

Towards Convergence of Accounting for Emission Rights

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Abstract: Already from the start of the EU ETS, several investigations and analyses have shown that the involved actors are far from treating the emission rights uniformly in their accounting. There is no accepted and uniformly applicable method to determine the exact category and value of these new asset items and to identify how the obligations arising due to the reimbursement of emission rights are to be assessed. At the same time, the various measurement methods may cause significant differences in the profits reported by companies. Therefore, the companies and professional organisations involved in emissions trading are indeed entitled to demand clear guidelines about the accounting treatment of emission rights. The main problem arising in practice is that it is not clarified nor even considered from a theoretical aspect how far the various presentation and measurement methods contribute to the original objective of the emissions trading system, and hence which procedure would represent the most advantageous approach from accounting and social perspectives. The purpose of this research is, through the critical evaluation of the contents of national guidelines issued by professional bodies of European countries and through the review of the impacts of these specifications, to contribute to the creation of a clear and uniformly applicable method in the field of accounting for emission rights. A convergence in accounting for emission rights would be beneficial not only for companies, but also for professional bodies and legislators, independent of which member state are they from.

Keywords: emission rights; EU ETS; accounting; IFRS

1 Introduction

Today it seems to be a more accepted view that the human factor is decisive in the currently experienced change of climate, although in many cases there are scientific statements to the contrary as well. The natural greenhouse effect is a precondition of life on Earth, because it is indispensable for providing a tolerable temperature. With the progress of industrialisation, the ratio of greenhouse gases has continuously grown in the atmosphere, and this – according to the dominant

scientific view – contributes to the global climate change. Each country has various means to reduce the anthropogenic factors of global climate change, such as decreasing greenhouse gases, and these means include the fostering of environmentally conscious thinking, providing precise information to consumers about the impact of their consumption decisions on the emission of carbon dioxide, and supporting energy efficient solutions and a number of economic and financial incentives, of which only one is the setting up of the quota trading market on which this paper focuses. [1]

According to the theoretical model, the emission rights applying to the relevant period are distributed among the actors of this market, keeping in mind that the permitted emission level should be gradually lowered from period to period by each actor. In case an actor (organisation or individual) exceeds the emission level permitted for it, it can purchase the required quotas from an actor of the market who has surplus emission rights. The market mechanism ensures in this way the reduction of total emissions, because first those actors will curb their emissions which are able to do so by spending a limited amount, and then they are followed by those for whom reduction is much more expensive. In the United States, the system set up for sulphur dioxide emissions is based on this model, and the European Union bases its scheme introduced for carbon dioxide emissions also on this system.

1.1 The European Union Emissions Trading Scheme (EU ETS)

The Community and its Member States agreed that they would jointly meet their obligations to curb the climate change caused by anthropogenic factors, and to establish a European market which ensures the efficient trade of the emission allowances¹ of greenhouse gases. The related guidelines were accepted in 2003. The system covers all those sectors which are responsible for most of the EU's total greenhouse gas emissions. The experimental period (2005 to 2007) of introducing the trading system was followed by the first five-year trading period between 2008 and 2012, which coincided with the obligation period of the Kyoto Protocol. The third period of the system will run from 2013 to 2020.

For each period, the Member States elaborate their own national plans, in which they determine how many allowances will be distributed in the given period, by which method and for which facilities. This plan must be approved by the European Commission. The competent authority credits the relevant annual emission allowances every year by 28 February to the operator's account. The

¹ One emission allowance gives eligibility to emit one tonne of carbon dioxide equivalent in a specified period. Tonne of carbon dioxide equivalent: one metric tonne of carbon dioxide (CO₂) or such a quantity of any other greenhouse gas with an equivalent global-warming potential.[8]

allowances can be transferred within the Community between entities, and between entities within the Community and entities in third countries, if the latter recognise the allowances without limitations. The emission allowances are generally received free of charge by the operators involved, but depending on the Member State's decision, one part of the total quantity – up to 5% in the first three-year period and up to 10% between 2008 and 2012 – can be purchased at an auction. The allowances only apply to the emissions which were made in the period for which they were issued. [8]

Every year, up to 30 April at the latest, the emission allowances corresponding to the total controlled emission of the relevant facilities must be surrendered by the operator of the facilities to the state, and then the emission allowances handed over are cancelled. An operator which does not submit by the deadline the allowances of an appropriate quantity covering the previous year's emissions must pay a fine. The excess emission penalty is 100 Euros on each tonne of carbon dioxide equivalent emitted by the facilities, but uncovered by surrendered allowances (in the first three-year period the penalty was lower, only 40 Euros). Paying the fine does not relieve the operator from handing over in the following year the emission allowance of a quantity corresponding to the excess emission. [8]

According to the analyses carried out so far, the EU ETS can be considered to be a successful scheme, because it has obviously contributed to the member countries meeting their obligations undertaken in the Kyoto Protocol. However, the experience gathered in recent years has highlighted several problems, on the basis of which the European Commission identified many modification proposals. For example, the scope of the ETS will be extended in the future to several new industrial branches and sectors. In comparison with the current practice, in the period between 2013 and 2020, a much higher ratio of allowances will be auctioned, instead of a gratis distribution.

