

# Emissions trading systems: The opportunities ahead

The costs and effects of carbon are a growing global concern. Large emitters now are faced with the challenge of how to price carbon and account for its impact.



# Foreword

In November 2021, nearly 200 countries will meet in Glasgow for the 26th UN Climate Change Conference of the Parties, or COP26, to once again assess the effects of our warming planet on people's livelihoods and the measures needed to adapt to and mitigate climate change. The reduction of carbon emissions and how to reach net zero is the agenda. Many think that the progress since the 2015 Paris Agreement was signed has been too little and too slow.

When emission targets were first set after the adoption of the Kyoto Protocol in 2005, the European Union's Emissions Trading System (EU ETS) came into effect, and today accounts for 40% of greenhouse gas emissions in Europe. The EU ETS covers Europe's biggest emitters—including power plants, steel manufacturers, cement makers and domestic aviation—and has proposed expanding to cover road transport and maritime. This year, the number of emission credits issued by the EU ETS will decline further, which is likely to drive the price of carbon higher and force more ambitious reduction targets on the companies in the system.

The EU ETS has had significant success. Its cap-and-trade model resulted in a 35% drop in carbon emissions in Europe from 2005–19, despite a fluctuating price for carbon that saw it drop as low as zero in 2008. Emissions reductions have accelerated over time, falling 9.1% in 2019 and a further 12% in 2020.

One continuing concern, however, is the lack of international financial reporting standards outlining how carbon allowances should be recorded in corporate financial statements. This is more relevant today because of the increased need for transparency and accountability when it comes to adopting measures that will get us to net zero.

Because we believe the EU ETS can be used as a template for other countries and regions, it is more important than ever that companies and their investors recognise the value of their assets in a way that is comparable, particularly as the price of carbon is volatile. Carbon recently hit a record high of more than €60 per tonne, and the price is expected to rise further over time.

This report is in two parts. The first looks at the important role the EU ETS plays on the way to achieving global net zero. The second part reports and comments on the results of a survey of 25 large companies operating in the EU ETS today. It is a follow-up to a survey we conducted in 2007 about how companies are using the system. It reviews the accounting practices that companies employ to ensure that their balance sheets adequately reflect their carbon credits and, in so doing, their asset values. It also lays out examples of how credits can be accounted for in a changing world.

We hope that this analysis proves useful to business leaders who are considering or who have established their organisation's path to net zero.



**Henry Daubeney**  
Global Chief Accountant  
and Head of Reporting  
PricewaterhouseCoopers  
International Limited

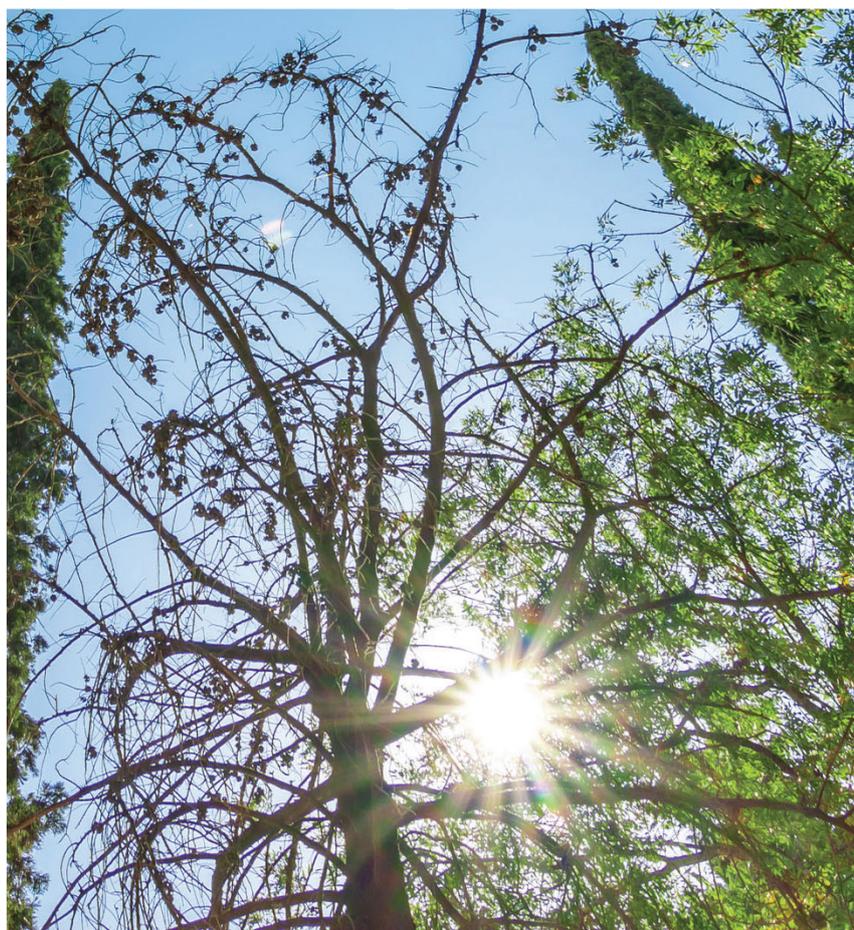


**Dirk Forrister**  
President & CEO  
International Emissions  
Trading Association (IETA)

# Contents

- 04 Executive summary
- 06 Key survey findings
- 08 Part one: Accounting for carbon emissions
- 15 Part two: Survey results
- 20 Conclusion
- 21 Accounting approaches for the EU ETS and equivalent emissions trading schemes—PwC view
- 26 Appendix: Survey methodology
- 27 Contacts

# Executive summary





**If the EU ETS is to be used as a template for carbon markets around the world, it will be necessary to have an internationally recognised way to account for carbon allowances. This will give investors and stakeholders clarity on how companies are faring on their path to net zero.**

The European Union's Emissions Trading System (EU ETS) was a pioneering programme when it launched in 2005, the first in the world to attempt to introduce a compulsory carbon market to reduce emissions in high-intensity carbon-emitting industries. In the ensuing 16 years, much has changed as climate change has risen to the top of the global agenda. There are now a number of exchanges for trading carbon emission certificates globally: three in Europe, two in the US, and one each in New Zealand and South Korea. And more countries, industries and companies have adopted net zero targets.

Companies participating in the EU ETS already account for 40% of greenhouse gas emissions in Europe, and the European Commission has proposed expanding emissions trading to other sectors, including road transport and shipping. Given the importance of the EU ETS—it has led to a reduction of 35% in emissions—and history, other countries are looking to it to learn from its experiences. As it continues to develop, the EU ETS is often seen as a template for a coordinated global approach to carbon pricing.

The EU ETS sets targets for emissions reduction and is now in its fourth phase, which will apply for the period 2021–30. The 2030 target for greenhouse gas emissions will require the sectors covered to reduce emissions by 43%, compared with 2005 levels. Recent proposals from the European Commission have suggested increasing the target to 61%. There will also be a reduction in the number of allowances issued annually, and in turn, the price of carbon may continue to rise.

In the 16 years since the EU ETS launched, however, no international financial reporting standard has been agreed to address specifically how carbon allowances should be accounted for in financial statements. This lack of standardisation makes it hard for businesses to present themselves to the market, and for the market to understand the financial consequences of emissions and the related credits on companies' balance sheets. This was the single biggest criticism of the system by the respondents to the survey we conducted in 2007 and to our latest survey, conducted from September 2020 to January 2021.

