually.^{xxiii}

Together, the RGGI and California cap-and-trade systems are connected with a significant proportion of total economic activity in the United States. The 10 states with active Cap-and-Trade policies account for 29 percent of all U.S. gross domestic product.

Other Environmental Markets

In addition to the Cap-and-Trade markets in California and the Northeast, there are many other environmental markets operating in the United States, both with and without governmental backing. Renewable Energy Certificates (RECs) have been bought and sold in the United States since 2001^{xxiv} and are a key component of many regional and organizational renewable energy commitments. Water Quality Trading markets, among the longest-standing environmental markets in the nation, allow firms to sell verified improvements in pollution runoff practices to other firms who operate and emit pollution near the same waterbody. In practice, these markets typically arise between utility companies and farmers. Farmers sell pollution reduction credits (gained through verified improvement to fertilizer management, for instance) to utility companies so that utilities can continue regular operations without a pollution fine or penalty.^{xxv} Wetland mitigation markets function in largely the same way. Wetland mitigation markets trade credits between wetlands restoration projects and land developers. Developers who wish to convert a wetland parcel to developed land may purchase mitigation credits, which finance wetland restoration projects elsewhere.^{xxvi} Wetland mitigation markets sell an estimated \$2.2 billion in wetlands credits per year, making the wetland mitigation market second only to the California cap-and-trade system in revenue.^{xxvii} Wetland markets bankers have sought clarity on accounting and tax standard applications for several years, although no such clarification has been issued to date.^{xxviii}

Related Initiatives

Environmental markets are a component of a larger trend to include environmental impacts and risks in financial practices. Industries and governments are implementing strategies to quantify and standardize environmental impacts. For example:

- In 2010, the U.S. Securities and Exchange Commission (SEC) issued a guidance that all publicly traded companies disclose any financially relevant climate change impacts in their business. Most often these disclosed impacts are compliance costs of emissions regulation programs and operational risks associated with the projected impacts of climate change.^{xxix}
- Many publicly traded companies are now including environmental performance in their investor statements. The majority of stock trades (70%) occur in stock markets that require some measure of environmental, social, or governance-based transparency reporting. This represents a 25 percent increase from 2014.^{xxx}
- In November 2017, Moody's issued a report stating that climate change impacts, and the cost of mitigation of these risks will be included in credit ratings for states and municipalities. Areas with high risk of damages due to rising sea levels or extreme weather events will have the liability associated with these risks included in their credit rating.^{xxxi}

Accounting for Carbon Market Transactions: Theory and Practice

In the absence of specific accounting guidance, firms have adopted a variety practices to account for these allowances.

A. Accounting for Free Allowances

The greatest diversity in carbon accounting in the United States occurs around the treatment of *free allowances*. In the California Cap-and-Trade system, companies receive free allowances annually to cover the majority of their emissions. Existing accounting practices vary significantly in how these free allowances are recorded. There are two central unresolved challenges in free allowance carbon accounting: 1) whether to record free carbon allowances as Intangible Assets or Inventory; and, 2) whether to value allowances at fair value, nominal value, or as government grants. The International Financial Reporting Interpretations Committee (IFRIC), the Autorité des normes comptables (ANC), and European Financial Reporting Advisory Group (EFRAG) have issued conflicting recommendations on the appropriate carbon accounting systems in Cap-and-Trade systems.

Intangible Assets vs. Inventory

Firms typically account for free allowances as either Intangible Assets or as Inventory. The ANC support the accounting for free allowances as Inventory^{xxxii}, and the IFRIC support accounting for free allowances as Intangible Assets, although the specific accounting recommendation on this practice has been withdrawn.^{xxxiii} With the exception of these two accounting practice organizations, few accounting boards have issued recommendations on this issue.

Intangible Assets are defined as non-physical assets that have a lifespan of more than one year, and typically appear on a firm's balance sheet. Examples include leases and contracts, intellectual property, and software licenses. Intangible Assets are considered to be long-term assets. Property that is to be sold or consumed during ordinary business is recorded as Inventory. Assets that are consumed in the process of production or that are purchased and then resold are traditionally recorded as inventory. Inventory Assets are usually recorded as short-term assets. Because free emissions allowances do not fully align with the characteristics of either intangible assets or inventory, EFRAG has recommended that a new method of classification be developed to accommodate these allowances.^{xxxiv}

Valuation at Fair Value vs. Nominal Value vs. Weighted Average Value

In addition to uncertainty around categorizing free allowances, there is significant variation in the valuation practices of these allowances. Free allowances may be recorded at fair value, nominal value, or as a government grant (and recorded at their value at the time of issuance).

