



Tradable allowances and the environment

The whys and wherefores of trading systems for CO₂ and NO_x emission allowances, fishing quotas, milk quotas and animal allowances: an explanation in the form of 25 questions and answers





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Summary

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Since the mid-1980s, the Dutch government has used a system of *tradable allowances* as a tool of government policy on environmental protection. 'Tradable allowances' is the name given to permits granted by the government to private companies to do something, up to a given limit, that is harmful or potentially harmful to the environment. This may mean emitting carbon dioxide (CO₂), keeping livestock that produce manure, or catching large quantities of marine fish. The companies holding such permits are entitled to sell them to other companies. By answering a number of basic questions, this report describes the conditions that need to be met in order for a system of tradable allowances to function effectively.

Tradable allowances as a policy tool

A system of tradable allowances works as follows. The government first sets a maximum value for the amount of environmental damage that certain activities are permitted to cause. Ceilings are set, for example, for the quantities of certain species of fish that fishing vessels are allowed to catch, for the size of the national cattle stock, and for the quantity of CO₂ emissions. The next step is to break this maximum volume into portions (i.e. allowances), which the government then distributes among the companies in question. If a company subsequently exceeds the number of allowances it has been allocated, it must buy additional allowances from companies that have a surplus. In this way, the total value of CO₂ emissions, the total size of the national cattle stock or the total fish catch does not exceed the agreed ceiling and a limit is placed on net environmental degradation.

Tradable allowances are a means of forcing those companies that cause environmental damage, either as a result of pollution or in another way, to pay a form of compensation. They have a choice: either they can adopt more efficient or cleaner production methods or they can buy up extra allowances. If it is cheaper for a company to operate more efficiently or to build a cleaner production line, it can then sell the allowances it saves to other companies for whom adapting their production methods is a relatively expensive option. The tradability of



the allowances means that the potential environmental damage is limited by those companies that are able to do so at the lowest possible cost. 2

Important points to consider beforehand

Before the government decides to introduce a system of tradable allowances in a particular industry as a means of protecting the environment, it must first weigh up its pros and cons as a policy tool compared with other potential instruments. If the government decides that tradable allowances are indeed the best option, the tool must then be 'made to measure'.

Whether it is worth setting up a system of tradable allowances depends on a number of factors, one of which is whether the market that the government wishes to create potentially satisfies a number of important conditions. For a start, it is crucial that all market players have access to sufficient information to enable them to operate properly. This information must be easily accessible, and at a low cost. A second key condition is the presence of a large number of market players. Thirdly, trade must not be impeded by all sorts of barriers that prevent both existing participants from operating and new entrants from joining the market.

In practice, a system of tradable allowances is generally just one of the policy tools that the government uses to achieve a given social impact. That's why, before adopting such a system, the government must give careful consideration to the mutual interaction between the system of tradable allowances it is planning to introduce and the other policy tools it is already using in the field in question.

Finally, the government also needs to decide beforehand how it wishes to distribute the allowances, i.e. are they to be distributed free of charge or auctioned? Both options come with their pros and cons and these need to be weighed up against each other. One of the pros of an auction system is that it generates revenue for the government. In practice, however, auctions have signally failed to do so to date. For the time being, allowances are distributed free of charge.

Once the allowances have been distributed, trading can start and a 'market' comes into being. The government's main responsibility at this stage is to make sure that tradable allowances and the market in them are both able to mature. The government should intervene only if the tool does not operate properly once the market has fully developed.



The government's job is also to make sure that the rules and regulations associated with the use of the allowances are enforced and obeyed. Tradable allowances systems may be undermined not only by fraud, but also by criminal activities such as money-laundering and theft by means of 'phishing'. 3

Characteristics of the five systems of tradable allowances currently used in the Netherlands

The five systems of tradable allowances currently used by the Dutch government for the purpose of protecting the environment are described in this document by way of illustration. As part of the government's policy on manure, *animal allowances* (i.e. pig and poultry allowances) and *milk quotas* place a cap on the number of animals livestock farmers are allowed to keep. The *fishing quota* limits the size of catches of marine fish. *Emission allowances* place limits on the quantity of toxic substances industrial companies are permitted to emit, particularly greenhouse gas (i.e. CO₂) and nitrogen oxides (NO_x, which lead to soil and plant acidification).

All these systems of tradable allowances are currently undergoing adjustment or are in the process of being wound up.