In the 2007 survey, the firms reported using six different ways to account for their carbon allowances. In this latest survey (see part two of this report for full results), the 25 respondents used four different accounting methods for allowances on the statement of financial position and how they are treated on the income statement.

The lack of uniform, generally accepted principles for carbon-allowance accounting means that companies have to select from a diverse array of possibilities. There is no clear direction on the best options or comparability with their peers. Investment, transaction and operational decisions may be delayed or hamstrung by this lack of clear accounting treatment.

If the EU ETS is to be used as a template for carbon markets around the world, it will be necessary to have an internationally recognised way to account for carbon allowances. This will give investors and stakeholders clarity on how companies are faring on their path to net zero.

In this report, we argue that accounting standards are necessary sooner rather than later. In April 2021, the EU introduced its [Corporate Sustainability Reporting Directive](#), which will introduce reporting standards from October 2022 on emissions and which covers all large companies and all companies registered on listed markets. Both investors and external stakeholders are asking for more and better information about what companies are doing to reduce their carbon emissions. This is no longer just an issue for financial reporting. Rather, it should inform corporate strategy. Standardised accounting helps to ensure a level playing field.

In the second part of this report, we highlight best-practice accounting for ETS, as it now stands, giving specific examples based on PwC's experience.

# Key survey findings

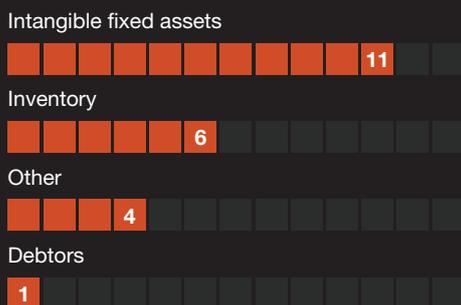
The survey includes responses from 25 companies, in industries including oil and gas, cement, steel, chemicals and aviation.<sup>1</sup> The survey and findings are predominantly based on the International Financial Reporting Standards (IFRS).

## Too many different reporting methods

Among the 25 respondents, four different ways were used to account for granted and purchased allowances and three different ways to value granted allowances.

### Exhibit 1: Balance sheet recognition for granted allowances

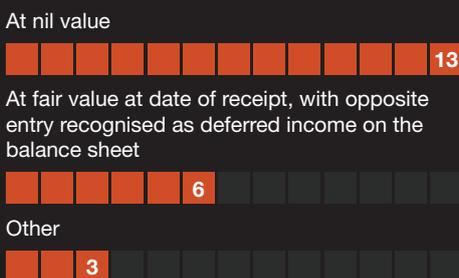
Question: Where are granted allowances initially recognised on the balance sheet?



Source: PwC and IETA survey, September 2020 to January 2021

### Exhibit 2: Valuing allowances

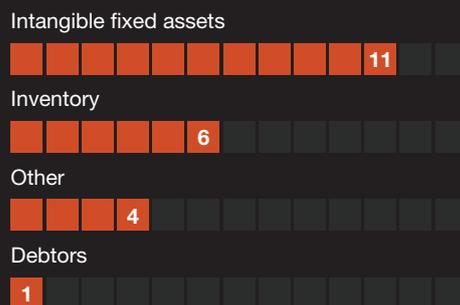
Question: At what value are granted allowances initially recognised on the balance sheet?



Source: PwC and IETA survey, September 2020 to January 2021

### Exhibit 3: Balance sheet recording for purchased allowances

Question: Where are purchased allowances recorded on the balance sheet?

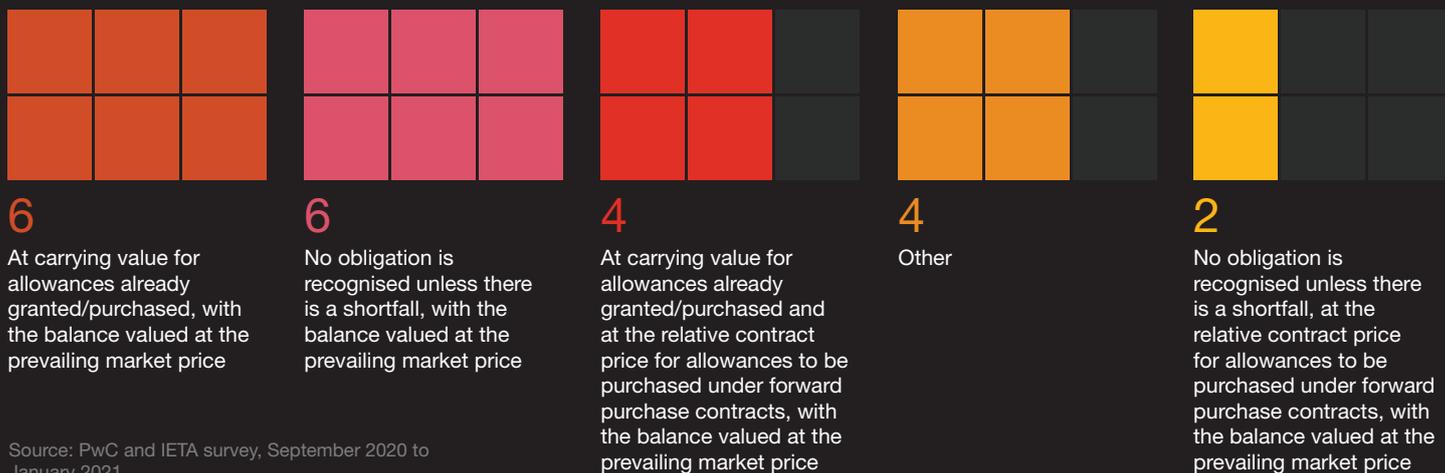


Source: PwC and IETA survey, September 2020 to January 2021

Companies used five different ways to measure the allowance:

### Exhibit 4: Initial measurements of emission allowances

Question: How is the obligation for emissions initially measured?



Source: PwC and IETA survey, September 2020 to January 2021

<sup>1</sup> Twenty-five companies were included in the survey; three of the respondents indicated that their company uses EU ETS allowances only for trading purposes, and therefore were excluded from the main analysis.

And entered them on four different lines on the income statement:

**Exhibit 5: Recording sales of granted allowances on the income statement**



Source: PwC and IETA survey, September 2020 to January 2021

These different reporting methods are causing nearly half of respondents to be concerned about the lack of standardised reporting and its effects.

**45%**

of respondents raised concerns that there is no single accounting treatment for emissions credits, which leads to a lack of comparability in emissions accounting.



**Lack of consistent accounting guidance in this area is causing significant diversity in practice.**

Compliance officer, large energy company

# Accounting for carbon emissions



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基於保安理由，所有進出本廠之車輛及人員必須接受檢查。  
For security reasons, all vehicles entering and leaving the Plant are subject to search.  
Thank you for your cooperation!

警告 - Warning  
嚴禁在廠區內停車  
嚴禁在廠區內飲酒

WORKING AREA  
INDUSTRIAL PLANT  
PROHIBITED AREA



Climate change is arguably the defining challenge of our age. In November 2021, representatives from nearly every country will meet in Glasgow for the 26th UN Climate Change Conference of the Parties (COP26)—each with a plan in hand for how they will cut carbon emissions. One key aspect of many of those strategies is likely to be a national or regional emissions trading system, which governments are increasingly realising can [change polluting behaviour](#), spur innovation and help the global community respond to the climate crisis.<sup>2</sup>

In the first half of 2021, both the United States and China ramped up their commitments to combating climate change. President Joseph Biden [pledged](#) that the US would reach net zero emissions by 2050. That announcement came a few months after President Xi Jinping [said](#) China would accelerate its own emissions reduction targets, bringing the world's two biggest emitters into greater alignment with the European Union's [ambitious climate goals](#).