1.2 The Challenges of Accounting for Emission Rights

Accounting – as an area responsible for the external and internal data service of entities – is involved from several aspects in the emission rights and generally in the global climate change. One of the most important issues is: can the emission rights be presented as assets, and if so, which asset item should it be, and what is the value at which it is advisable to do so. From a theoretical side it is not clarified, and hence in practice it causes serious difficulties in identifying and classifying the emission rights properly. It is not clear for the entities whether this new item should be treated as rights falling into the category of intangibles or as securities or perhaps as inventories. In the current system, the organisations obtain most of the emission allowances free of charge when they are initially distributed, and only a small part is to be purchased in the EU ETS. Of the 26 largest polluters in the EU ETS, based on the 2008 statements, as many as 11 present the

allowances received through government distribution – i.e. the grants – as intangibles, 2 as inventories, and 6 as other assets, while the other enterprises do not disclose these figures. Similar proportions are found in the initial disclosure of emission rights [18]. The picture is varied regarding the measurement of liabilities and provisions arising due to the repayment of emission rights, in both theory and practice. The evaluation of emission allowances received as grants is a disputed area, but at the same time – because of the magnitude of distributed emission allowances – it may have a substantial impact on every entity's financial statements.

Already in the first trading period, two trends emerged in the disclosure and assessment of emission rights [1]:

- One of them recommended the showing of net position in the case of emission rights. In this event, only the purchased emission allowances may be presented in the balance sheet. In the first trading period, lacking any regulations, as many as 60% of the examined entities applied this net approach [14].
- The other trend was the gross method, basically in accordance with the experience gathered regarding the sulphur dioxide emission trading system launched by the US EPA in 1990. Accordingly, the emission allowances obtained as grants should be shown in the balance sheet just like the purchased allowances, and they are to be taken into consideration in the expenses when they are used as a compensation for the emitted pollution [22]. Therefore, the emission rights obtained free of charge are to be treated as a government grant, and they are to be shown at the fair value at the time of receipt. This creates a basis for the uniform handling of emission rights regardless of whether having been obtained by government distribution or by purchase.

According to the IETA² review of 2007, the gross method was used by only 5% of the companies, and this approach was reflected also by the IFRIC 3 published in 2004 and then withdrawn after less than six months. A review of the 2008 statements of the 26 largest polluters covered by the EU ETS confirms the finding already outlined, namely that contrary to the IFRIC 3 recommendation, most of the involved companies use the net method (15 out of the examined 26 enterprises) [18].

² International Emissions Trading Association

1.3 IFRIC 3 Interpretation about the Emission Rights

The IASB³ Interpretations Committee⁴ issued the IFRIC 3 Emission Rights Interpretation on 2 December 2004. In spite of the fact that IFRIC 3 was withdrawn by IASB less than six months later in June 2005, this interpretation has an impact until this day on the practice of accounting for emission rights [19] [20].

The European Financial Reporting Advisory Group (EFRAG) did not recommend the endorsing of IFRIC 3 [10], and on this basis, the European Commission did not approve the interpretation either, and in June 2005 it was withdrawn by IASB [12]. EFRAG's argument was that IFRIC 3 did not meet the requirements identified in association with the application of international accounting standards, i.e. the requirements laid down in Regulation 1606/2002 of the European Parliament and Council⁵, because

- it is contrary to the true and fair view principle (Directive 83/349/EEC, Article 16, clause (3), and Directive 78/660/EEC, Article 2 (3)), and
- it fails to meet those requirements of clarity, relevance, reliability and comparability which are expected of the financial information necessary for economic and responsible management decisions [10].

EFRAG has expressed its concerns also about the cost model, the revaluation model and the accounting entries after the compliance period. In the course of applying the cost model – resulting from the different evaluation of assets and associated liabilities – mismatch may arise in the balance sheet and in the profit and loss statement. The mismatch observed in the case of fair value accounting can be traced back to the revaluation of emission rights against equity and the evaluation of resulting liabilities against profit and loss. This mismatch also prevails after the compliance period, until the debt is settled. EFRAG's further criticism was that the companies were not allowed – in spite of this being in harmony with the standards – to calculate the result of the process at the end of the compliance period, including the net effect in the profits [10].

