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EMISSION TRADING SCHEMES AND TAXES

Questions for a possible SEEA CF update

Emission Trading Schemes (ETS) limit the total emissions (cap and trade) and thus aim at increasing their costs. According to national accounts they have a similar economic impact as taxes. Therefore the 2008 System of National Accounts (SNA) recommends that payments for permits relating to emissions into the atmosphere should be recorded as taxes because "*These permits do not involve the use of a natural asset (there is no value placed on the atmosphere so it cannot be considered to be an economic asset) and are therefore classified as taxes even though the permitted "activity" is one of creating an externality. It is inherent in the concept that the permits will be tradable and that there will be an active market in them. The permits therefore constitute assets and should be valued at the market price for which they can be sold.*" (SNA 2008 Paragraph 17.363). The current SEEA CF follows this suggestion (SEEA CF Paragraph 4.115 (ii)). The Twenty-first meeting of the Advisory Expert Group on National Accounts discussed various options to account for ETS, assuming that the atmosphere is an implicit asset (SNA/M4.22/10 - WS.7 Guidance Note on the Treatment of Emission Trading Schemes). Then ETS could be considered as sales of non-produced assets or as a rent payable for the right to use a non-produced asset. The trend in the SNA revision process, however, is that ETS will be considered as a financial asset with taxes on production recorded at surrender. Therefore, it is assumed here for the time being that the ETS after SNA revision will continue to be taxes. But, even without an answer to this question, it is worth to take a closer look at ETS. They become more and more important in environmental policy and have, from an environmental-economic accounting point of view, links to taxes, subsidies and transfers, expenditures as well as to air emission and probably energy accounts. Thus, exploring the treatment of ETS could serve as good starting point for a discussion on integrating accounts as well.

This document describes different types of ETS. It presents the current rules for their treatment according to SNA 2008 and SEEA CF. It furthermore raises a variety of accounting questions about the treatment of different ETS in particular and different matters of environment-related taxation in general.

Application in the environmental-economic debates

Unlike the national accounts, the environmental-economic accounts do not pursue the goal of a complete description of all transactions within the entire economy. They target only those areas where the environment has interfaces with the economy or, where processes are taken within the economy that either have an impact on the environment or at least the goal/intent to do so.

In this approach, emission certificates are particularly relevant

- on the one hand in the debate on ecological tax reforms, i.e. how high is the monetary share of the taxes resulting from the taxation of the use of natural resources[1] or GHG[2]-emissions in the overall economy,
- and on the other hand, for determining individual variables such as emission prices, i.e. the cost intensity of emissions (e.g. € per tonne CO_2) released to the atmosphere for the different market operators.

Thus, environmental-economic accounts have a particular interest in the **government's revenue** from emissions-related measures and **the financial liability of enterprises and private households** to compensate their emissions. While government revenues are based on the amount and price of allowances actually sold by the government, the expenses of companies and households are more likely to be assessed with the prices and quantities of the allowances at the time of emission or surrender. In this setting, tradable certificates, which are issued free of charge (or at a reduced price) by the government to market actors or imported from other countries, are specific cases. On the one hand, they are not revenue for the government; on the other hand, they may impact the cost for companies emitting CO_2.

Different kinds of emission permits

Emission permits can be structured in very different ways. In Germany - for example - several very different systems exist in parallel. These brief descriptions of examples are not an exhaustive list of all the possibilities of emission certificates, but could highlight certain aspects that are relevant to other national or international contexts.:

1. European Emissions Trading Scheme (EU ETS)

This system targets emissions generated by operators of emission-intensive facilities and air traffic. The debtor, who is obliged to submit, in the following year, certificates for the emissions in the current year, is therefore directly the emitter. The EU ETS is a Europe-wide emission cap-and-trade system. Each country can issue a limited number of certificates that can be traded and used throughout Europe to cover emissions. This means that national emissions can be covered with certificates for which another state has generated the revenue and vice versa. For economic policy reasons, operators of certain plants are currently still allocated certificates free of charge, which they can, however, trade freely like purchased certificates. Since the certificates are held in a kind of collective safekeeping, similar to money in bank accounts, it is not possible to determine specifically which certificate *was used to offset which emission*.

2. Carbon Border Adjustment Mechanism (CBAM)

Currently, the EU is setting up a regime to price emissions that are assumed to have been generated abroad. For goods imported into the EU – first for cement, iron and steel, aluminium, fertilisers, hydrogen, electricity – the importer must then surrender certificates to cover these emissions abroad. The price of these certificates is announced to be the weekly average price of the EU ETS.

