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# Reporting for Carbon Trading and International Accounting Standards

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## Abstract

During the first commitment period of the Kyoto Protocol, many developed countries were forced to restrict carbon emissions. Flexible mechanisms were initiated to reduce carbon emissions and support clean energy projects. Regulated carbon markets were established to trade carbon premiums produced by these projects by signatory countries, while carbon premiums produced by nonsignatory countries were traded in voluntary markets. Following limited participation in the Kyoto Protocol, by the leadership of European Union, 195 countries presented contributive ideas in Paris Agreement, which is the first-ever universal, legally binding global climate deal. Kyoto Protocol sets commitment targets that have legal force, while the Paris Agreement emphasizes on consensus building and allows for voluntary and nationally determined targets. Another key difference between Paris Agreement and the Kyoto Protocol is its scope. It does not provide a specific division between developed and developing nations. By means of these changes, trading in voluntary carbon markets is expected to increase due to the higher demand to offset unavoidable carbon emissions. There has been no authoritative guidance published on carbon accounting by the International Accounting Standards Board or the Financial Accounting Standards Board. This study proposes how to measure and report the carbon allowances and carbon credits.

**Keywords:** carbon credits, emission trading mechanisms, carbon markets, IFRIC-3, International Accounting Standards

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## 1. Introduction

Increased energy demand caused by growth and technological development in the world economy is being met largely from fossil fuel-based sources, which cause increasing emission of greenhouse gases (GHGs) into the atmosphere. Research shows that living conditions will be

seriously threatened in the near future if international agreements do not put into force some sanctions to reduce emissions. Thus, the Kyoto Protocol was signed by many developed countries—those most responsible for the currently high GHG levels—in order to restrict future emissions. Flexible mechanisms are developed to enable countries that signed the agreement to fulfill their obligations. These mechanisms are Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading System (ETS). According to protocol, the carbon credits obtained by organizations in countries which do not have any responsibility to restrict their carbon emissions cannot be a part of flexible mechanisms and can be traded in voluntary markets. Since the Kyoto Protocol went into force, the flexible mechanisms especially the Clean Development Mechanisms have been criticized for failing to produce either meaningful emission reductions or sustainable development benefits in most instances. Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, at the conference in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal. Paris Agreement, with its emphasis on consensus building, allows for voluntary and nationally determined targets, and specific climate goals of the agreement are politically encouraged and do not provide a specific division between developed and developing nations. The Paris Agreement is different from previous attempts to reach an international deal on climate, and it requires *all* countries not just the “developed” countries to submit national climate plans.

According to the Paris Agreement, a mechanism is required to contribute to the mitigation of greenhouse gases and support sustainable development. Through this mechanism, which is temporarily called as Sustainable Development Mechanism, parties could collaboratively pursue emission reductions for their Intended Nationally Determined Contributions (INDCs). The Sustainable Development Mechanism will replace the Clean Development Mechanism at the post-Kyoto period (2020). It is much wider in scope because it will be available to all parties as opposed to only Annex-1 parties in Kyoto Protocol.

As a result of emission limitation rates and country quota allocations, countries met new concepts like carbon economy, securitization of carbon, carbon credits, and carbon accounting. Carbon accounting remains an area in which there is no consensus. In 2004, the International Financial Reporting Interpretations Committee (IFRIC) published IFRIC-3 related to the reporting of carbon allowances according to existing International Accounting Standards (IASs), but it caused controversy and was withdrawn 6 months later. After the withdrawal of IFRIC-3, the International Accounting Standards Board (IASB) began a project which is conducted with Financial Accounting Standards Board (FASB), about Emission trading schemes in December 2007. In December 2012, IASB formally reactivated the project as an IASB-only research project and deferred joint work with FASB. In 2015, the project was renamed from “Emission trading schemes” to “Pollutant pricing mechanisms.”

This chapter especially focuses on how to report the carbon allowances in accordance with international standards. The remainder of the chapter is organized as follows. Section 2 mentions about Kyoto Protocol and its mechanisms. Section 3 mentions about Paris Agreement and future of the sustainable development. Section 4 briefly mentions about carbon pricing. Section 5 mentions about the reporting of carbon allowances and expenses according to existing IASs and includes two illustrative cases. Finally, Section 6 summarizes the chapter.