Further accounting opportunities featuring in the standards referred to by IFRIC 3

According to IAS 20 dealing with the accounting of government grants, two solutions are available in the case of non-monetary government grants:

- the assets, and the grants associated with the assets, can be presented at a fair value in the balance sheet (government grant approach, GGA) or
- both the assets and the grants can be shown at the nominal amount (nominal amount approach, NAA) [17].

³ International Accounting Standards Board

⁴ International Financial Reporting Interpretations Committee (IFRIC)

⁵ Regulation (EC) No 1606/2002 of the European Parliament and of the Council

The IFRIC 3 interpretation had specified accounting based on a fair value. If the company applied the nominal amount method, the emission rights and the received grant would also be presented at a nominal amount, which would be zero in this case, because no emission value prevails. The method practically leads to the same result as the net approach, because the grants received and the emission rights obtained by the grants balance out each other, i.e., both the so obtained emission rights and the grants received appear at a zero value in the balance sheet. If the company buys the emission rights, they are booked at the purchase price.

According to IAS 37, provisions can be generated in two ways: by the gross and net liability approaches. The IFRIC 3 interpretation advocated the recognition of provisions by the gross method, i.e., presented the liabilities applying to the handover of emission rights.

In the case of recognition provisions by the net approach, the companies do not recognise provisions until they have as coverage a volume of emission rights necessary for handing over a quota corresponding to the emissions in the period. If they do not have a quota to cover the emissions in the subject year, then through the application of the principle of best estimate, provisions must be generated for the lacking volume.

2 The Established Practice for the Accounting of Emission Rights

Painting a brief picture above in relation to the problems of emission rights disclosure and assessment underlines the justified requirement of companies involved in emission trade for clear guidelines in the accounting for emission rights [9]. In the following discussion, we shall review and analyse different solutions, and then by means of an example, we shall attempt to shed light on the conclusions that can be drawn from these methods. We examine how the proposals issued by the governments and professional accounting bodies of four countries affect the financial statements of companies. These proposals were issued by the following institutions: Instituto de Contabilidad y Auditoría de Cuentas (ICAC) in Spain [21], the Institut Deutscher Wirtschaftsprüfer (IDW) in Germany [13], the Austrian Financial Reporting and Auditing Committee (AFRAC) in Austria [1] and the HM Treasury [11] and the Department of Health [1] of the Government in Great Britain.

2.1 The Place of Emission Rights in the Balance Sheet

The emission rights are presented in each of the examined accounting models, and they appear in the statements, but their balance sheet classification and valuation can be very different depending on the statutory provisions of each nation and the

related opinions issued by various accounting bodies. Therefore, emission rights are shown within the non-current assets as intangible assets and also among the current assets.

According to the IDW model, the AFRAC model, and the UK fair value model, the emission rights are intangible assets which are to be presented in the balance sheet among the current assets [1] [1] [13]. According to the guideline, in the IDW model, the emission rights associated with the production process must be shown as inventories, and the other emission rights as other current assets [13]. In the AFRAC model, the emission rights are other current assets [1], and in the UK fair value model current asset investments [1]. In the ICAC model, emission rights are shown in the balance sheet within the non-current assets as intangible assets [21]. In Switzerland, Leibfried and Eisele present the emission rights in the balance sheet as non-current assets, among the intangibles [16].

2.2 The Initial Recognition of Emission Rights

The first recognition of emission rights depends on whether the entity has acquired the rights against a fair consideration or free of charge (or at a favourable rate) by government distribution. In the case of assets obtained against a fair consideration, practically no deviation is seen among the various solutions: the rights are entered at purchase cost. The IFRIC 3 as well as the British fair value model and the Spanish ICAC model also require showing at the market value the assets obtained without transferring consideration [1] [11] [15]. In the IDW and the AFRAC models, when presenting the emission rights initially, a business organisation may choose from two methods.

- In the German model, in the case of assets received without consideration, i.e., government grants, the assets can be entered at zero value (nominal amount) and also at the market value which prevailed at the time of distribution [13].
- In Austria, the Austrian Commercial Code (UGB) does not provide instructions about the evaluation of assets obtained without consideration. AFRAC, in its publication about the accounting presentation of emission rights, recommends that the rights obtained by a government distribution be capitalised at the market value prevailing at the time of subscription. However, as an alternative solution, in case the expected emission is higher than the quantity of distributed quotas, the entity may disregard capitalising the rights received by a government distribution, but it must disclose information about the market values [1].