The EU's longstanding target of reducing emissions in line with the goals of the Paris Agreement has been underpinned by the success of the EU ETS, which currently covers 40% of the bloc's total greenhouse gas emissions. That figure could double over the next decade as emissions trading expands to new sectors. And as the US, China and other countries begin to develop new trading schemes or integrate existing ones into a broader global system, the EU ETS is well-placed to act as a template.

One key concern, however, remains the lack of standardised accounting for carbon, something that has not changed over the life of the EU ETS. PwC and the International Emissions Trading Association (IETA) asked 25 large companies in Europe—a representative sample of the continent's biggest emitters, in industries including steel, cement, petrochemicals and power—how the mechanics of reporting within the system were working. It was a follow-up to a similar survey conducted in 2007.

We found that while the carbon market has changed, there are still concerns about how companies account for their emissions credits. Half the respondents consider the allowances an intangible fixed asset; one-quarter consider them inventory. In fact, the companies' approaches differ on nearly every aspect of how emissions and related compliance obligations are measured, valued and recorded on the balance sheet to the extent that one would be hard-pressed to assume that they were party to the same carbon trading system (see part two for how this affects reporting).

Companies want consistency because investors demand it, and standardisation will gain even greater importance as more companies join the EU ETS. Consistency matters to leaders far beyond the compliance and finance departments, given the growing importance of carbon as a commodity.

An [environmental, social and governance \(ESG\) revolution is underway](#), influencing how companies define their strategy and reporting. ESG is top of mind in boardrooms, and C-suite leaders need to understand the effects of carbon emissions and carbon pricing on their businesses. Accounting for carbon will become a key metric and could influence important corporate decisions. ESG is leading to significant business transformations, and not just in businesses that are carbon intensive. In response to calls for greater transparency about greenhouse gas emissions, companies must be able to communicate clearly and unambiguously exactly what they are doing to cut emissions and how those actions affect their bottom line.

The global community needs to come together to give emissions trading systems, like the EU ETS, a firm foundation on which to help companies make and meet their carbon reduction targets. There have been efforts to do this in the past, but so far they have failed.



## Background

The ETS is the central pillar of the EU’s ambitious climate strategy and was the world’s first major greenhouse gas trading scheme when it launched in 2005. It now limits emissions from around 10,000 power and manufacturing facilities—including steel and other metalworks, and the chemicals, glass and paper industries—along with airlines that operate within the bloc, which buy and sell carbon allowances within the cap-and-trade system.

Such systems create a legally binding environmental result and target for emissions reductions. The EU sets a cap on the total amount of emissions that companies in the system

can produce. At the end of each year, companies are obliged to surrender allowances representing their emissions. Companies that have decarbonised faster than expected can keep their spare allowances for the future or sell them to other companies.

The ETS cap on emissions has shrunk over time to force reductions and will continue to do so as we near 2050. That has driven up the price of carbon credits by more than 600% since 2018, and the price of carbon is only expected to rise further (see Exhibit 6).

### Exhibit 6: Carbon prices are rising

— ICE Front—December EUA settlement price



Source: ICE Index



With an eye on carbon neutrality by 2050 and a new target of a 55% net reduction in emissions by 2030, the European Commission has proposed revising and expanding the scope of the ETS to include industries such as road transport and shipping. The commission also aims to increase the pace of annual cap reductions. That means as the number of installations covered in the market expands significantly, attempts are being made to strengthen and tighten the market. So as the EU ETS enters its fourth phase this year, its goal is that the overall number of emission allowances will decline at an annual rate of 2.2% from 2021 onwards, compared with 1.74% currently.

### A global conversation

These moves reflect the urgency of the global conversation around climate change. Climate activists have become more vocal and more influential, and many consumers now demand a level of climate consciousness from the companies they patronise. [A PwC survey](#) in April 2021 in the US of more than 5,000 consumers, for example, found that 80% said they were more likely to buy from a company that stands up for the environment.<sup>3</sup>

Investors also need to understand how exposed their portfolios are to emissions and their potential costs. We believe boards should have a responsibility to ensure consistency between the corporate narrative about disclosures of climate risks and company financial statements.

The EU [Corporate Sustainability Reporting Directive \(CSRD\)](#), a revision to the [Non-Financial Reporting Directive \(NFRD\)](#), specifically targets companies that “often omit information that investors and other stakeholders think is important.” It will introduce an EU-wide limited assurance requirement for reported sustainability information from 1 January 2023. Although the non-financial reporting standards are not yet agreed upon, in a reflection of how seriously policymakers are about standardisation, the European Commission [is](#)



[aiming to align](#) its non-financial reporting requirements with global norms, including those established by the International Sustainability Standards Board (ISSB).

The EU has also proposed expanding the number of companies that must adhere to the CSRD (compared to the NFRD) from 11,000 to 50,000, including all listed and unlisted large companies. Listed small and medium-sized enterprises would be held to simpler standards but are being brought in because “the transition to a sustainable economy is likely to mean that collecting and sharing sustainability information becomes common business practice for companies of all sizes.”

That combination of reputational and regulatory drivers is changing the business imperative around climate change. Companies must now curb their polluting practices for the sake of both their brand and bottom line. Policymakers are pushing in the same direction, and that is likely to lead to the introduction and integration of even more emissions trading systems.

### EU ETS as global leader

The 2015 Paris Agreement set the stage for an even greater proliferation of international carbon markets, and European policymakers have taken a hands-on approach to their development. As a founding member of the [International Carbon Action Partnership](#), the EU is also working with roughly 17 countries in preparing their own systems.

Given its long history, the EU ETS sees itself as a model for global carbon trading. Indeed, national and subnational schemes that follow its lead are in development or already operating in Canada, China, Japan, New Zealand, South Korea, the UK and the US. Last year, Switzerland established a link with the EU system. And Russia [will launch a pilot carbon-trading programme](#) in the far eastern island region of Sakhalin in the near future, with a view to possibly expanding it nationwide.

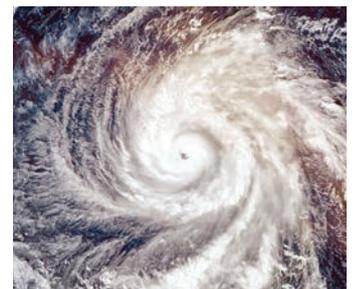
Ideally, long-term cooperation will lead to the development of systems that allow for a greater degree of interoperability and connectivity. Those links will allow multinationals to trade carbon allowances across jurisdictions, levelling the international playing field by harmonising carbon prices and making them more stable while increasing liquidity. An integrated, international carbon market will not only reduce the cost of cutting emissions—which will spur companies to cut emissions further—but it will also bolster global cooperation on climate change. Talk of a minimum global price for carbon is likely to be a key topic at COP26.

### The need for change

The EU is on the cusp of substantial environmental policy changes resulting from the EU Green Deal that are likely to expand and tighten the carbon market, fundamentally changing how it operates in the region and transforming many of its key design features. Policies expected to affect

the EU ETS include the proposed [Carbon Border Adjustment Mechanism \(CBAM\)](#). While some goods made in the EU are subject to a carbon price through the EU ETS, imports face no such charge. The CBAM would act as a way to level the playing field by imposing a levy on some carbon-intensive sectors, including steel and cement, to help ensure that EU producers are not placed at a price disadvantage or that European decarbonisation efforts are not undermined through carbon-intensive imports (so-called carbon leakage).