3. National Emissions Trading Scheme (nEHS)

[1] Even if in the SNA the atmosphere is not considered a resource

[2] Greenhouse gas

The system regulated by the Fuel Emissions Trading Act obliges the distributors of fuels to submit certificates in the following year for the quantity of fuels placed on the market for the first time in the current year. Thus, the debtor in this case is not the emitter who causes emissions by burning the fuels, but the fuel wholesaler, similar to the national energy tax. If the fuel trader delivers to operators of installations that are also subject to the EU ETS, he may deliver the fuel free of certificates or the operator of the installation may be reimbursed the price of the national permits subsequently. *Currently, the price of these certificates, which increases annually, is still fixed, their number is not limited and unused certificates can be returned. However, this is to change in the future.*

4. § 37A - Federal Immission Control Act (BImSchG)

Section 37a BImSchG aims to reduce emissions caused by the combustion of fuels. To this end, the distributors of fuels are obliged to reduce the absolute emissions caused by the fuels they sell each year compared to a reference year. One way they can achieve this is by having emission reductions in other areas credited to them. This can also be done with a third party who assigns (hypothetical) reduction to them. Currently, for example, people who have registered an e-car for public road use or operators of certain public charging stations can have hypothetical emission savings credited to them and sell these. In this case, certificates are issued free of charge to market participants who are not emitters themselves and who can deal in them.

Identified specific characteristics

It becomes very clear that emission certificates can appear in very different and sometimes rather complex forms. Consequently, there are several challenges when accounting them like taxes:

- It is not necessarily the economic unit that releases the CO_2-emission that needs to cover the costs through certificates. At the same time, in multi-country systems, the state on whose territory or from whose units the emissions originate is not necessarily the one receiving the fiscal revenue from the scheme. Strictly speaking – if the ETS continue to be regarded as a tax – there is a taxation (by the government of the exporting country) of a foreign entity abroad (the importer). This makes a clear classification according to territorial or resident concept difficult.
- The period of revenue and emissions can fall in different accounting periods.

This leads to questions about how to deal with the following in particular:

- What is the relevant figure for a period? The acquired or the returned certificates?
- How to deal with certificates acquired or transferred abroad?
- At what price should certificates be value in the accounts? The issue price or a market value at the time of the CO_2-emission or a market value at the return time?
- What should be done with tradable certificates that have been issued free of charge? Are the free allocations, if any, subsidies or another kind of transfers?

- Can emission costs be attributed to economic sectors?

Outline of present guidelines

Some attempts have already been made in the past to include parts of these aspects in the relevant frameworks:

ETS are seen as taxes

The SEEA CF in its current version clearly states that Emission Permits should be considered as taxes: "*If a limited number of permits to discharge or emit are issued with the intent to ultimately restrict the overall quantity of discharges and emissions, the treatment of any payment associated with the permits depends on the ownership of the environmental asset into which the emission has been or will be released:*
(i) Where an economic asset exists following the principles of the SNA (most commonly, this occurs with land and soil) and the necessary conditions are met concerning the terms on which the discharge is permitted, then the payment for the permit should be treated in the same way as the payment for a licence to use an environmental asset;
(ii) Where an economic asset does not exist following the principles of the SNA, then the payment for the permit should be treated as a tax, as is commonly the case with regard to the atmosphere, inland water resources and the seas, and this treatment generally applies to carbon emissions permit schemes." (SEEA CF 4.183 (c)).

Attribution period

Environmental related taxes in general

Revenues from emission certificates are classified as taxes in the national accounts. According to SNA 7.84, all taxes are to be accounted for at the time when the activities, transactions or other events occur that give rise to the obligation to pay taxes. Thus, this point in time does not necessarily also coincide with the point in time of a physical flow into the environment. For example, for fuels whose combustion leads to emissions, the energy tax is regularly booked at the time the fuel is placed on the market and not at the time when the fuel is actually combusted and the emission created.
The SEEA CF does not make any concrete statement at the time of booking taxes. However, it seems self-contradictory on this issue: On the one hand it calls for recording transactions and other flows as occurring at the same point in time in the various accounts (2.136). Ideally, the time of the recording of physical flows should align with the time of recording of the flows in monetary terms using an accrual approach (2.139). This would ensure coherence between energy or emission accounts and tax accounts.
At the same time, however, it says that in monetary accounts, the general principle is that transactions are recorded when ownership changes and the corresponding claims and obligations arise, or are transformed or cancelled. This approach to the time of recording is called an accrual approach (2.137). Thus, coherence with the SNA seems closer than the SEEA CF based accounts with each other. A clarification in the SEEA CF seems appropriate here.