2.3 The Initial Recognition of Government Grants

In the examined accounting systems, the initial recognition of government grants is in harmony with the valuation applied for emission rights. In case the emission rights obtained without a consideration is featured in the balance sheet at fair

value, then the government grant is also shown at fair value. If the emission rights are featured at the nominal amount, the government grant also appears in the balance sheet at the nominal amount, rights received without consideration are featured at a zero value.

2.4 The Sale of Emission Rights

The profits of selling emission rights generally fall into the category of operating profits. The only exception is the Spanish regulation, where the profits stemming from the sale of intangible assets appear as an extraordinary profit [21]. The German IDW recommends the presentation of profits resulting from sale as other operating revenues [13]. AFRAC recommends the accounting of sales by the gross method: cancellation is booked in material expenses, and the consideration in the category of sales revenues or other operating incomes [1].

In all accounting systems, simultaneously with the sale when the emission rights are cancelled, the government grant featuring on the liabilities side must also be proportionately cancelled.

2.5 Subsequent Measurement of Emission Rights

Except for the British fair value model, the emission rights were evaluated at the historical cost.

- In the Spanish ICAC model, emission rights are presented within the non-current assets, as intangibles, but the accounting of amortisation is not permitted. Impairment must be accounted for the emission rights if the recoverable amount determined on the basis of IAS 36 is lower than the book value of the assets. Impairment is accounted for as other operating expenses [21].
- Concerning Swiss entities, Leibfried and Eisele found examples for amortisation of emission rights, on the grounds that they have a defined and useful business cycle [16].
- In Germany and Austria, the “strict lower of cost or market” principle is applied in the course of the subsequent measurement of emission rights appearing among the current assets. This means that if the fair value on the balance sheet date is lower than the book value, a write-down is to be made to the fair value at the balance sheet date. In the case of emission rights registered at a market value, obtained by government distribution or purchased by the enterprise, this method is also applied. No impairment may be accounted for assets which are booked at zero value [1] [13].

The British fair value model assesses the emission rights featuring among the current assets at the fair value of the balance sheet date. In this case, revaluation is done against the government grant and not against the revaluation surplus [1].

2.6 Provisions Recognised to Deliver Allowances

The value of liabilities and provisions recognised to deliver the allowances corresponding to the actual emission of the period may show deviations in the financial statements. Basically, provisions can be generated in two ways, by the gross and net methods (IAS 37). The withdrawn IFRIC 3 used the gross approach, and showed the balance sheet date obligation corresponding to the actual emission at a fair value to be determined by the best estimate [15]. The difference between the evaluations of assets and provisions caused the striking problem that the profit impact associated with the given period appeared in several periods and therefore the underlying assumption of accrual basis was violated. For overcoming this problem, several solutions were developed in practice, as reflected also by the accounting recommendations of the examined nations.

- In Germany, Austria and Spain, an attempt was made to determine the recognition value of provisions (liabilities) in a way that the deviation between the book value of the rights to be transferred and the value of provisions is minimised. In determining the recognition value of provisions, the German and Spanish guidelines set out from the assumption that first the rights obtained through government grants are used up, and hence the historical cost of these rights is taken into consideration in the value of provisions, even if the historical cost of the rights is zero (see German nominal value model). In case the entity has obtained less emission rights through government grants than the actual emission, then as the next step, when determining the amount of provisions, it must take into consideration the historical cost of the emission rights purchased. If the entity has not bought in the reporting period additional emission rights, then according to the German guidelines, provisions for the missing quantity of rights are to be generated at the balance sheet date fair value of the emission rights, while the Spanish guidelines specify the application of the best estimate which can differ from the balance sheet date value. According to AFRAC 's guidelines, the determining of liabilities or provisions must follow the accepted cost formula (FIFO, weighted average, etc.) applied decreasing the emission rights, and the missing quantity of emission rights must be entered at the market value at the balance sheet date [1] [13] [21].
- Based on the guidelines of the British fair value model, provisions must be generated for the quantity of rights to be handed over, and the value of provisions must be determined at the fair value at the balance sheet date. Since the emission rights and the government grants are to be revalued to the balance sheet date fair value, at the time of handover – if the rights necessary for handover are available to the entity already before the balance sheet date – no difference is generated between the book value of the emission rights to be handed over and the value of recognised provisions [1]. A difference only emerges if the historical cost of the emission rights obtained (purchased or granted) after the balance sheet date deviates from the fair value of the balance sheet date.

2.7 The Subsequent Measurement of Government Grants

The German, Austrian and Spanish guidelines describe that the incomes resulting from the cancellation of government grants should be shown simultaneously with the provisions recognised to deliver allowances, the impairment accounted for the emission rights and the expenses arising due to the cancelling of emission rights [1] [13] [21].