Fair valuation reflects the price that could be attained for freely gained allowances if sold. This is recorded as equal to the price of allowances in auctions or exchanges in the Cap-and-Trade systems. Fair value recording was recommended in the initial statement released by IFRIC.^{xxxv} Nominal values reflect the price assigned to the allowances when they were issued. In the case of free allowances, a nominal valuation would estimate the value of these allowances as \$0. Nominal value recording was recommended in the report released by the ANC and is commonly practiced in the European Union.^{xxxvi} Alternatively, allowances are frequently recorded at weighted cost average, supported by the Federal Energy Regulatory Commission (FERC). Weighted cost average determines value using the following formula:

$$\text{Weighted Cost Average} = \frac{\Sigma(\text{Total Expense of Units Purchased During Period})}{\Sigma(\text{Total Units Purchased During Period})}$$

In this case, because the price paid for these allowances is zero, the nominal value and weighted cost average methods yield the same value for free allowances. As shown in Figure 4 the fair value method can result in a vastly different value.

Figure 4. Free Allowance Valuation difference in Fair Value, Nominal Value, and Weighted Cost Average Systems

Free Allowance Valuation Method Comparison				
		Fair Value	Nominal Value (at cost)	Weighted Cost Average
Q1	Price Paid For Allowances	\$0	\$0	\$0
	Fair Value of Allowances	\$10.5	\$10.5	\$10.5
	Number of Free Allowances Allocated	10,000	10,000	10,000
	Allowances Consumed During Quarter	3,000	3,000	3,000
	Valuation of Free Allowances Remaining at End of Quarter	\$73,500	\$0	\$0
Q2	Price Paid For Allowances	\$0	\$0	\$0
	Fair Value of Allowances	\$11.5	\$11.5	\$11.5
	Number of Free Allowances Remaining	7,000	7,000	7,000
	Allowances Consumed During Quarter	3,000	3,000	3,000
	Valuation of Free Allowances Remaining at End of Quarter	\$46,000	\$0	\$0

B. Accounting for Purchased and Sold Allowances

Allowances that are purchased via auction or secondary market or allowances that are sold on the secondary market are considered to be tradeable allowances. Accounting for tradeable allowances carries similar uncertainty to that of free allowances. Both the inventory and intangible asset classifications remain viable for the tradeable allowances. The ANC retains the position that tradeable allowances should be recorded as inventory.^{xxxvii} Recording tradeable allowances as inventory may be challenging in the RGGI and California markets as allowances can be purchased for future “vintage years.” In the RGGI market, allowances for the 2020 vintage year may be bought in 2017. Because inventory assets are recorded in the short-term, these future allowances would not appear as inventory until the year in which they can be used. This creates a discrepancy between the years the assets are purchased and the year they are recorded as a valued asset. The European Cap-and-Trade system in which the ANC operates does that have the same vintage year system and thus may not have the same

concern.^{xxxviii} As demonstrated in Figure 5, the nominal valuation and government grant issuance value of tradeable allowances align, but may potentially vary significantly from the fair value if the market price for allowances has not remained stable.

Figure 5. Purchased and Sold Allowance Comparison in Fair Value, Nominal Value and Weighted Cost Average Systems

Purchased and Sold Allowance Valuation Method Comparison				
		Fair Value	Nominal Value (at cost)	Weighted Cost Average
Q1	Price Paid For Allowances	\$42,000	\$42,000	\$42,000
	Market Value of Allowances	\$10.5	\$10.5	\$10.5
	Number Allowances Purchased	4,000	4,000	4,000
	Allowances Consumed During Quarter	3,000	3,000	3,000
	Balance Carrying Over to Next Quarter	1000	1000	1000
	Valuation of Allowances Carrying Over to Next Quarter	\$10,500	\$10,500	\$10,500
Q2	Price Paid For Allowances	\$40,250	\$40,250	\$40,250
	Fair Value of Allowances	\$11.5	\$11.5	\$11.5
	Number of Allowances Purchased	3500	3500	3500
	Total Balance of Allowances (including Carryover from Q1)	4500	4500	4500
	Allowances Consumed During Quarter	3,000	3,000	3,000
	Balance Carrying Over to Next Quarter	1500	1500	1500
	Valuation of Free Allowances Remaining at End of Quarter	\$17,250¹	\$16,250²	\$16,450³