Emission permits

For ETS, the SNA News and Notes Number 32/33 are explicit from the general rules in SNA 7.84 regarding the periodic attribution of ETS[3]: "*The payments for emission permits, issued by governments under cap and trade schemes, should be recorded at the time the emissions occur as taxes, specifically other taxes on production (D29), on an accrual basis*". In the subsequent statements, the SNA news and notes argue for a very simplified treatment of the ETS. A temporal discrepancy between surrender and emissions can be ignored for simplification reasons: "*In practice, however, it can be assumed, for simplicity, that the time the permit is surrendered is the same as the time that emissions occur, as long as there is no significant lag between the two events and the lag is constant.*" This approach is followed by the SEEA CF (4.186). However, it also concludes there that "*For multinational schemes, the situation is more complex; as in any single country, more or fewer permits may be surrendered than the number that were originally allocated to the country*." (4.186 (f)) – without, however, going into a solution here.

Attribution to a country (in case of multi-country schemes)

As with the temporal classification, the SNA news and notes also provides a very simplified view for the geographical classification. In the case of cross-border ETS, it is implied that taxes are incurred on production in Rest of the World (ROW). However, these could be ignored for reasons of simplification.

Sectorial attribution

The SEEA CF does not clearly regulate the allocation of the tax or ETS to individual sectors, but only provides rough orientation: *"For some types of environmental taxes, particularly energy taxes, a breakdown of payments by industry may be relevant. Ideally, an industry breakdown should be aligned to the breakdown used for the recording of related physical flows as shown in chapter III. For example, for energy taxes, an industry breakdown following the industry structure of the air emissions accounts may be relevant."* (4.156)

Emission vs. Energy related

According to the current SEEA CF emission certificates should be treated as an energy tax as long as they are based on CO_2-emissions. If they are based on other emissions, they should be considered as a pollution tax (4.817). Other GHGs are not specifically addressed here.

Synopsis present guidelines

In general, there are already indications in the SEEA CF as well as in the SNA on how emission certificates could be accounted for. However, in the SNA they are rather rudimentary and mainly designed for very simple case scenarios. In the SEEA CF, the problems are more often already recognised, but here, too, there are either no solutions or solutions that have yet to be worked out in detail. Since emission certificates are often not in these simple forms today, more comprehensive considerations should be included in an updated SEEA CF.

[3] SNA News and Notes Number 32/33- March 2012

Thoughts to be discussed

General issues with environmental taxes (incl. ETS when treated as such)

Whom to allocate a tax?

The question of to which unit or sector the payment to the government should be allocated affects both ETS in particular and environmental taxes in general. In environmental economic accounts the tax is not always attached to the unit that actually owes the tax to the government. This often applies, for example, to the taxation of fuels where the sector of the economic unit that emits the CO_2 through combustion is considered the relevant unit. (SEEA 4.156). This allocation rule may also be relevant for ETSs if they are not levied directly on emissions but on fuel sales. Here, however, it is relevant that the allocation matches the corresponding comparative value in the physical accounts. However, this can be different. For example, taxes on CO_2-emissions – which currently belong to the energy taxes – may have to be compatible either with the energy flow accounts or with the emission accounts. How can this be ensured? Or do we need different attributions according to areas of application?

What kind of tax?

The issue of allocation is also directly related to the question of what kind of environmental tax an ETS should actually be. SEEA CF suggests four different kinds of environmental taxes. Nevertheless, there is no clear general rule in the SEEA CF as to what should actually be allocated to energy, transport, resource or pollution. In essence, energy taxes are linked to a product (fuel), transport taxes to a use (transport), pollution taxes to an effect (pollution) and resource taxes to a process (extraction of a resource). But since these are four different dimensions, there may be generous overlaps here.

Although SEEA CF (4.155) states that CO_2-related taxes are to be recorded under energy taxes, this classification leaves some questions remaining: On the one hand, CO_2-emissions are not necessarily associated with the combustion of fuel. They may also apply to CO_2-emitted from other chemical processes. On the other hand, it is said that they are energy taxes, but they are to be allocated according to emitter (SEEA 4.156), which is a slight contradiction.

Issues related specifically to ETS

What to treat as CO_2-tax (and how to do it): the primary auction market or redeeming certificates?