According to the English fair value model, the value of government grants changes in the course of the subsequent measurement with the value of granted emission rights featuring in the balance sheet. A change in profit is only achieved if expenses in association with the emission rights were accounted for in the relevant period [1].

2.8 Deliver of Allowances

In general, the entities settle the accounts in accordance with their actual emissions with the responsible state authority in the business year following the reporting period. When the rights are handed over, simultaneously with the cancellation of rights, the provisions (liabilities) generated must be eliminated. A profit impact emerges if the book value of the assets to the cancelled deviates from the value of the provisions (liabilities). In the case of examined accounting recommendations and national regulations, this profit impact influences the reported operating/business profits of the entity [1] [1] [13] [21].

3 Case Study for the Accounting of Emission Rights on the Basis of the Presented Accounting Practice

In the following discussion, we shall show examples based on the German IDW and the British DH recommendations, as well as the Spanish ICAC resolution of 2006, regarding the accounting practices in relation to the emission rights.

Example⁶: In a government grant, a quota corresponding to 13,000 tonnes of CO₂ is credited to the account of an entity; the entity does not have a quota brought forward from previous years. At the time the quota is credited, the market rate of quotas is CU10. The entity's business year coincides with the calendar year. It draws up an interim report with the end date of 30 June, when the market value of quotas is CU12. Until the end date of the interim report, the entity emitted 5,500 tonnes of CO₂, and the expected annual emission is 12,000 tonnes. The entity sells in the first six months of the year a quota corresponding to 1,000 tonnes, at

⁶ Prepared on the basis of IFRIC 3

CU11.5. On and after the year-end date, when the emission rights are delivered, the market value of the quotas is CU11.

If the interim financial statement prepared in accordance with the various national solutions are compared with the original IFRIC 3 interpretation (Table 1), it is found that the total assets calculated according to the cost method crops up again in the German market value based model and according to the Spanish ICAC resolution, while the British fair value model results in the same balance-sheet total as the revaluation model in IFRIC 3. The entities keeping their books on the basis of the German nominal amount method significantly deviate from these methods. In their case, neither the emission rights nor the government grants appear in the balance sheet, and therefore this value is missing also from the balance sheet total of the entity.

The national guidelines recommend the gross method for the assessment of provisions [13] [21], but their values show deviations in the interim reports from the value recommended by IFRIC 3 which also used the gross method – except for the English model [1] [11]. The deviation is the consequence of the various measurement methods. In the German and Spanish models, the provisions – in harmony with the measurement procedure applied for the emission rights – are presented in the balance sheet at the historical cost of the emission rights. (Also in the German nominal amount method, but the value of provisions is zero, because the emission rights obtained as grants are also entered at this value). Again no mismatch emerges in the British model, because both the emission rights and the related provisions are evaluated at the balance sheet date fair value.

Deviations can be experienced also in the value of government grants. The balance sheet value of government grant is identical in the German market value based model and the Spanish model with the corresponding value based on IFRIC 3. The government grants are presented at the fair value of the emission rights at the grant date. In the case of the German nominal amount method, in accordance with the value of the emission rights, the balance sheet value of the government grant is zero. In the English fair value model, the balance sheet value of government grant is also in harmony with the value of the emission rights, and the government grants are shown at the balance sheet date fair value.

In all the three national models it can be seen that the balance sheet value of the emission rights is equal to the sum of balance sheet values in the liabilities side provisions and government grants category. Consequently, the national models – partly following a different practice – eliminated the mismatch resulting from the deviating measurement of liabilities and assets in the IFRIC 3 interpretation. The impact made on the profits is also unambiguous: the interim financial statement presents the actually realised profits stemming from the sale of emission rights. The difference is spectacular in comparison with the IFRIC 3 interpretation. While the business events of the first six months demonstrated in the example generated CU500 profits according to IFRIC 3, on the basis of the accountings of national

models this profit is uniformly CU11,500. Except for the Spanish method, this profit is manifest in the profits of the operating and business activities. In the Spanish model, the sale of intangible assets is qualified as an extraordinary event, i.e., it appears as an extraordinary profit.