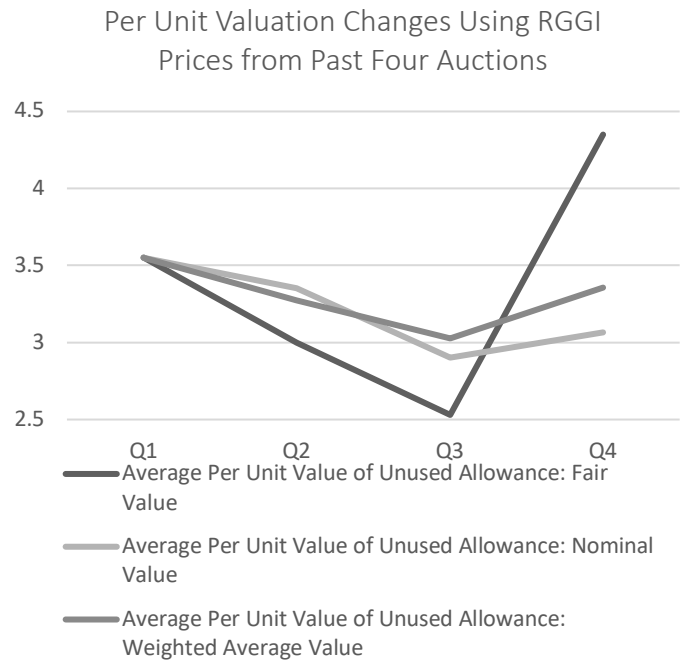
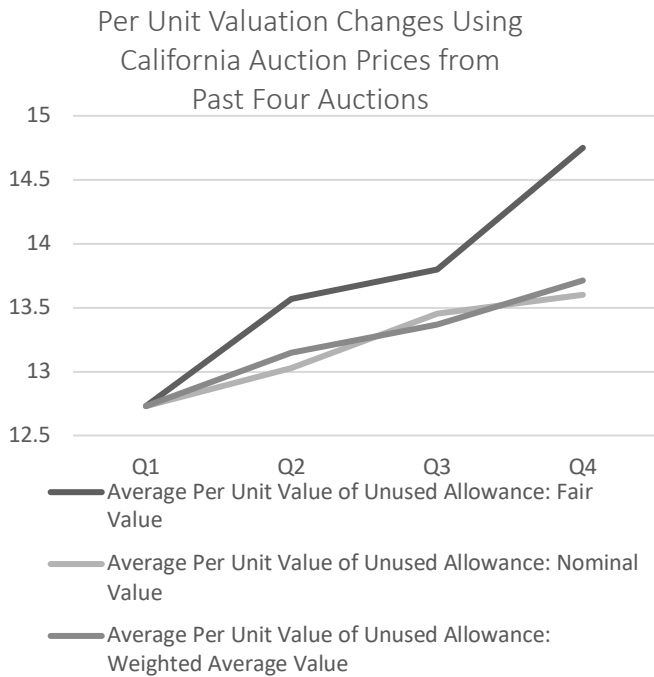
Based on prices paid in the last four California^{xxxix} and RGGI^{xl} allowance auctions, Figure 6 compares the per allowance average prices of remaining inventory using each valuation method. Although nominal value and weighted average value calculations are similar, they are not identical when the allowances used per quarter are not consistent. Fair valuation is far more responsive to volatility than nominal value and weighted average value measures. In a 2010 joint FASB/IASB board meeting, board members tentatively decided that emissions should be recorded at fair value.

Figure 6. Per Unit Value Differences in RGGI and California markets using Fair Value, Nominal Value, and Weighted Average Values

¹ 1500 allowances times the fair price per allowance (\$11.5)

² 1000 allowances purchased at \$10.5 per allowance (\$10,500) plus 500 allowances purchased at \$11.5 per allowance (\$5,750) = 16,250

³ Total expense on units purchased in this period (\$42,000 + \$40,250) divided by the total number of units purchased (4000+3500) yields a per unit weighted cost average of \$10.9666. \$10.9666 multiplied by 1500 = \$16,450.