## 2. Kyoto Protocol

The Kyoto Protocol is an attachment of the United Nations Framework Convention on Climate Change (UNFCCC) and was signed by 188 countries. Signatory countries were listed in either Annex-I or Annex-II according to their commitments: Annex-I countries committed themselves to decrease the levels of greenhouse gas emissions by around 5% of 1990 levels over the 2008–2012 period. Annex-II countries, as well as committing to greenhouse gas reduction objectives, were also obliged to give both financial and technological support to developing countries [1]. Fearing a loss of their competitive advantages in international trade, countries such as the United States and China, that are largely responsible for carbon emissions, and newly developing countries such as Turkey, Brazil, and South Korea did not agree to restrict their carbon emissions.

The countries that signed the agreement were required to fulfill their obligations by using a variety of flexible mechanisms such as Clean Development Mechanism (CDM), Joint Implementation (JI), and Emissions Trading System (ETS). Participants are able to obtain carbon credits according to their reduction of carbon emissions and trade them through these mechanisms [2, 3]. While CDM is accessible for the nonAnnex parties of the UNFCCC, JI is applicable for Annex-I parties, which are subject to emission reduction targets as per the obligations of the Protocol for Annex-B parties. **Table 1** shows the parties in the flexible mechanisms.

Flexible mechanisms	Countries		Carbon unit
	Investor	Host country	
Clean Development Mechanism (CDM)	Annex-B parties	NonAnnex parties	Certified emission reduction (CER)
Joint Implementation Mechanism (JI)	Annex-B parties	Annex-B parties	Emission reduction units (ERU)
Emissions Trading System (ETS)	Annex-B parties	Annex-B parties	Assigned amount units (AAU)

**Table 1.** Kyoto Protocol flexible mechanisms.

Under the Clean Development Mechanism (CDM), industrialized countries, which are party in Annex-B, purchase credits from greenhouse gas emission reduction projects in developing countries (nonAnnex parties) to promote sustainable development in the host country. The procedures are defined under the Kyoto Protocol and are governed by United Nations (UN). Carbon credits under CDM are called as certified emission reduction (CER).

Under Joint Implementation Mechanism (JI), any Annex-I country can invest in an emission reduction project in any other Annex-I country as an alternative to reducing emissions. That mechanism enabled countries to reach their emission reduction targets by using emission reduction units (ERUs) obtained through joint projects in a cheaper way.

The European Union Emissions Trading System (EU ETS), which started operations in 2005, is the first international carbon trading system [4]. Noted that 63% of volume-based carbon transactions were carried out by the EU ETS in 2006 rising to 70% in 2007 [5]. The best-known emission trading mechanisms are “baseline and credit” and “cap and trade,” and these operations have been executed by means of regulatory markets.

The carbon credits obtained by organizations in countries which do not have any responsibility to restrict their carbon emissions cannot be a part of flexible mechanisms and can be traded in voluntary markets. According to the agreements, Turkey and some other countries such as the United States and China cannot participate in the regulatory market mechanisms. Organizations in these countries which produce carbon credits trade in voluntary markets.

The voluntary carbon markets emerged to reduce or offset carbon emissions of companies, nonprofit organizations or similar institutions on a voluntary basis. In these markets, operations are carried out on a voluntary basis, regardless of the policies and objectives applied mandatorily under the flexible mechanisms of the Kyoto Protocol. There is no prerequisite for the participation in these markets [6]. Organizations thus develop and implement projects voluntarily to reduce carbon emissions. These emission reductions are certified by competent authorities and exchanged on the over-the-counter (OTC) voluntary carbon markets. Carbon credits in the voluntary market are called as voluntary emission reductions (VERs). Credits from projects in voluntary markets cannot be used by a country which is a party to the Kyoto Protocol to meet emission reduction targets.

Apart from the companies in which the Annex-B countries, which have emission reduction commitments, other companies may want to offset their emissions for several reasons such as to market themselves as “green businesses” to their customers. They reduced their emissions as much as possible and wish to offset their remaining emissions to become carbon neutral by purchasing an equivalent number of carbon credits from voluntary markets. Other important buyers of the carbon credits of voluntary markets are the nongovernmental organizations (NGOs) such as the World Bank to help the global reduction of greenhouse gas emissions and help the sustainable development of the host country. So the most important point for the carbon reduction projects in voluntary markets is that whether project contributes to the sustainable development of the host country.