The CBAM is meant to act as an incentive for other countries to implement carbon pricing, if only to keep their companies from being penalised when selling to the European market. The policy is [controversial](#), and there are likely to be more discussions before its proposed implementation in 2023. Whatever the outcome, this type of policy intervention is expected to quicken the spread of emissions trading systems around the world.





## The development of the voluntary carbon market

The voluntary carbon market (VCM) drives investment in projects that deliver independently verified carbon reductions through the sale of carbon credits. These credits represent the reduction, avoidance or sequestration of CO<sub>2</sub> emissions and can be traded. In contrast to compliance carbon markets such as the EU ETS, carbon reductions from the VCM are not used to meet legal requirements. Any companies or state actors that set emissions reduction goals can use them.

VCMs emerged in the 1990s when climate activists developed pioneering ways to fight climate change. In 2008, the [International Carbon Reduction and Offset Alliance](#) was established to develop, apply and advance best practices in voluntary climate action through a code of best practice. Although VCMs are significantly smaller than the regulated compliance markets, their use is growing exponentially. At the end of 2019, the VCM market was valued at US\$320m, compared with [US\\$249bn](#) for the EU ETS.

VCMs have a key role to play in enhancing global climate ambition. Today, several countries, including Colombia and South Africa, are starting to leverage VCM mechanisms for their compliance policy design, to bring flexibility and transparency. But the VCM faces the problem of lack of standardisation of accounting principles, similar to the EU ETS. In addition, there is no uniform price for carbon and a lack of quality control across VCM projects to verify levels of emissions reduction or avoidance of emissions. Launched in 2020, the [Taskforce on Scaling Voluntary Carbon Markets](#) is a new global initiative looking to drive even more finance into VCMs and may lead to future work on accounting treatment of VCM assets.





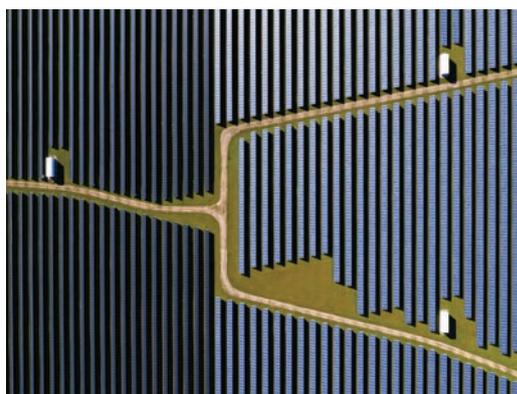
The International Accounting Standards Board (IASB) is consulting on its work plan for the next five years, and there is an opportunity for companies to voice their concerns about the lack of standardisation. Comments are due by 27 September 2021.

### Accounting standardisation is key

Standardisation of accounting for carbon allowances would allow business leaders to show investors and consumers more clearly the cost of their emissions and the impact of their efforts to reduce emissions. This is not only for the companies currently covered by the EU ETS (see “The development of the voluntary carbon market,” page 13). In addition, standardised accounting of emissions improves transparency around carbon pollution, both in terms of what a company is achieving and where it might be falling short. That has both regulatory and reputational benefits that go beyond what might currently seem like the scant materiality of carbon credits on a company’s balance sheet. The importance of providing clear information will grow with the increase of mandated non-financial reporting and with the increase of (expected) future cash-flow implications of emissions.

The International Accounting Standards Board (IASB) is consulting on its work plan for the next five years, and there is an opportunity for companies to voice their concerns about the lack of standardisation. [Comments are due](#) by 27 September 2021. One of the potential large projects identified by the IASB is ‘pollutant pricing mechanisms,’ which would deal with emissions trading schemes such as the EU ETS, and possibly other systems. If enough stakeholders have responded in support of carbon-accounting standardisation, that will give impetus to a movement that has stalled over the past decade.

With the focus on a global price for carbon and the prospect of more intense debates in the run-up to COP26, we believe many stakeholders will consider this important and continue to push for change. It will benefit the industry and help companies develop their sustainability strategies secure in the knowledge that there is a consistent way to account for emissions under cap-and-trade systems. If companies impacted by the EU ETS can lead the way on this, it will strengthen its position to become the template for an interoperable global emissions trading system.



# Survey results

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The EU ETS covers the more than 10,000 power and manufacturing facilities that make up 40% of all emissions in Europe. It is an emissions trading system in which installations buy and/or are granted emission allowances that permit a level of pollution. These allowances have a value that must be accounted for in financial statements. To obtain insights into the accounting for emissions and related allowances, PwC, in conjunction with the IETA, conducted a global survey from September 2020 to January 2021 of companies participating in the EU ETS. This is a follow-up to similar research conducted in 2007.

The questions in the survey focused on the accounting approaches applied by major organisations that are part of the EU ETS. The results demonstrate the different approaches to accounting for carbon allowances that are used today and may provide valuable insights for other emissions trading schemes.

### Respondents

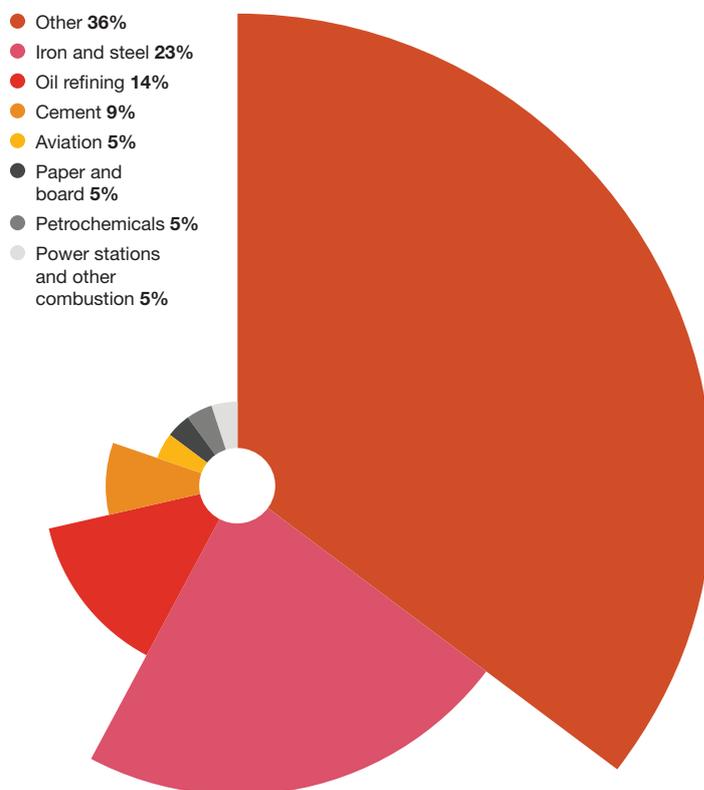
There were 25 complete responses to the survey. Three of the respondents indicated that their company uses EU ETS allowances only for trading purposes. Because these companies don't receive allowances based on allocation data and don't purchase allowances to cover emissions, some questions in the survey were not relevant. To ensure that the survey results were presented on the basis of consistent activities, we excluded these three companies from the analysis below.

The sample is representative of the companies participating in the EU ETS. It includes 22 companies. Almost all of the companies (91%) are large enterprises. With the exception of one, all prepare their financial statements in accordance with IFRS.