The following explanations can be attached to the balance sheet values at the balance sheet date according to the national guidances. In the German market value method [13] and also in the Spanish method, the emission rights are featured at the historical cost [21]. According to the German nominal amount method, the balance sheet value of the emission rights obtained as a grant is zero. The British model shows the rights consistently at the balance sheet date fair value. The balance sheet date value of a government grant is zero in each method, because the grant has been used in the business year [1] [13] [21]. The balance sheet value of provisions is in line with the measurement method of emission rights. It can be noted in each method that the balance sheet value of provisions is CU5,500 higher than the balance sheet value of emission rights. And this amount is nothing else but the estimated value of the quota applying to the 500 tonne emission missing on the balance sheet date. This expense practically erodes the first six-month profits of the entity shown in the example. Already in association with our example related to the IFRIC 3 interpretation we have stated that the accumulated profit impact was CU6,000 (Table 1). This accumulated profit is shown generally in the national reports within the operating profit. The only exception is the Spanish statement, where the profit impact resulting from the sale of intangible assets is shown in the extraordinary profits [21].

In the case of IFRIC 3, in the statements of the business year following the balance sheet date, a significant profit impact appears in association with the previous year's accounting period of the quotas. In the financial statements based on the national guidances, however – in the case of an appropriate estimate – the profit impact indeed appears in the period with which it is associated and it does not influence the profits of the subsequent business years. This means that the examined national guidances eliminate the deficiency which IFRIC 3 has been accused of, because in this case the underlying assumption of accrual basis is manifest.

3.1 Models Based on Recognising Provisions by the Net Method

In this section, we extend our case study through two different accounting methods based on international accounting standards (Table 1); the government grants are presented at a fair value in the first one (GGA method) and at nominal amount in the second one (NAA method). In both cases the provisions are measured by the net method (on the basis of Leibfried *et al.* [16] and Lorson *et al.* [17])

Table 1
Accounting models for emission rights

	IFRIC 3		Germany (IDW)		AFRAC Market value model	Spain ICAC model	UK value model	Provisions - net method	
	Cost model	Revaluation model	Market value model	Nominal amount model				GGA model	NAA model
Interim balance sheet									
Intangible assets (non-current)	120000	144000				120000		120000	
Inventories			120000						
Cash	11500	11500	11500	11500	11500	11500	11500	11500	11500
Other current assets					120000		144000		
Total assets	131500	155500	131500	11500	131500	131500	155500	131500	11500
Profit for the year	500	500	11500	1500	11500	11500	11500	11500	11500
Revaluation surplus		24000							
Provisions	66000	66000	55000		55000	55000	66000		
Government grants	65000	65000	65000	10000	65000	65000	78000	120000	
Equity and Liabilities	131500	155500	131500	11500	131500	131500	155500	131500	11500
Balance sheet at the year end									
Intangible assets (non-current)	120000	132000				120000		120000	
Inventories			120000						
Cash	11500	11500	11500	11500	11500	11500	11500	11500	11500
Other current assets					120000		132000		
Total assets	131500	143500	131500	11500	131500	131500	143500	131500	11500
Profit for the year	-6000	-6000	6000	6000	6000	6000	6000	6000	6000
Revaluation surplus		12000							
Provisions	137500	137500	125500	5500	125500	125500	137500	5500	5500
Government grants	0	0	0	0	0	0	0	120000	
Equity and Liabilities	131500	143500	131500	11500	131500	131500	143500	131500	11500
Balance sheet at surrender date									
Cash	6000	6000	6000	6000	6000	6000	6000	6000	6000
Total assets	6000	6000	6000	6000	6000	6000	6000	6000	6000
Profit for the year	12000	0	0	0	0	0	0	0	0
Retained earnings	-6000	6000	6000	6000	6000	6000	6000	6000	6000
Equity and Liabilities	6000	6000	6000	6000	6000	6000	6000	6000	6000

Applying the net method, no provisions are presented in the interim report, because the emission rights available will cover the actual emission [16] [17]. This measurement method of provisions – in case of the GGA method – makes an impact on the valuation of the government grant also: the deferred income is not cancelled because no expenses arise. The NAA method leads to a result identical with that of the German nominal amount method, because in that case the generated provisions – which will be zero at the time of applying the nominal amount – are determined based on the historical cost of emission rights.

In the case of the GGA method, it can be seen that the government grant which should appear as deferred income is also featured in the balance sheet on the balance sheet date at the market value at the grant date. This raises doubts, because pollution emission exceeding the government grant took place in the period, i.e., it would be justified to eliminate the government grant as a deferred income. This problem does not prevail in the case of the NAA method, because both government grants and emission rights are shown at zero value.

To summarize, in these models the full accumulated profit impact appears in the business year when the distributed quotas are actually used. In the subsequent year, when the rights are actually delivered, no profit impact is booked, when the emission rights, the generated provisions and the amount of government grant are cancelled against one another. In the NAA method, due to the zero value of the emission rights and the received grant, the purchased emission rights and the provisions have to be cancelled.