### **3. Paris climate conference**

Following limited participation in the Kyoto Protocol and the lack of agreement in Copenhagen in 2009, whole world has been searching a common ground of agreement on a global scale to limit global warming. By the leadership of European Union, countries presented much more satisfactory information and contributive ideas in Paris climate conference 2015. Conference was a great success because two big pollutant countries the United States and China contrary to Kyoto agreement acted jointly and showed a constructive attitude.

At the conference in December 2015, 195 countries adopted the first-ever universal, legally binding global climate deal. Before and during the Paris conference, countries submitted

comprehensive national climate action plans [7]. The agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C.

The Paris Agreement is an agreement within the United Nations Framework Convention on Climate Change (UNFCCC) dealing with greenhouse gases emissions, mitigation, adaptation, and finance starting in the year 2020. The Paris Agreement basically differs from Kyoto Protocol in two subjects. Unlike the Kyoto Protocol, it does not set some targets forced by legal authorities instead it encourages voluntarily determined targets by the countries [8]. The only requirement under international law is to report and review the targets achieved [9].

Another key difference introduced by Paris Agreement is the scope of the agreement. While the Paris Agreement still emphasizes the principle of “Common but Differentiated Responsibility” – the acknowledgment that different nations has different capacities and duties to climate action—it does not provide a specific division between developed and developing nations. The Paris Agreement is different from previous attempts to reach an international deal on climate change, and it requires *all* countries not just the “developed” countries to submit national climate plans.

Kyoto Protocol differentiated between Annex-1 and nonAnnex-1 countries. In the Paris Agreement, all parties will be required to submit emission reduction plans [10].

The Paris Agreement suggests a market-based mechanism that would allow countries to trade internationally transferred mitigation outcomes. Unlike the Clean Development Mechanism, which is one of the mechanisms of Kyoto Protocol, which was created and used by signatory countries to trade carbon premiums, a market-based mechanism under the Paris Agreement includes all the countries [11].

## 4. Pricing

Over the last few years, voluntary carbon market participants have reported a maturing market. In this context, while the total transaction volume grew in 2015, buyers paid lower prices across almost all project types. Weighted average prices of carbon premiums dropped dramatically in 2015 compared to 2014 and 2013 [11].

In the light of these pricing dynamics, market participants have recently launched several different initiatives to try to increase prices where they view them as too low. The Fairtrade Climate Standard, the result of a multi-year collaboration between the Gold Standard Foundation and Fairtrade International, launched in December 2015. Just as Fairtrade bananas and cocoa have minimum prices, the standard introduces a price floor for carbon offsets 13 Euros per ton for tree-planting projects, 8.2 Euros per ton for energy efficiency, and 8.1 Euros per ton for clean energy projects. There are some initiatives to set minimum prices per ton but none have verified yet. Another initiative executed by the World Bank is known as Methane and Climate Change Mitigation-PAF, which aims to organize auctions for buyers to purchase offsets [11].

Although carbon pricing is not in the scope of our study, the price changes in carbon emission markets must be tracked and reflected to the financial reports.

## 5. Accounting and reporting of carbon trading

After the ratification of the Kyoto Protocol, carbon markets created great excitement and began to be discussed by organizations. However, carbon accounting remains an area in which there is no consensus. There had already been several initiatives in carbon accounting starting from the early 2000s. In 2003, the Emerging Issues Task Force (EITF)<sup>1</sup> brought the topic onto the agenda, but it was removed in a very short time [12]. In 2004, the International Financial Reporting Interpretations Committee (IFRIC) published IFRIC-3 under the heading of regulation and reporting of carbon emissions, but it caused controversy and was withdrawn 6 months later [13]. Due to the lack of mandatory regulations, many companies developed their own accounting policies related to carbon emissions during this period [12].

Carbon allowances and related accounts should be reported in financial statements in accordance with international standards and this duty therefore well within the scope of the accounting standard setters. IFRIC-3 specified accounts and measurements under the “cap and trade” system according to the existing IASs [14]. IFRIC-3 specified that

- emission rights (allowances) are recognized as intangible assets and measured in accordance with IAS 38 *Intangible Assets*,
- if the allowances issued by a government for less than fair value, the difference between the amount paid and fair value of the allowance is accounted as government grant in accordance with IAS 20 *Accounting for Government Grants and Disclosure of Government Assistance*, and
- as a participant produces emissions, a provision for its obligation is recognized to deliver allowances in accordance with IAS 37 *Provisions, Contingent Liabilities and Contingent Assets*.