Period	Price Paid Per Allowance (California)	Price Paid Per Allowance (RGGI)	Allowances Purchased	Allowances Used	Unused Allowances
Q1	\$12.73	\$3.55	1000	955	45
Q2	\$13.57	\$3.00	1000	975	25
Q3	\$13.8	\$2.53	1000	915	85
Q4	\$14.75	\$4.35	1000	980	20

C. Liability Recording

In conjunction with recording the value of carbon allowances, companies must consider how to record the liability associated with the emission of pollutants in a Cap-and-Trade system. There are three unresolved issues surrounding the recording of carbon allowances liabilities: 1) whether to record a liability at the time when the pollution is emitted or when the contractual agreement is made to limit pollution; 2) whether to record a liability for emissions that are offset by free allowances or to only record a liability for emissions over the cap; and, 3) whether to value the liabilities at Fair Value, Nominal Value, or Weighted Cost Average.

Recorded a Liability for All Emissions vs. Recorded for Only Emissions over Cap
 Companies may choose to record a liability for all pollution emitted, or only to record a liability for pollution emitted above the determined cap. Recording only liabilities over the cap will register a liability for all emissions that must be covered by a purchased allowance. IFRIC 3^{xli} recommends recording only emissions over the cap as liabilities. Most, but not all, companies use this method.^{xlii} If free allowances are valued at fair value and only emissions over the cap are valued, then companies will record a significant “day one gain” from the allocation of these allowances.

Recorded Liability at Time of Emission vs. At Time of Entrance into Contract

Companies may choose to record a liability at the time they are emitted or to record a liability when a contract is issued (this typically occurs when the government established an annual cap for the organization and provides some portion of free allowances). Companies who record a liability at the time of emissions recognize the emission of pollution as the obligating event, whereas companies recording a liability at the time of contract entry typically record an obligating event in the first quarter of each year.^{xliii} There is little guidance on this area, and organizational practices appear to be divided on this topic.^{xliiv} The time of liability is impactful with respect to subsequent category — method of liability valuation.

Valued at Fair Value vs. Nominal Value vs. Weighted Cost Average

As with the valuation of allowances assets, emissions liabilities can be valued at fair value, nominal value (historical cost average) or weighted cost average. Companies traditionally value allowance assets and emissions liabilities using the same method; however, even when using the same practice, mismatches can occur in the nominal and weighted cost average systems. Figure 7 demonstrates a scenario where a mismatch can occur using the nominal valuation method. In this scenario, the company records a liability for emissions at time of receipt of free allowances, rather than as pollution is emitted. Weighted cost average will yield the same mismatch in this scenario. In order to avoid this mismatch, the company may:

- 1) use fair valuation for both allowances and liabilities, or
- 2) register a liability as pollution is emitted.

Figure 7. Valuation Mismatches Using Nominal Valuation

Quarter	Market Price of Carbon	Pollution Emitted	Free Allowances (Amount Used During Quarter): Number Remaining	Valuation of Allowances Purchased in This Period	Valuation of Emissions Liability
Q1	\$12.73	1000	(1000): 1500		(1500): \$19,095
Q2	\$13.57	1000	(1000): 500		
Q3	\$13.8	1000	(500): 0	(500): \$6,900	
Q4	\$14.75	1000	0	(1000): \$14,750	
			Total	\$21,650	(\$19,095)
			Mismatch	\$2,555	

This scenario yields a mismatch of \$2,555 (or 12 percent of the total value of purchased allowances). Weighted cost average valuation will yield the same mismatch in this scenario. In order to avoid this mismatch, the company may: 1) use fair valuation for both allowances and liabilities, or 2) register a liability as pollution is emitted. If an organization chooses to register a liability as pollution is emitted, there is still a significant potential for year-end mismatch if the organization purchases allowances in a period other than the one in which they are emitted. As auction prices of carbon vary throughout the year, a company may “stock up” on allowances when the price is favorable, thus resulting in a mismatch again.

Results from a Survey of Accounting Practices in the Regional Greenhouse Gas Initiative (2009)

A 2009 survey of large companies that participated in cap-and-trade markets found significant variation in accounting practices. Companies that participated in the survey were largely enrolled in the RGGI market, as this research predated the development of the California Cap-and-Trade system. Respondents were evenly split between recording emissions allowances as Intangible Assets and recording them as Inventory. Within both Intangible Asset and Inventory recording models, there was broad diversity in valuation methods used. Most companies recorded the value of the credits and allowances at cost. Some measured the value as a weighted average, and a minority valued these credits at fair market value. Most companies surveyed did not record any obligation or liability from emissions until the level of emissions produced exceeded the designated cap.