The companies are active in a range of industries. Half are in iron and steel and oil refining (see Exhibit 7). The companies that are in an 'other industry' include manufacturers, chemical companies and logistics companies.

The main concerns shared by the respondents are the lack of a single accounting treatment and lack of comparability in emission accounting. This highlights the importance of comparability and transparency and indicates the need for convergence around the treatment of carbon emissions for accounting purposes.

**Exhibit 7: Main industries of survey respondents**



Source: PwC and IETA survey, September 2020 to January 2021



Shortly before the EU ETS launched in 2005, the Interpretation Committee of the International Accounting Standard Board (IASB) issued what was known as IFRIC 3 on Emissions Rights, which was slated to go into effect in March 2005. IFRIC 3 required entities to account for the emission allowances that they received from governments as intangible assets, recorded initially at fair value. A liability was therefore required to be recognised for the obligation to deliver allowances equal to emissions produced and measured at the best estimate of the expenditure required to settle the present obligation at the balance sheet date (usually, the market price).

In June 2005, however, within two months of its effective date, the IASB decided to withdraw IFRIC 3, primarily because of the mismatches it caused between the valuation of assets and liabilities, which resulted in artificial income statement volatility. Although existing standards within IFRS do indirectly deal with the accounting of emissions, the withdrawal of IFRIC 3 meant there was no specific guidance on carbon accounting at the international level.

There have been moves to remedy this, and since 2005, accounting for emissions trading schemes, later named ‘pollutant pricing mechanisms,’ has been on the IASB agenda multiple times, though no new guidance has been published. In the current round of the IASB’s Third Agenda Consultation

for its five-year work plan, which closes in September 2021, pollutant pricing mechanisms are one of the proposed new IASB projects. This is due to the continued lack of comparable accounting standards in this area.

Although some companies used the guidance in IFRIC 3 after its withdrawal, other ways of accounting for emissions allocations emerged. This is reflected by our survey results, which show a variety of approaches.

### The survey

The survey asked questions on how emission allowances are accounted for and how their use impacts their accounting treatment. Here, we present the results, which clearly highlight the lack of standardisation.

### ASSETS

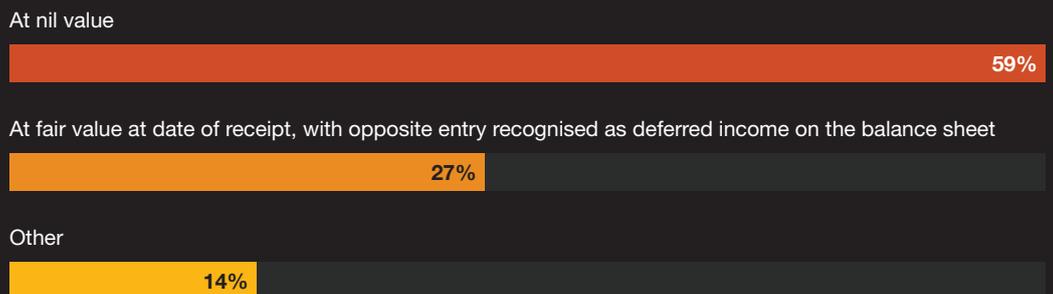
#### Granted and purchased allowances

The majority of the respondents recognise granted allowances at nil value. This is not surprising, as this approach can reduce the volatility in the income statement. A smaller group (27%) recognises granted allowances at fair value with the corresponding entry in deferred income (see Exhibit 8).



#### Exhibit 8: Valuation of granted allowances

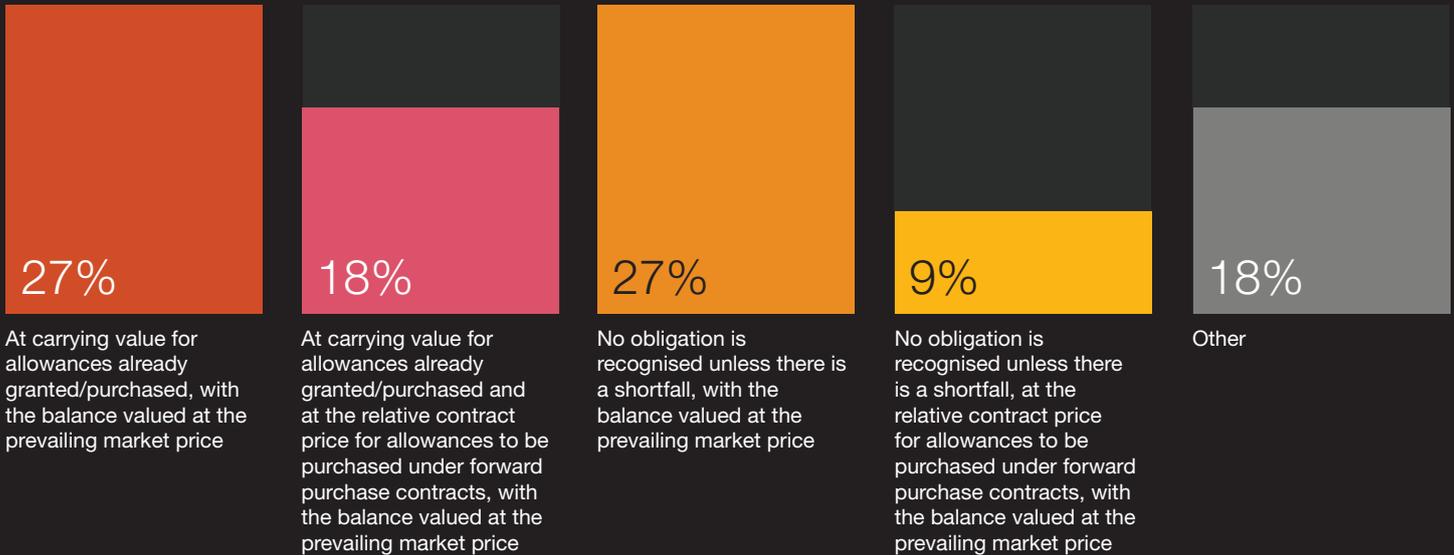
Question: At what value are granted allowances initially recognised on the balance sheet?



Source: PwC and IETA survey, September 2020 to January 2021

## Exhibit 9: Accounting treatment for emissions obligation

Question: How is the obligation for emissions initially measured?



Source: PwC and IETA survey, September 2020 to January 2021

Half of the respondents recognise allowances as intangible assets, 28% as inventory, 9% as debtors and 18% as 'other.' Although there is a level of consistency in the way companies recognise their granted allowances and purchased allowances, not all respondents recognise both their granted allowances and their purchased allowances in the same way.

### Amortisation and revaluation

Respondents are unanimous on their accounting policy with respect to the amortisation or depreciation of the allowances: no respondents amortise or depreciate granted or purchased allowances.

A clear majority of the respondents (77%) do not revalue granted and purchased allowances subsequent to their initial recognition. The remaining respondents (23%) do revalue the allowances, and the majority of these (18% of the 23%) record the opposite entry in the income statement. One respondent recognises the corresponding entry in equity. Given the volatility of the market price for allowances since the scheme began in 2005, these divergent approaches can lead to very different income statement results from one period to the next.