4 The Main Questions and Answers Relating to the Accounting for Emission Rights

On the basis of the presented models, the following main questions are outlined in association with the accounting for emission rights.

4.1 Emission Rights: Non-Current Assets or Current Assets?

Of the emission rights purchased or obtained through a government grant, those rights must always be classified as current assets which are realised within 12 months after the reporting period, in accordance with the definition of standard IAS 1 Presentation of financial statements. Can the rights reserved for a longer period be considered as non-current assets? IAS 1 (68) emphasises that the inventories “that are sold, consumed or realised as part of the normal operating cycle” must be shown among the current assets even if their realisation is not expected within 12 months after the reporting period. Could this cover the emission rights?

From the definition of inventories in IAS 2, it is unambiguous that emission rights held for a sales purpose are qualified as inventories, but the question is, can rights held for own use be treated as inventories? The emission rights relating to the production process behave like “materials and supplies” that are consumed in the production process. In case the emission rights held for use can also interpreted as inventories, then – according to IAS 1 – they must be presented as current assets, regardless of the intended period of use. The most common argument against recognising the emission rights for use as inventories is that these rights do not have a physical substance [19]. Presenting goods without physical substance among the inventories is commonly used, but if an asset without physical substance behaves as a material, this approach is indeed unusual. In this case, users may refer to the substance over form principle.

4.2 Government Grant and the so Obtained Emission Rights: at Fair Value or Nominal Amount?

The countries that permit accounting on the basis of the nominal amount method generally specify a disclosure obligation. Therefore, the necessary information about market values are available in the notes. [1] [13] In our view, it would globally better enhance the comparability of financial statements if these data appeared in the balance sheet.

4.3 How should the Subsequent Measurement of Emission Rights Take Place?

With the emission rights treated as inventories, the subsequent measurement can be brought in accordance with the IAS 2 regulations about the subsequent measurement of inventories: the inventories must be evaluated at the lower of the historical cost and the net realisable value. If the realisable value is below the historical cost, the value of the emission rights must be reduced to the lower market value. The realistic assessment of the emission rights and hence their revaluation to a higher market value is not possible on the basis of IAS 2.

4.4 Recognising Provisions by the Gross or Net Method?

We have demonstrated with the GGA method that as a result of the net approach of generating provisions, government grants are not fully eliminated at the end of the period because of the lack of relating expense, although it could be necessary based on the actual emission of greenhouse gases. In this case, the government grant is practically not a deferred income.

4.5 How should Provisions and Government Grants be Evaluated?

Government grants imply that the emission rights are based on subsidies, and therefore it is obvious that the grants should be presented in the balance sheet at the same value as the rights. The provisions – if they are shown by the gross method – embody liabilities applying to the handover of rights in association with a periodical emission. This obligation may apply also to emission rights obtained by a government grant, and in this case the debt part related to the handover of these rights must be featured at the same value as that of the assets serving as a coverage. If there is no harmony between the evaluations of the assets available and the liabilities associated therewith, this leads to mismatch; the most striking appearance of this is that the profit impacts do not appear in the period to which they actually relate, violating by this the underlying assumption of accrual basis. The national models examined during the research found various solutions for this problem.

We attempted to find a consistent solution for our proposals above also in the subsequent measurement of provisions and grants. The government grant and the so obtained emission rights must be presented at the same value in order to avoid any mismatch. In the course of a subsequent measurement, it may happen that the value of emission rights is reduced to the net realisable value, the government grant is cancelled simultaneously, and therefore the emission rights obtained by a grant and the government grant are featured at the same value in the balance sheet. A government grant remains in the balance sheet if the emission rights obtained through the grant and associated with the reporting period have not been fully utilised by the entity, i.e., its total emission in the period was below its permitted emission level. The actual emission is reflected by the value of generated provisions. The value of provisions depends on how the level of emission develops vis-à-vis the available emission rights, and how the entity obtained these covering rights.

Let us assume that an entity has emission allowances exclusively stemming from government grants, and they cover the actual emission of the entity. In this case, the balance sheet value of provisions must be equal to the value of emission rights obtained by a government grant and also handed over as a result of the emission. How to proceed if the entity has emission rights stemming from a government grant exclusively, but they do not cover the actual emission? The value of the provisions must be determined in a way that it approaches as closely as possible the value of the rights to be delivered. In case the entity has purchased the missing rights before preparing the balance sheet, harmony in the valuation of assets and liabilities can be created if the provisions are determined jointly at the book value of the rights available on the balance sheet date and at the historical cost of the missing rights obtained after the balance sheet date. If the entity obtains the missing rights after the reporting period, the value of provisions regarding the

missing rights must be determined with the best possible estimate based on the most precise information available at the time of preparing the balance sheet. The best estimate does not necessarily equal the balance sheet date market value of the emission rights.