Results from a Survey of Accounting Practices in the California Cap-and-Trade System (2018)

In the course of research for this report, a survey was conducted of companies participating the California Cap-and-trade system. This survey matched the methodology used by Ernst & Young to conduct its 2009 survey of accounting practices within cap-and-trade system, but focused exclusively on companies in the California market, as they were not included in the Ernst & Young study, and now comprise the largest segment of U.S. environmental market share. This survey focused on the largest emitters in the California system, and responses from 15 companies were received, representing 38 percent of all emissions covered under the California system.

Free Allowances

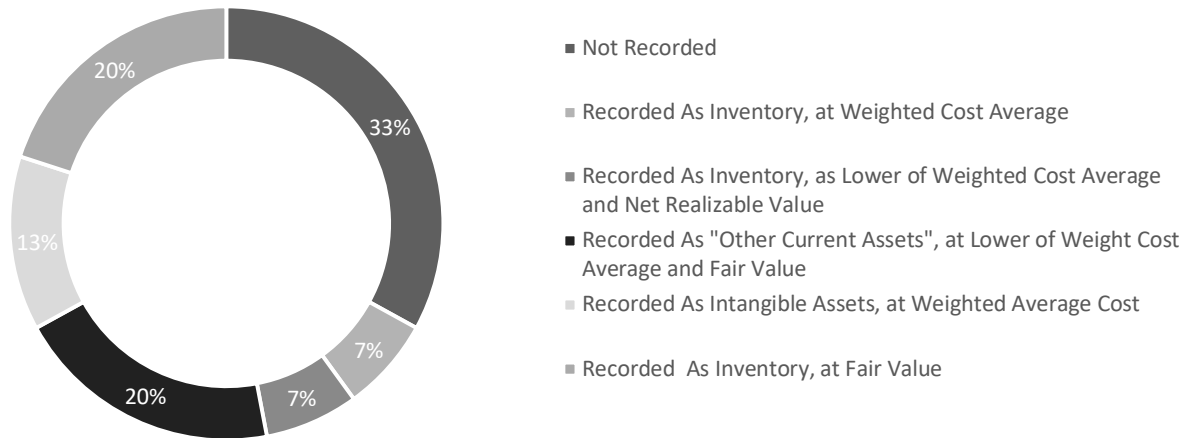
The majority of companies (61 percent) reported not recording the free allowances received under the Cap-and-trade system; 39 percent reported that all allowances in California system are recorded at weighted average cost or nominal value, and thus free allowances were assigned a value of \$0. No companies explicitly reported the quantity of free allowances received in their annual reports or SEC Filings.

Purchased Allowances

There was a wide variety of purchased allowance recording methods reported (see Figure 8): 33 percent of companies reported having no purchased allowances at this time, or having a small enough amount that they were not included or itemized on their balance sheet; 13 percent of companies reported recording purchased allowances as inventory at Weighted Cost Average; and, 7 percent recorded these allowances as inventory at the lower of Weight Cost Average and Net Realizable Value⁴. Another 7 percent of respondents recorded purchased allowances as inventory, at fair value; 20 percent of companies recorded purchased allowances as intangible assets, at fair value; and, 20 percent recorded purchased allowances as “other current assets” and valued them at the lower of weighted average cost and fair value.

⁴ Net Realizable value is akin to Fair Value, although the costs of making the transaction, if significant, are excluded in the Net Realizable value

Figure 8. Purchased Allowance Recording Methods



Emissions Liability Recording

Emissions Liability recording practices were equally varied: 53 percent of companies did not record emission liabilities, either because they had no emissions above the cap or because their allowance recording practices did not include liability recording. When emissions are generated that exceed both the cap and the purchased allowances owned by the company, the remainder (47 percent) of companies reported recording a liability at fair value equal to the additional cost of compliance. Typically, this cost includes purchasing additional allowances, and paying a fine.

Qualitative Results

Many companies have experienced very significant year-over-year cap-and-trade allowances expenditure increases. As the number of free allowances declines each year, and the market value of the allowances increases, companies surveyed reported a 13-39 percent increase in California cap-and-trade allowance expenditure from 2016 to 2017. The number of free allowances given in this market will continue to decline, indicating that expenditures will continue to increase. Annual reports for many companies in the California cap-and-trade system indicated that purchased allowances comprised between 1-2 percent of their total reported liabilities. This percentage appears likely to increase significantly through 2030.^{xiv}

Acknowledgements

This report was researched and developed by Rowan Schmidt and Jordan Wildish of Earth Economics. Guidance was provided by Ed Harrington, the former General Manager of the San Francisco Public Utilities Commission. The authors are responsible for the content of this report.

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