### Releasing deferred income

As indicated in Exhibit 8, 27% of the respondents recognise granted allowances at fair value. All these respondents also recognise deferred income on their balance sheet. However, no consistent approach can be identified in the way they release deferred income to the income statement: 67% of these companies release the deferred income in line with the emissions produced in a period; 33% found different systemic allocation bases over the period for which the allowances were granted, for example, on a straight-line basis.

Half of the companies that release deferred income to the income statement release this deferred income to cost of sales. The other half release deferred income to either operating expenses or other (operating) income.

## LIABILITIES

### Obligation

The survey results showed a variety of recognition and measurement approaches for the obligation associated with the production of emissions (see Exhibit 9): 36% of the respondents do not recognise an obligation unless there is a shortfall; 45% of the respondents do recognise an obligation at the carrying value of the allowances already granted or purchased.

### Sale of granted allowances

Thirteen companies responded that they value their granted allowances at nil value. Of these 13 companies, 70% account for a sale of granted allowances as a gain on disposal recognised immediately as a credit to the income statement, and 15% of these companies account for the sale of granted allowances as a gain on disposal recognised as deferred income and released to the income statement over the remainder of the compliance year.

The majority of the 13 companies (62%) record the sale of granted allowances as other operating income. Other companies record an offset to the cost of sales or as revenue.

### Forward contracts

Twelve of the 22 companies responded to the question on accounting approaches for forward contracts to purchase or sell emission allowances. This may indicate that only half of the respondents engage in forward purchases and sale arrangements with regards to emission allowances.

Forward purchase contracts are treated in a variety of ways for accounting purposes, depending on facts and circumstances. Some companies apply hedge accounting and recognise the effective portion of forward contract gains

or losses in other comprehensive income, and later adjust the cost of the allowances purchased by these amounts. Other companies enter into and continue to hold forward contracts to purchase allowances in accordance with their expected usage requirements. These forward contracts may qualify for 'own use' and are accounted for as executory contracts (off-balance-sheet commitments). A third group of companies records forward contracts at fair value through profit and loss.

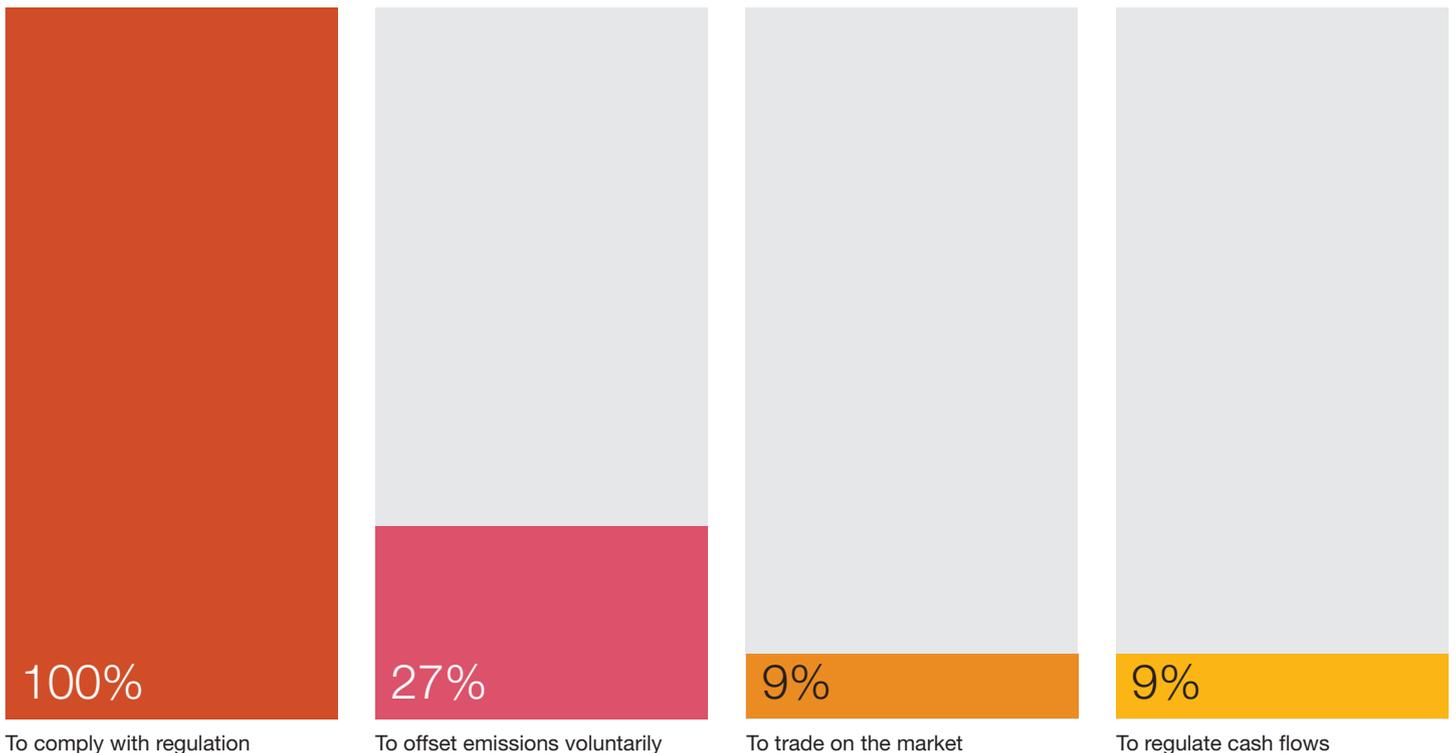
Of the three companies that were excluded from the main analyses of the survey (because they use emission allowances only for trading and did not complete the survey in full), two account for forward contracts at fair value through profit and loss in the income statement.

### Purpose of emission allowances

Twenty-two respondents indicated that they use emission allowances to comply with regulation. This is in line with expectations, given that all but one receive granted allowances under the scheme and all purchase allowances to offset emissions. Next to complying with regulation, respondents also use emission allowances to voluntarily offset emissions, to trade on the market and to regulate cash flows. The three remaining respondents (excluded from the analysis in Exhibit 10) indicated that they only trade allowances and that they do not receive allowances.

## Exhibit 10: Purposes of use of emission allowances

Question: For what purpose do you use emission allowances?



Note: Multiple answers were possible.

Source: PwC and IETA survey, September 2020 to January 2021



# Conclusion

The survey results in 2021 align with the conclusions reached in our survey conducted in 2007, showing that little progress has been made on establishing standardised accounting principles for carbon emissions. Given the evolution of the carbon market in the past 14 years, the increase in prices and the increase in the scope of the EU ETS, we would argue that this continues to be an area that would benefit from common accounting treatment. The diversity of accounting approaches in our survey results shows that as of now, there is no clear way to compare companies' financial statements regarding emissions accounting, and this makes clear communication with key stakeholders more difficult. With pollutant pricing mechanisms on the IASB's radar again as part of the 2021 Agenda Consultation, there is a possibility that progress will be made in reducing diversity in practice and increasing transparency in accounting for carbon emissions.



# Accounting approaches for the EU ETS and equivalent emissions trading schemes—PwC view

Table 1: Three acceptable accounting models for emission schemes that we have observed being applied in practice

	'Full market value' approach (IFRIC 3)		'Cost of settlement' approach	
			'Initial market value'	'Nominal amount'
<b>Granted and purchased allowances (asset)</b>				
<b>When to recognise</b>	Recognise when able to exercise control.			
<b>How to measure</b>	Measure initially at fair value at the date of initial recognition.		Measure subsequently based on either the amount initially recognised (cost model) or the revalued amount (revaluation model).	Measure initially and subsequently at cost. For granted allowances, this is usually nil. Purchased allowances are subsequently subject to impairment review.
<b>Government grant</b>				
<b>When to recognise</b>	Recognise at the same time as allowances.			
<b>How to measure</b>	Measure initially based on the fair value of the allowances at the date of initial recognition. Amortise over the compliance period on a systematic and rational basis.		Measure initially based on the fair value of the allowances at the date of initial recognition. Amortise over the compliance period on a systematic and rational basis.	Measure initially and subsequently at a nominal amount (usually nil).