The AEG/ISWGNA seem to follow the idea, that in the SNA revision a kind of mix of both views could be established: “Recommendation to record emission permits as a financial asset with taxes on production recorded at surrender.” Let’s have a closer look at the different options.

In general, either the primary auction market or the handing in of allowances could be regarded as a CO_2-tax. The first has the advantage of matching state revenues exactly. However, these revenues may not necessarily fit (domestic) offset emissions. And this seems necessary, for an environmental tax is a “tax whose tax base is a physical unit (or a proxy of a physical unit) of something that has a proven, specific negative impact on the environment”. And with the exception of the state revenue, the sale of emission certificates lacks any other tax characteristics as well: There is no obligation for enterprises to purchase certificates directly from the domestic government. Rather, they

have the opportunity to acquire them in a variety of ways - on the secondary market or primary markets abroad. And the obligation to the government is not to buy but to redeem.
Therefore, the redeemed certificates may be closer to an environmental tax than the primary auction. The redemption is obligatory and is directly related to an actual physical unit, the CO_2-emissions. In this case, therefore, the tax payment would not be made in money but in certificates. It would therefore be a non-monetary - like the church tithe in the Middle Ages - natural tax.
The simplest solution to monetarise this would be to regard the market value of the redeemed certificates as the tax. However, among the returned certificates there may also be those that originate (also net) from abroad or that were issued free of charge by the state and now have the same marked value as those sold by the domestic government. This now raises the question of the "tax status" of such certificates that never created any monetary revenue for the government. In other words, if the handing in of certificates is considered to be the tax,

- how are they to be valued?
- how to deal with free or imported/exported certificates so that the government revenue, the handed-in certificates and the expenditure of the sectors make sense.

Valuing them only at the issue price is therefore of no help here. And if these issues are ignored, the government's revenue and the burden on companies, as reported in the balance sheet, may otherwise be overestimated due to free certificates. This overestimation can only be countered

- if the free certificates either reduce the overall valuation - which can lead to misallocations in respect of the sectors in the case of unequal distribution - or
- if free certificates were at least treated as transfers.

This would basically lead to a balance sheet extension: Higher taxes and higher transfers – which can take the different sector distribution into account. However, this would not solve the problem in case of a surplus of foreign certificates used and accrual carry forwards. The question therefore arises as to how these can be counterbalanced so as not to overestimate the state's revenues. There would have to be a payment to ROW - but by whom? The government, which collects the certificates, had at this point precisely no relationship with foreign countries. And the certificates also virtually dissolve when they are returned. Or should multinational ETS receive another (virtual) layer representing the multinational ETS (distributing the certificates to the governments and returning them to it after use by the governments). And what would this layer be in the national accounts?

Free certificates - subsidies?

"Subsidies are current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services that they produce, sell or import." (SNA 7.98). It is certainly undisputed that in the case of the EU ETS free certificates are certificates that are given by the government to enterprises on the basis of their production activities. In other cases, as in case 4 described above (§ 37A - BImSchG), it could also be a matter of transfers to households. However, a transfer of free certificates is not a cash payment. Rather, the transferred certificates have – similar to securities –

a market value. Thus, it could be seen as a transfer of capital in kind. For this to happen, however, the certificates would first have to be recorded as a non-financial asset in the accounts of the donor (SNA 10.204) – what they were previously probably in terms of quantity, but not in terms of value.
As a crutch, it could be assumed that the value was recognised at zero value by the government and that a price gain only arose as a result of the transfer to the market. It would therefore be an "other changes in assets accounts" for the enterprise (or comparable with private households). But this would not help us much (see paragraph above) in terms of offsetting the certificates with the state at the time of redemption – They would have been booked out at the government with zero and now come back to the government with a value.

If ETS are to be treated as taxes, another aspect might oppose the treatment of free allowances as subsidies. Tax breaks are generally not seen as subsidies because they are not based on payments by the government to enterprises. Why should this be the case with ETS if ETS are regarded as taxes? In such a view, the free allowances - at least as far as they are needed to cover one's own emissions and do not go beyond that - are nothing more than a tax relief. However, if the tax is considered to be the redemption of the certificates, it is necessary in a mark-to-market valuation to counterbalance this with the issue of the free certificates.