According to IFRIC-3, the participant recognizes the allowances as an intangible asset at fair value. At the initial recording, because the participant receives this allowance without a payment, it recognizes a grant which is actually deferred revenue in financial statements at the same amount as the allowances. However, after the initial recording, the different measurement bases in the income statement distort the profit or loss. In IFRIC-3, a participant recognizes a provision for its obligation to deliver allowances as emissions are produced and to measure it at the fair value at each reporting date. Nevertheless, this grant is gradually transferred from deferred revenue (liability) to income at its initial value. Another issue is that if the participant prefers to use the fair value model to measure its intangible assets after initial recognition, allowances will change according to the changes in the fair value, while

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<sup>1</sup>An organization formed in 1984 by the Financial Accounting Standards Board (FASB) to provide assistance with timely financial reporting. The EITF holds public meetings in order to identify and resolve accounting issues occurring in the financial world.

there will be no change on the liabilities. So the effect of price changes on the asset side of the balance sheet will differ from that on the liability side.

After the withdrawal of IFRIC-3, to guide participants, the IASB began a project about Emission Trading Schemes in December 2007. The project is being conducted with the FASB and aims to develop a comprehensive guidance on accounting for emission trading schemes. The aim of that project is not to result in a new standard, but rather to revise the existing standards (IAS 38, IAS 39, and IAS 20). Up to May 2010, the IASB tentatively decided that an entity should recognize the allowances received free of charge from the government as assets and measure them initially at fair value. Another tentative decision was that the entity recognizes a liability that represents its promise to pay allowances throughout the commitment period irrespective of whether the entity has already emitted.

In December 2012, IASB formally reactivated the project as an IASB-only research project and deferred joint work with FASB. In 2015, the project was renamed from “Emission trading schemes” to “Pollutant pricing mechanisms” to address a variety of schemes that use emissions allowances to manage the emission of pollutants. The board canceled all tentative decisions and makes a fresh start related to the project [15].

### 5.1. Illustrative example 1

Company A is operating in a developing country and decided to develop a new wind plant project and planned to make an Emission Reduction Purchase Agreement for the emission reductions with Company B which operates in a developed European Union country.

Company B is in the *European Union Emissions Trading Scheme* (EU ETS) and a maximum (cap) amount of greenhouse gases that can be emitted is determined by the authorities. If emission exceeds what is permitted by its allowances, Company B must purchase allowances from others in the *European Union Emissions Trading Scheme* or from a nonAnnex-1 developing country under the Clean Development Mechanism. Conversely, if Company B has performed well at reducing its emissions, it can sell its leftover credits in EU ETS.

By the end of 2014, Company A decided to apply following steps that all carbon finance projects have in the Clean Development Mechanisms (see **Figure 1**).



**Figure 1.** Steps of a carbon finance project under the Clean Development Mechanism.

At the first step, Company A prepared the Project Design Document (PDD) that identifies the details of the project such as the type of the project (energy supply, transport, waste management, etc.), sector background, and expected schedule of the project, financial details, expected environmental benefits, and project-related risks. During the implementation stage of the project, company estimated the greenhouse gas emission reductions (in tons

of CO<sub>2</sub>) and signed Emission Reduction Purchase Agreement. The difference between the baseline scenario (the amount of emission before the project) and the project scenario computed as the emission reductions achieved through the project. At the end of 2015, the Project Design Document be checked and approved by the independent verifier named Designated Operational Entity (DOE) and by an agency of the government called Designated National Authority (DNA) and Clean Development Mechanism Executive Board. After registration steps, Company A started implementing the project at the beginning of 2016 and signed an Emission Reduction Purchase Agreement with Company B for the emissions traded at \$10 per ton of CO<sub>2</sub> for a 7-year period that is renewable twice.

By the end of 2016, the first year of the project's implementation period, actual emission reductions checked by the DOE and Company A received CER (certified emission reduction) for 12,000 tons of CO<sub>2</sub> reduction. Carbon credits were verified by Gold Standard.