	‘Cost of settlement’ approach		
	‘Full market value’ approach (IFRIC 3)	‘Initial market value’	‘Nominal amount’
<b>Emissions obligations (liability)</b>			
<b>When to recognise</b>	Recognise when the liability is incurred.		
<b>How to measure</b>	Remeasure the liability based on the fair value of allowances at each period end (or a value based on a forward rate—see paragraphs below), whether they are to be settled using the allowances on hand or purchased from the market.	Remeasure the liability at each period end. The liability to be settled using allowances on hand is measured at the carrying amount of those allowances (see below for methodologies). Any excess emission is measured at the market value of allowances at the period end (or a value based on a forward rate—see paragraphs below).	Remeasure the liability at each period end. The liability to be settled using allowances on hand is measured at the carrying amount of those allowances (see below for methodologies), which is usually nil. Any excess emission is measured at the market value of allowances at the period end (or a value based on a forward rate—see paragraphs below).

## Government grants

When a government grant takes the form of a transfer of a non-monetary asset, it is typical to assess the fair value of the non-monetary asset and to account for both grant and asset at that fair value. IAS 20 also allows an alternative accounting treatment, which is to record both grant and asset at a nominal amount.

Government grants related to assets, including non-monetary grants at fair value, should be presented in the balance sheet by either setting up the grant as deferred income or by deducting the grant in arriving at the asset’s carrying amount. In both cases, this will result in the grant income being recognised in the same period in which the asset is depreciated. In applying this accounting treatment, the grant income is recognised in profit or loss in the same period as the expenditure relating to the asset.

Furthermore, IAS 20 offers some flexibility with regards to where grant income is presented in the income statement. Grants related to income are sometimes presented as a credit in the income statement, either separately or under a general heading such as ‘other income.’ Alternatively, they are deducted in reporting the related expense.

## Impairment

The intangible assets recognised are not amortised, provided residual value is at least equal to carrying value (IAS 38 paragraph 103). Emission allowances recognised as an asset should be tested for impairment where there are indicators of impairment, in accordance with the requirements of IAS 36.

## FIFO versus weighted average

There is an additional consideration for entities using the ‘cost of settlement approach,’ because the measurement of the obligation for which allowances are held will depend on whether the carrying amount of allowances is allocated to the obligation on a ‘first in, first out’ or on a weighted average basis. This is a particular issue where a balance sheet date is not the end of a compliance period—for example, at an interim balance sheet date (in which the financial year is the same as the compliance period) or at a financial year end (in which the financial year is not the same as the compliance period).



## Market rate and forward rate

Where an entity records some or all of its emissions obligations at fair value, it should ordinarily calculate its provision using the market price at the balance sheet date of the relevant allowances that it will need to purchase. However, to the extent that the entity has entered into a forward contract to buy allowances at a fixed price on a future date, it is permissible to provide at the forward contracted rate (rather than the market rate), because this is the best estimate of the amount that the entity expects to pay to settle its obligation. This would be acceptable provided the entity meets the 'own-use exemption' in IFRS 9 with respect to its emission allowance forward contracts. Using the forward rate is not appropriate where the entity trades in these emission allowances. Once the entity commences trading, these instruments fall outside the 'own-use exemption' in paragraph 2.5 of IFRS 9.

The accounting policy chosen for emissions obligations, which should be consistently applied, will depend on the overall accounting model that is being used for emissions (including allowances).

Entities should make clear in their accounting policy note which approach is applied.

## Example

To illustrate the impact on the financial statements of these three accounting approaches, consider the following scenario:

- Companies A, B and C participate in a cap-and-trade scheme for emissions rights.
- All companies have financial year ends of 31 December 20X1.
- Each company receives 10,000 granted allowances on 1 January 20X1.
- The market price of an allowance (equivalent to one tonne of carbon dioxide) at 1 January 20X1 is C10, giving a fair value of C100,000 (C=currency).
- Each company requires 12,500 allowances to cover its obligation for the 20X1 compliance year to be settled in February 20X2.
- The market price at 31 December 20X1 is C12 per allowance.

Accounting policies adopted:

- Company A has adopted the 'full market value' approach, subsequently applying the revaluation model (IFRIC 3).
- Company B has adopted the alternative approach 1 ('initial market value'), subsequently applying the cost model.
- Company C has adopted the alternative approach 2 ('nominal amount').

**Table 2: The companies' financial results and balance sheet for the 20X1 year end**

	'Full market value' approach (IFRIC 3)	Alternative approach 1: 'initial market value'	Alternative approach 2: 'nominal amount'
Figures in C	Company A	Company B	Company C
<b>Income statement</b>			
Release of deferred income	100,000 <sup>i</sup>	100,000 <sup>i</sup>	0
Emissions cost	(-150,000) <sup>ii</sup>	(-130,000) <sup>iv</sup>	(-30,000)
Net income (loss)	(-50,000)	(-30,000)	(-30,000) <sup>v</sup>
Other comprehensive income (loss)	20,000	n/a	n/a
<b>Balance sheet</b>			
Intangible assets	120,000 <sup>iii</sup>	(100,000) <sup>i</sup>	0
Liability	(-150,000) <sup>ii</sup>	(-130,000) <sup>iv</sup>	(-30,000) <sup>v</sup>
Net assets	(-30,000)	(-30,000)	(-30,000)
Current year result	(-50,000)	(-30,000)	(-30,000)
Revaluation reserve	20,000	n/a	n/a
Shareholders' funds	(-30,000)	(-30,000)	(-30,000)

i: 10,000 allowances received measured at fair value at grant date C10 per allowance (10,000 x C10 = C100,000)

ii: 12,500 obligation measured at fair value at period end of C12 per allowance (12,500 x C12 = C150,000)

iii: 10,000 allowances received measured at the fair value at period end of C12 per allowance (10,000 x C12 = C120,000)

iv: Liability based on allowances held measured at carrying amount, and liability related to excess emission fair value at period end [(10,000 x C10) + (2,500 x C12) = C130,000]

v: 2,500 shortfall in obligation measured at fair value at period end of C12 per allowance (2,500 x C12 = C30,000)

- It is important to note that each entity, producing the same level of emissions and holding the same number of allowances, will ultimately be required to make up the same shortfall in allowances. In the example, each company will have to finance the shortfall of allowances, which, if the price of allowances remained constant, would cost each company C30,000. For Company A, the decision to value the entire obligation at the prevailing market price of allowances means that there is a mismatch in the timing of recognition, with the following year recognising a credit to the income statement of C20,000 as the liability is settled. This highlights the volatility in earnings that can arise with the use of this method.
- Further differences in results could arise when considering when the shortfall is recognised under the cost of settlement approach. This is because the measurement of the obligation for which allowances are held will depend on whether the carrying amount of allowances is allocated to the obligation on a FIFO or on a weighted average basis. This is a particular issue where a balance sheet date is not the end of a compliance period—for example, at an interim balance sheet date (in which the financial year is the same as the compliance period) or at a financial year end (in which the financial year is not the same as the compliance period).