Treatment of certificates issued abroad

The simplification suggested by SNA might be sufficient for national accounts purposes. However, it is not sufficient for the purposes of environmental-economic accounting, which involves much more detailed considerations. For example, under the EU ETS in Germany, only half as many certificates are issued as are surrendered. So, in return, there must also be states in Europe with a (considerable) “export surplus” of certificates. In the case of the EU ETS certificates are held in a kind of collective deposit. Therefore, it is not possible to track certificates individually - similar to a giro account, where individual banknote numbers cannot be tracked either. Only netted changes are visible.
Depending on the decision as to what the tax actually is (auction or redemption), the question therefore arises as to how these foreign certificates should be dealt with. If the sale is decisive, what about certificates redeemed abroad? If it is the redemption, what are the foreign certificates for the companies and what for the government that collects them?

Alternatives to treating ETS as a tax

Are CO_2-certificates a tax at all?

If free certificates and foreign certificates, together with certificates sold by the domestic government, can be used by enterprises to compensate for emissions, and it is impossible to reconcile them meaningfully with the government's monetary revenues, the question must inevitably arise as to whether emission certificates (particularly when in such a complex form) should be considered a tax at all or not. And there seem to be many good reasons not to do so. But what would be a possible alternative?

Balancing ETS in CO_2

What all ETS have in common is that emission certificates always represent a certain mass of CO_2 or GHG to be emitted and compensated. Therefore, it could make sense, as a first step, to account for these certificates in CO_2 or GHG units rather than in monetary terms. This approach (already

proposed in the SEEA CF Table 4.10), would have to be expanded to include the aspect of import and export.
Restricting accounting to physical units in the first place would mean that one would not be confronted with the question of the treatment of different prices, price changes or origins and would thus simplify the consideration considerably. It would be comparatively easy to draw up a physical balance of certificates (to compensate for a certain tonnage of CO_2 or GHG emissions). The allowances issued domestically in a given trading period minus the emissions offset domestically in that trading period up to the beginning of period t are the stock at the beginning of the period under consideration. It can be assumed here that this is either zero or above. If it was below this level in the previous period, certificates had to be purchased from abroad up to zero in the previous period. Now, using the certificates issued for the current period minus the certificates surrendered for the current period, the new stock can be calculated. This can again either be negative, zero or positive and gives the following system:

	Opening balance (≥ 0)
+	new certificates sold by the domestic government for period t
+	new certificates issued by the domestic government for free for period t
–	domestically traded certificates to offset emissions in period t
=	coverage of domestic emissions
+	(certificates from abroad minus certificates to abroad) in period t
=	certificates to stock in period t

All information for such an account is regularly known and would describe the topic already rather good. Such a scheme should be universally applicable, regardless of whether the ETS is only national and whether certificates are sold or given away for free.

The London Group is invited to discuss:

Taxes in general

1. Is the division into energy, emissions, pollution and resource taxes still appropriate? Or do we need another breakdown (e.g. CO_2-related class) here, one at all, or possibly a more flexible one?
2. SNA 7.84 as well as SEEA CF 2.137 suggest an (economic) accrual approach (when the legal obligation for taxation arises) for the allocation of taxes to a period while SEEA CF 2.136/2.139 suggests a more (ecological) accrual one (monetary flow equal to the period of the relevant physical flow). What if these periods are not identical? How can we ensure coherence with both the SNA and the physical accounts, and should SNA (or physical accounts) be given priority in case of doubt?
3. Do we need a clearer regulation in the SEEA CF as to which economic unit a tax should be specifically allocated to (e.g. in the case of CO_2-emissions from electricity generation) and how can we ensure coherence with the physical accounts?
4. Do we need different attributions depending on the comparison and how do we clearly label them?

ETS in particular

1.a If ETS are taxes (to be discussed together) …
   - … is their auction or redemption the relevant thing for us?
   - … are free certificates subsidies?
   - … are foreign certificates taxes or something else?

1.b … or is it only a workaround to consider ETS as a tax? Should we treat and present ETS separately due to their market-like structure?

2. If in an ETS not the CO_2-emitters but the sellers of fuels are obliged to redeem certificates: To which sector do we then allocate the costs – and if to the CO_2-emitters, how do we then deal with a possible stock of certificates?

Does the London Group agree that in a SEEA CF update …

1. … we should treat and suggest presenting ETS specific (and separate) from taxes?
2. … we should reconsider the split into different kind of environmental taxes?
3. … we should make a clear suggestion to what sector taxes should be allocated to?
4. … we should make a clearer suggestion on the accrual accounting of taxes?
5. … we may need rules for different allocations (and should clearly label them) for issues 3. and 4. depending on further uses?