In case the entity obtained the emission rights not only through a government grant, the value of provisions must be determined on the basis of the book value of available rights obtained or purchased. In case the available rights do not cover the actual emission, provisions must be generated for the missing rights through the application of the principle of best estimate. However, the situation raises many questions when the entity has more emission rights than necessary for the actual emission: How are the provisions determined and which value of the rights is to be considered as the basis for measurement?

It is only a seemingly appropriate solution to determine the provisions in such a case by the cost formulas of IAS 2, moving average price or the FIFO method, because these methods could again lead to mismatch. The government grant is to be shown as income of the reporting period, to such an extent by which the received grant is actually realised. An equilibrium situation prevails if the incomes realised due to the emission obtained as a grant is counterbalanced by the expenses arising through the provisions generated according to the emission level. This is only possible if the provisions, and hence also the expenses, are determined primarily at the book value of the emission rights obtained as a grant, and the value of the purchased emission rights is only taken into consideration in the value of the provisions if the rights obtained by the grant do not provide a coverage for the actual emission. The value of liabilities applying to the handover of purchased emission rights can then be determined by the moving average price or the FIFO method.

4.6 Where should the Profit Impact Related to the Emission Rights be Shown?

Since the emission of pollutants is part of the production process, regarding the quotas held for sale or usage, it is justified in all cases to present the impact on profits within the category of operating profits. In certain national regulations, the impact made on the profit by certain items is entered as an extraordinary profit. An example could be in Spain the impact made on the profit of selling intangible assets or in Hungary the showing of received grants as extraordinary revenues. Presentation within extraordinary profit distorts the impact made on the operating profit.

Conclusions

The differing accounting treatment of emission rights causes problems in the field of group accounting and comparability, and also places a very high administrative burden on companies. In our opinion, taking into consideration the role of

emission rights in the production process and the relevant specifications of the International Financial Reporting Standards:

- it is justified to show emission rights as inventories,
- it is justified that emission rights obtained through a government grant, the received government grant and the provision should be presented by the gross method,
- the subsequent measurement of emission rights is to be brought in accordance with the standard IAS 2 (Inventories),
- violating the underlying assumption of accrual basis can be avoided if the emission rights, the government grants and the provisions are evaluated in line with each other. To this end, the available emission rights must be reflected in the value of government grants and provisions. If the emission rights do not provide coverage for the actual emission, the liabilities applying to the missing rights must be determined by the principle of the best estimate (Table 2).

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Table 2
Main differences in the national guidelines about the accounting for emission rights

	German IDW models		Austrian AFRAC model		Spanish ICAC model	DH of UK government fair value model	Our conclusion
	Market value model	Nominal amount model	Market value model				
Balance sheet position of emission rights	Inventory/Other current assets		Other current assets	Intangibles (non-current assets)	Current asset investments (intangible assets)	Inventory	
Initial recognition of emission rights granted	market value at the grant date	at zero value	market value at the grant date	market value at the grant date	fair value at the grant date	market value at the grant date	market value at the grant date
Initial recognition of government grants	market value at the grant date	at zero value	market value at the grant date	market value at the grant date	fair value at the grant date	market value at the grant date	market value at the grant date
Recognition of provisions	Gross method - First: carrying value of rights granted, then of rights purchased, and market value at BSD for missing rights		Gross method - The used measurement method (FIFO, weighted average) for existing rights and market value at BSD for missing rights	Gross method - First: carrying value of rights granted, then of rights purchased, and best estimate for missing rights	Gross method - fair value at the BSD	Gross method - First: carrying value of rights granted, then of rights purchased, and best estimate for missing rights	Gross method - First: carrying value of rights granted, then of rights purchased, and best estimate for missing rights
Subsequent measurement of emission rights	Lower of cost or market value at the BSD			based on IAS 36	fair value of emission rights at the BSD, revaluation of granted rights against government grants	based on IAS 2	based on IAS 2
Subsequent measurement of government grants	Decrease of government grants, when expenses are recognised relating to emission rights granted	-	Decrease of government grants, when expenses are recognised relating to emission rights granted	Decrease of government grants, when expenses are recognised relating to emission rights granted	fair value at the BSD - profit impact only when expenses are recognised relating to emission rights granted	Decrease of government grants, when expenses are recognised relating to emission rights granted	Decrease of government grants, when expenses are recognised relating to emission rights granted
P/L Impact	Operating profit		Operating profit and extraordinary profit		Operating profit	Operating profit	Operating profit

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