- Entities using the FIFO method measure the obligation at the carrying amount per unit of emissions, up to the number of allowances (if any) held at the balance sheet date and at the expected cost (that is, the market price at the balance sheet date) per unit for the shortfall (if any) at the balance sheet date.
- Entities using the weighted average method measure the obligation using the weighted average cost per unit of emissions expected to be incurred for the compliance period as a whole. To do this, the entity determines the expected total emissions for the compliance period and compares this with the number of allowance units granted by the government (and/or purchased) and still held by the entity for that compliance period, to determine the expected shortfall (if any) in allowances held for the compliance period. The weighted average cost per unit of emissions for the compliance period is the carrying amount of the allowances held (which might be nil for those granted for nil consideration) plus the cost of meeting the expected shortfall (using the market price at the balance sheet date), divided by the expected total number of units of emissions for the compliance period.

In other words:

Carrying amount of allowances held + Cost of meeting expected shortfall	= Weighted average cost per unit of emissions for the compliance period
Expected total units of emissions for the compliance period	

The weighted average method is consistent with the approach to measuring items at an interim date (listed in paragraphs B1 to B23 of IAS 34), such as tax, bonuses and volume rebates. The principle under this approach is that, where an entity has an obligation the effective rateable measurement of which is determined by reference to a full period's activities, measurement is made on the basis of the volume of activity giving rise to the obligation up to the interim date at the expected effective rate for the period (determined on the basis of expected activity for the full year). This principle can be rationalised on the basis that there is a presumption that the entity will continue operating and that the best estimate of the amount that the entity expects to pay should recognise this, as well as the fact that settlement can, in reality, only be for a specified period that straddles the interim period.

## Accounting for forward purchases or sales of emission allowances

The main question when accounting for forward purchase or sales of emission allowances is whether these forward purchase or sale contracts for emission allowances fall within the scope of IFRS 9.

IFRS 9—Financial Instruments—applies to contracts to buy or sell a non-financial item where the contracts can be settled net in cash or another financial instrument or by exchanging financial instruments (net settleable contracts). Contracts to buy or sell emission allowances could be examples of such contracts.

Such net settleable contracts will be outside the scope of IFRS 9 where the contract to purchase or sell the emission allowance was entered into and continues to be for the entity's expected purchase, sale or usage requirements. This is commonly referred to as the 'own-use' exemption.

An example of own use in this context might be a forward contract to purchase emission allowances that the entity enters into and continues to hold to meet a shortfall in the entity's emissions obligation, i.e., where granted allowances and/or purchased allowances held by the entity are less than the expected number of allowances required to meet the entity's obligation for a specific period. However, entities should carefully assess that all the criteria for own use are met based on the terms of the contract, the company's continued intent for physical settlement and its past dealings with such contracts.

Where a net settleable contract does not meet the own-use criteria or an entity uses the limited election provided by IFRS 9 not to apply the own-use criteria, it will be recorded at fair value through profit and loss (FVTPL) by default.

However, an alternative treatment to FVTPL may be to apply cash-flow hedge accounting, whereby the change in the fair value of the contract is recognised through other comprehensive income. The adoption of this approach is subject to meeting strict application criteria within IFRS 9 and requires documentation at the outset of the hedge.

Contracts that are not net settleable contracts are outside the scope of IFRS 9, although such contracts should still be reviewed for the existence of embedded derivatives.

# Appendix: Survey methodology

## Survey approach

In conducting the survey, our primary focus was to target companies that received the largest amounts of allowances under the EU ETS. We composed a target list based on the allocations to stationary installations and aircraft operators in 2020 as included in the European Union Transaction Log. We supplemented our target list with companies in the network of the IETA that are affected by the EU ETS as well.

The survey was in the field from September 2020 to January 2021. Our survey reached 88 respondents, and we received 25 complete responses from a range of industries. The group of respondents includes multiple large players in the carbon market, responsible for significant carbon emissions.

## Survey questions

### Company profile

- A. What main industry sector does your company operate in?
- B. What is the size of your company?
- C. Is your company exposed to the EU Emissions Trading Scheme?
- D. The consolidated financial statements of my firm are prepared on the basis of [IFRS, US GAAP, UK GAAP, other].

### Accounting treatment

1. Where are granted allowances initially recognised on the balance sheet?
2. At what value are granted allowances initially recognised on the balance sheet?
3. Where are purchased allowances recorded on the balance sheet?
4. Are granted/purchased allowances subsequently amortised/depreciated?
5. Are granted/purchased allowances revalued subsequent to initial receipt/purchase?
6. Where granted allowances are initially recorded at fair value and deferred income is recognised, how is the deferred income released to the income statement?
7. Where granted allowances are recorded at fair value and deferred income is recognised, where in the income statement is the deferred income released to?
8. How is the obligation for emissions initially measured?
9. Is the obligation for emissions subsequently remeasured?
10. In the event granted allowances (that are recorded at nil value) are sold, how is the sale accounted for?
11. Which line item of the income statement is used to record the sale of granted allowances?
12. How are forward contracts to purchase/sell emission allowances accounted for?
13. For interim reporting periods, in the event expected emissions will exceed allowances held, how is the obligation for emissions recognised over the compliance year?
14. In case you report under a different GAAP than IFRS, please explain whether you are aware of any adjustments between IFRS and your local GAAP.
15. For what purpose do you use emission allowances?
16. Does the purpose of emission allowances (to meet obligation, to compensate emissions voluntarily, to regulate cash flows, or other) impact your accounting treatment? If so, how?
17. Did you change your accounting policy compared to the first phases of EU ETS? If so, can you explain how and why?
18. Do you expect that the transfer from phase 3 to phase 4 of the EU ETS will impact your accounting? If so, can you explain how and why?
19. How material are the emission allowances for your financial statements (expressed as a percentage of carbon allowances over total assets)?
20. Does your company have exposure to other emission schemes?
21. What is your main concern/issue/worry with respect to emission accounting?

# Contacts

## PwC

### Scott Bandura

Partner, PwC Canada  
+1 403 509 6659  
scott.bandura@pwc.com

### Gary Berchowitz

Partner, PwC UK  
+44 7535 100574  
gary.x.berchowitz@pwc.com

### Arjan Brouwer

Partner, PwC Netherlands  
+31 0 61 088 54 55  
arjan.brouwer@pwc.com

### Henry Daubeney

Global Chief Accountant and Head of Reporting  
Partner, PwC UK  
+44 7841 569635  
henry.daubeney@pwc.com

### Heather Horn

Partner, PwC US  
+1 310 874 5449  
heather.horn@pwc.com

### Darrell McGraw

Global Energy, Utilities and Resources Assurance Leader  
Partner, PwC Middle East  
+1 305 432 2837  
darrell.mcgraw@pwc.com

### Karin Meijer

Partner, PwC Netherlands  
+31 0 62 030 39 90  
karin.meijer@pwc.com

### Jonathan Rose

Director, PwC UK  
+44 0 7595 850 848  
jonathan.a.rose@pwc.com

## International Emissions Trading Association (IETA)

### Dirk Forrister

President & CEO, IETA  
forrister@ieta.org

### Adam Berman

European Policy Director, IETA  
+32 28 93 02 39  
berman@ieta.org

### Lisa Spafford

Managing Director, IETA  
+41 22 737 05 00  
spafford@ieta.org

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