Company A incurred following up-front costs during the approval and registration process in 2015:

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#### Project preparation

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• Project assessment cost	\$5000
• Document preparation cost	\$40,000
• Validation	\$30,000
• Legal cost	\$3000
Registration fees	2% of the credits

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During the project implementation process, Company A also incurred following costs:

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#### Monitoring costs

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• Verification	\$5000 per year
• Monitoring	\$5000 per year
Issuance fees (deducted by CDM Executive Board)	2% of issued CERs

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Company B received a grant of allowances covering 30,000 tons<sup>2</sup> of emissions for 2016 (assigned amount units). But the company has an expectation of 40,000 tons of emissions in a year and signed an Emission Reduction Purchase Agreement for 10,000 tons of CO<sub>2</sub> yearly with Company A for the emission reductions for \$10 per ton of CO<sub>2</sub> (certified emission reduction), for a 7-year period that is renewable twice.

The annual cycle for the allocation of allowances and assessment of emissions is a full year of 2016 and company reports semiannually. The fair value of allowances in EU ETS at the reporting dates is given below:

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<sup>2</sup>Ton refers to CO<sub>2</sub> equivalent ton.

Fair value of allowances	
Date	Price per unit (\$ per ton)
January 1, 2016	12
June 30, 2016	14
December 31, 2016	10

The realized emissions by Company B from January 2016 to June 2016 are 16,000 tons and at June 30 the entity still expects emissions of 40,000 tons until the year end. At the year end, the emissions exceeded the expected amount by 8000 tons. Reporting for Company B under the “cost method” versus “revaluation method” is given in **Tables 2** and **3**.

Date	Accounts	Debit	Credit
January 01, 2016	Emission rights [assigned amount units, (AAU)]	360,000	
	Government grants (deferred revenue) (30,000 tons × \$12 = \$360,000)		360,000
June 30, 2016	Manufacturing overhead (amortization of emission rights)	192,000*	
	Emission rights (AAU)		192,000
June 30, 2016	Government grants (deferred revenue)	192,000	
	Revenue from government grants (16,000 tons × \$12 = \$192,000)		192,000
December 31, 2016	Emission rights (certified emission rights (CER))	100,000	
	Cash (10,000 tons × \$10 = \$100,000)		100,000
December 31, 2016	Loss from impairment of assets	28,000	
	Emission rights (AAU) 14,000 tons × (\$12–10) = \$28,000		28,000
December 31, 2016	Manufacturing overhead (amortization of emission rights)	220,000**	
	Emission rights		220,000
December 12, 2016	Government grants (deferred revenue)	168,000	
	Revenue from government grants (14,000 tons × \$12 = \$168,000)		168,000

Notes: Amortization of the emission rights by using units of production method = (Cost-residual value) × (1/Total tons produced) × Actual tons produced.

\*\$360,000 × 1/30,000 tons × 16,000 tons = \$192,000.

\*\*[\$140,000 × 1/14,000 tons × 14,000 tons] + [\$100,000 × 1/10,000 tons × 8,000 tons] = \$220,000.

**Table 2.** Reporting for company B under the “cost method”.

Date	Accounts	Debit	Credit
January 1, 2016	Emission rights [assigned amount units (AAU)]	360,000	
	Government grants (deferred revenue)		360,000
	(30,000 tons × \$12 = \$360,000)		
June 30, 2016	Emission rights (AAU)	60,000	
	Intangible assets revaluation fund		60,000
	(30,000 tons × (\$14 – \$12) = \$60,000)		
June 30, 2016	Manufacturing overhead (amortization of emission rights)	224,000*	
	Emission rights (AAU)		224,000
June 30, 2016	Intangible assets revaluation fund	32,000	
	Prior period earnings		32,000
	(\$60,000 × (16,000 tons/30,000 tons))		
June 30, 2016	Government grants (deferred revenue)	192,000	
	Revenue from \$\$		192,000
	(16,000 tons × \$12 = \$192,000)		
December 31, 2016	Emission rights (certified emission rights (CER))	100,000	
	Cash		100,000
	(10,000 tons × \$10 = \$100,000)		
December 31, 2016	Intangible assets revaluation fund	28,000	
	Loss from impairment of assets	28,000	
	Emission rights (AAU)		56,000
	(14,000 tons × (\$14 – \$10) = \$56,000)		
December 31, 2016	Manufacturing overhead (amortization of emission rights)	220,000**	
	Emission rights		220,000
December 31, 2016	Government grants (deferred revenue)	168,000	
	Revenue from government grants		168,000
	(14,000 tons × \$12 = \$168,000)		

Notes: Amortization of the emission rights by using units of production method = (Cost-residual value) × (1/Total tons produced) × Actual tons produced.

\*\$420,000 × (1/30,000 tons) × 16,000 tons = \$224,000.