	CO₂ emission allowances¹	NO_x emission allowances	Animal allowances: Pigs Poultry	Milk quota	Fishing quota
Situation on 31 December 2013					
Plans for termination or adjustment?	EU planning review	Due to be wound up in 2014	Possibility of system being wound up in 2015 now under discussion	Due to be wound up by EU in 2015	EU planning review
Compliant with EU regulations?	Yes	Yes	Yes	Yes	Yes
Choice of policy tools?	Yes	No	No	Yes/No ²	No
Year of adoption	2005	2005	1998	1987	1983
Method of distribution	Free	Free	Free	Free	Free
Number of participants	370	350	6,500 2,400	18,500	500
Number of allowances ³	437 million	57.9 million	8.9 million 67.5 million	11.8 billion	300,000
Price of an allowance	€7	€0.10	€65 €6	€0.19 per kg of milk	Not known
Total value	€3 billion	€5.8 million	€1 billion	€2.2 billion	Not known

¹ The figures in the column are for the Netherlands only.

² The system was introduced by the European Union (EU) in order to curb milk production in the EU. As it implicitly imposes a ceiling on the size of the national cattle stock and hence on the production of manure, it is regarded in the Netherlands as being equivalent to the other animal allowances and as supporting the country's compliance with the European Nitrates Directive and Water Framework Directive.

³ One allowance entitles the holder to emit either one tonne of CO₂ or one tonne of NO_x, as the case may be. There is no direct link between the number of animal allowances and the number of animals a livestock farmer is allowed to keep. The allowance is related to a statutorily predetermined amount of nitrate and phosphate produced by a pig or chicken. This means that a specific, statutorily defined number of allowances needs to be obtained for each category of pigs and poultry. A milk quota entitles the holder to produce 1,000 kg of milk with a given fat content per annum. The figure for the fat content is fixed every year. The variation in the fat content over the years leads to a similar variation in the size of the quota. A fishing quota gives the fishing industry permission to catch a given quantity of a certain species of marine fish in a given part of the sea. The precise size of the quota is based each year on the total allowable catch (TAC) set by the European Commission for the year in question. The ceiling varies from year to year, depending on the forecast sizes of fish populations.



1 Introduction

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Since the mid-1980s, the Dutch government has used a system of *tradable allowances* as a policy tool for protecting the environment. 'Tradable allowances' is the name given to permits granted by the government to private companies to do something, up to a given limit, that is harmful or potentially harmful to the environment. This may mean emitting carbon dioxide (CO₂) or nitrogen oxides (NO and NO₂, together referred to as NO_x), keeping livestock that produce manure, or catching large quantities of marine fish.

If the amount of environmental damage caused by a particular company is less than the amount covered by the allowances it owns, it is entitled to sell its unused allowances to other companies. Companies that are planning to cause more damage than the value of their allowances, on the other hand, must buy additional allowances. Because the total number of allowances in circulation is limited, the idea is that the price of the allowances should encourage industrial companies to adopt more environmentally friendly production techniques.

1.1 Aims and target audience of this document

This document describes the conditions that need to be met in order for tradable allowances to work effectively as a tool of government policy. Our aim is to help the House of Representatives in deciding whether or not to make use of tradable allowances as a policy tool in certain situations. Once the House has decided to adopt a particular system of tradable allowances, the members of the House can then use this document to decide what type of allowance system to introduce and how it is to operate in practice.

A tradable allowances manual was compiled in 2000, in response to a government request as part of the government's 'Market Forces, Deregulation and Quality of Legislation' programme. Unfortunately, the manual was very concise and has now been removed from the government website. Moreover, things have moved forward over the past 13 years, with important new developments now affecting all types of tradable allowances used by the government as a means of protecting



the environment. Tradable allowances will remain a key part of the government's environmental policy tool-kit in the future. Against this background, this document summarises the main conclusions on the effective use of tradable allowances.

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This document is based on material in the public domain, including audit reports previously published by us (our website, www.courtsofaudit.nl, contains a full list of the sources consulted for the purpose of producing this document). Our intention is not to pass judgement on individual cases, or on the way in which tradable allowances are used. We have tried to produce an accessible reference work that answers the questions exercising members of parliament and other interested parties who are not familiar with this complex subject matter. This means that we have omitted references to technical details, academic qualification and scientific debates. We have also done our best to minimise the amount of jargon used.

1.2 Scope

This document deals with the five systems of tradable allowances currently employed in the Netherlands as a means of protecting the environment. As facets of the government's manure policy, *pig allowances*, *poultry allowances* (together referred to as 'animal allowances') and *milk quotas* place a cap on the number of animals livestock farmers are entitled to keep. The *fishing quota* limits the size of the fish catch. *Emission allowances* place limits on the quantities of toxic substances that industrial companies are permitted to emit, particularly the greenhouse gas CO₂ and acidic nitrogen oxides (NO_x).