\*\*[\$140,000 × (1/14,000 tons) × 14,000 tons] + [\$100,000 × 1/10,000 tons × 8,000 tons] = \$220,000.

**Table 3.** Reporting for Company B under the “revaluation method”.

According to IAS 20, government grants are recognized in profit or loss systematically in the periods which the entity recognizes expenses for the related costs.

Company B recognizes the allowances as an intangible asset at fair value. Because the company received this allowance as assigned amount units of carbon emissions without a payment, it recognized a grant which is actually deferred revenue in financial statements at the same amount as the allowances. At the reporting date, grant is gradually transferred from deferred revenue (liability) to income at its initial value. According to IAS 38, after initial recognition intangible assets are recorded by using either a cost method or revaluation method. In the cost method, after initial recognition intangible assets should be carried at cost less accumulated amortization and impairment losses. In the example, emission rights are amortized when company emits carbon. At the end of the second period, emission rights are impaired because of the decrease in price to \$10 per ton.

According to the Revaluation Model after initial recognition, an intangible asset is carried at a revalued amount. The revalued amount is equal to its fair value at the date of the revaluation unless any subsequent accumulated amortization and any subsequent accumulated impairment losses. The increase in an asset's carrying amount as a result of a revaluation is recognized in other comprehensive income and accumulated in equity. However, the increase need to be recognized in profit or loss in so far as it reverses a revaluation decrease regarding that asset of the same asset previously recognized in profit or loss. If the carrying value of an intangible asset is decreased as a result of a revaluation, the decrease is recognized in profit or loss. However, the decrease is recognized in other comprehensive income in so far as any credit balance in the revaluation fund of that asset.

Transactions related to the carbon project are journalized in **Table 4** in the books of Company A.

Journal entries according to cost method			
Date	Accounts	Debit	Credit
2015	Research & development expenses	78,000	
	Cash		78,000
2015	Research & development expenses	2000	
	Cash		2000
	(Registration fee: (10,000 tons × \$10) × 2%)		
2016	Emission rights (CER)	120,000	
	Unearned revenue		120,000
	(12,000 tons × \$10)		
2016	Research & development expenses	2400	
	Cash		2400
	(Issuance fee: (12,000 tons × \$10) × 2%)		

Journal entries according to cost method			
Date	Accounts	Debit	Credit
2016	Unearned revenue	100,000	
			Revenue from emission reduction projects
	(10,000 tons × \$10)		100,000
2016	Research & development expenses	10,000	
			Cash
	(Project monitoring costs)		10,000

**Table 4.** Reporting for company A.

## 5.2. Illustrative example 2

A Company in Turkey decided to develop an engineering system for low-income families that treats contaminated water. The system reduces the direct release of GHGs into the atmosphere by avoiding the need to burn firewood to boil water. It is estimated that the project will generate more than 20,000 tons of emission reductions per year, the equivalent of taking nearly 350,000 cars off the road for 1 year. Carbon credits obtained through the project cannot be used in a flexible mechanism, so it can be sold in voluntary markets.

In 2016, an Emission Reduction Purchase Agreement (ERPA) was signed with the World Bank for the emission reductions for the purchase of 25,000 tons, \$9 per ton of CO<sub>2</sub> during 10 years.

For a voluntary carbon project, the company will apply the same steps as in Clean Development Mechanisms except the approvals by an agency of the government called as Designated National Authority (DNA) and Clean Development Mechanism Executive Board. The company learned that the process of meeting the requirements for a voluntary project is usually easier and shorter than developing a CDM project.

Company prepared the Project Design Document (PDD), which identifies the details of the project, such as the type of the project, sector background, expected schedule of the project, financial details, expected environmental benefits, and project-related risks. Company estimated the greenhouse gas emission reductions in the tons of CO<sub>2</sub> (carbon dioxide) in the baseline scenario (the amount of emission before the project) and the project scenario. The difference between baseline and project scenario will be the emission reductions achieved through the project. At the end of 2015, the Project Design Document then be checked and approved by an independent verifier called as Designated Operational Entity (DOE). After these steps, project is registered and company started implementing it at the beginning of 2016.

In the first year, the amount of emissions reduction achieved through the project is assigned by an independent appraiser as 30,000 tons and carbon credits are verified by Voluntary Gold Standard.

Company incurred following up-front costs during the approval and registration process in 2015:

During project implementation process, Company also incurred following costs:

Reporting under voluntary markets is given in **Table 5**.

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**Project preparation**

• Project assessment cost	\$5000
• Document preparation cost	\$35,000
• Validation	\$20,000
• Legal cost	\$3000
Registration fees	2% of the credits

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**Monitoring costs**

• Verification	\$5000 per year
• Monitoring	\$5000 per year
Issuance fees (deducted by voluntary market registries)	30 cents per VER

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Date	Accounts	Debit	Credit
2015	Research & development expense	63,000	
	Cash		63,000
	(Project preparation cost)		
2015	Research & development expense	4500	
	Cash		4500
	(Registration fee: (25,000 tons × \$9) × 2%)		
2016	Emission rights	270,000	
	Unearned revenue		270,000
	(30,000 tons × \$9)		
2016	Research & development expense	9000	
	Cash		9000
	(Issuance fee: 30,000 tons × 30 cents)		
2016	Research & development expense	10,000	
	Cash		10,000
	(monitoring costs)		

Date	Accounts	Debit	Credit
2016	Cash	225,000	
	Emission rights (25,000 tons × \$9)		225,000
2016	Unearned revenue	225,000	
	Revenue earned from carbon projects (25,000 tons × \$9)		225,000

**Table 5.** Reporting for carbon credits under voluntary markets.

## 6. Conclusion

Climate change is one of the biggest challenges of this century. This change affects poor countries more than the developed and rich ones and it is evaluated as human rights intervention. To reduce greenhouse gas emissions, regulatory bodies have been working on this issue and developing some mechanisms. The basic idea of these mechanisms is to create a commercial value referred to as carbon finance by reducing carbon emissions by green projects. These projects can be financed by the companies that emit the higher amount of CO<sub>2</sub> than the proposed amount. In this process, high-carbon-emitting companies help to meet the costs for emission reduction projects. Carbon emission reductions are calculated as the difference between the base case (conventional technology) or “business-as-usual” and the proposed case (clean energy technology) measured in tons of CO<sub>2</sub> per year. This process is regulated through special markets where securitized emission reductions are traded.

Over time, some important steps have been taken in carbon accounting. In 2003, the Emerging Issues Task Force brought the topic onto the agenda, but it was removed in a very short time. In 2004, the International Financial Reporting Interpretations Committee (IFRIC) published IFRIC-3 under the heading of regulation and reporting of carbon emissions. IFRIC-3 specified accounts and measurements under the “cap and trade” system but it caused many controversies and was withdrawn 6 months later. IASB began a project to develop a comprehensive guide for participants about Emission Trading Schemes in December 2007. Up to May 2010, the IASB tentatively decided that an entity should recognize the allowances received free of charge from the government as assets and measure them initially at fair value. Another tentative decision was that the entity recognizes a liability that represents its promise to pay allowances throughout the commitment period irrespective of whether the entity has already emitted.

In December 2012, IASB formally reactivated a project as an IASB-only research project and deferred joint work with FASB. In 2015, the project was renamed from “Emission trading schemes” to “Pollutant pricing mechanisms” to address a variety of schemes that use emissions allowances to manage the emission of pollutants.

In 2015, IASB canceled all tentative decisions and makes a fresh start related to the project. Following this action, staff presents two papers to aid in the further discussion. First, Agenda Paper 6A emphasizes some of the difficulties encountered in earlier approaches. Earlier approaches tried to recognize emission allowances and the related obligations created by the mechanisms in accordance with existing Standards. Second, Agenda Paper 6B provides a simple numerical example of a typical cap-and-trade type of emissions trading scheme to show how different accounting approaches produce different results in the statements. The purpose of the Agenda Paper 6B is to demonstrate the accounting entries and resulting financial statement line items that have developed in the absence of specific guidance in IFRS [16].

This chapter focuses on reporting of carbon emissions. Two examples are designed to show the relevant accounts for regulatory and voluntary markets. In the illustrated examples, emission rights (allowances) are recognized as intangible assets and measured in accordance with IAS 38 Intangible Assets, the difference between the amount paid for the allowance and fair value of the allowance is accounted as government grant in accordance with IAS 20 Accounting for Government Grants and Disclosure of Government Assistance. Emission rights are amortized when company emits carbons and related grant is gradually transferred from deferred revenue to income at its initial value at the end of each reporting date. Due to not having a regulatory guidance yet, this study is expected to contribute to the literature how to measure and report the carbon allowances and carbon credits according to existing International Accounting Standards.

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