Not all systems of tradable allowances used in the Netherlands are also in use specifically as instruments of Dutch government policy. For example, milk quotas and the CO₂ emissions trading system are both EU policy instruments that have been adopted by the Netherlands in its capacity as an EU member state. The other systems, on the other hand, are national policy instruments, even though the policy in question is intended to ensure that the country complies with EU standards. In many cases, other EU member states have decided to adopt other policy tools in order to meet the same standards. This applies, for example, to fish catches, which other EU member states do not limit with the aid of tradable allowances.



1.3 Current trends

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All five systems of tradable allowances are currently under review or in the process of being wound up. For example, the European Commission is planning to adjust both the CO₂ emissions trading system (ETS) and fishing quotas. The system of milk quotas is also due to be wound up in 2015. The Dutch government has announced plans to scrap the NO_x emissions trading system in 2014 and animal allowances trading in 2015. It should be pointed out that a firm decision on the latter has not yet been taken.

At the same time, a new system of tradable biofuel allowances is currently under development. The plan is to impose an obligation on fuel suppliers to ensure that biofuels make up a certain minimum percentage of their product sales. If a supplier fails to sell enough biofuels, it can make up for this shortfall by buying a quantity of biofuels on paper from a supplier that has sold more than its statutory quota. Our audit did not take in this system of tradable 'biotickets'.

1.4 Format

Chapter 2 of this document describes how tradable allowances work and the thinking behind them. Chapter 3 describes the advantages and disadvantages of an allowances trading system compared with other policy options, and also discusses a number of variants of tradable allowances. The first necessary step in policy development is set out in chapter 4: an analysis of the potential market for trading allowances issued by the government. In chapter 5, we examine the interaction between a system of tradable allowances and other policy tools, and the potential impact that this can have on the effectiveness of government policy as a whole. Chapter 6 focuses on the choice between the free distribution of tradable allowances and an auction system. We discuss the pros and cons of both options. Finally, in chapter 7, we explain what action the government is expected to take after it has issued and distributed tradable allowances. Not only does the market need to be given an opportunity to develop, safeguards must be put in place to ensure that market players comply with the rules.



2 Tradable allowances as a policy tool

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Tradable allowances are marketable instruments in the form of permits issued by the government entitling the holder to take certain action, or to refrain from taking certain action as the case may be. We restrict ourselves in this document to allowances entitling the holder to do something that is either actually or potentially detrimental to the environment, such as emitting CO₂ or NO_x, keeping pigs or catching fish. Too much CO₂ in the atmosphere is bad for the climate; the precipitation of too much NO_x damages woods and heathland; too much pig, poultry and cattle manure pollutes the soil and water; and overfishing disrupts the marine ecosystem. By stipulating that companies need to obtain permits (or allowances) in order to perform these polluting or environmentally disruptive activities, the government can restrict their scale. By subsequently creating a market for these allowances, the government ensures that the companies responsible for reducing the volume of environmentally damaging activities are those who are able to do so at the lowest possible cost.

This chapter explains how tradable allowances work as a tool of government policy.

2.1 How do tradable allowances work?

A system of tradable allowances works as follows. The government first fixes a ceiling for the total amount of CO₂ or NO_x that manufacturers are allowed to emit, the total number of pigs livestock farmers are permitted to keep, or the total quantity of plaice and sole that fishermen are allowed to catch. The government then divides this total value into portions (i.e. allowances), which it distributes among the operators in question. If any individual operator produces more than it is entitled to produce in accordance with the allowances issued to it, it must then buy extran allowances from companies that produce less CO₂ or NO_x, that do not keep as many animals or catch less fish than they are entitled to under their allowances. As a result, and provided that the rules are obeyed, the total quantity of CO₂ or NO_x emissions, the total quantity of



manure-producing animals or the total fish catch (as the case may be) never exceeds the ceiling and the aggregate environmental damage caused by these activities is limited.

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When used as a policy tool, tradable allowances also have a secondary purpose, which is to foster innovation and environment-friendly investment. The price of emission allowances, for example, should be such as to encourage companies to develop and use more efficient or cleaner production techniques. This type of investment enables the government gradually to lower the ceiling, without causing a corresponding decline in output.

It should be stressed that a tradable allowance is not an ownership right, but a permit or licence that the government is entitled to restrict or rescind. Allowances consist of registered 'deposits' held with executive agencies such as the Dutch Emissions Authority (NEa), rather like deposits held in bank savings accounts. Any form of trading in these deposits must be reported to the NEa. The government and the executive agencies are not themselves party to trading, which is handled by brokers, partnerships and exchanges, or through private deals.

2.2 Why trade in allowances?

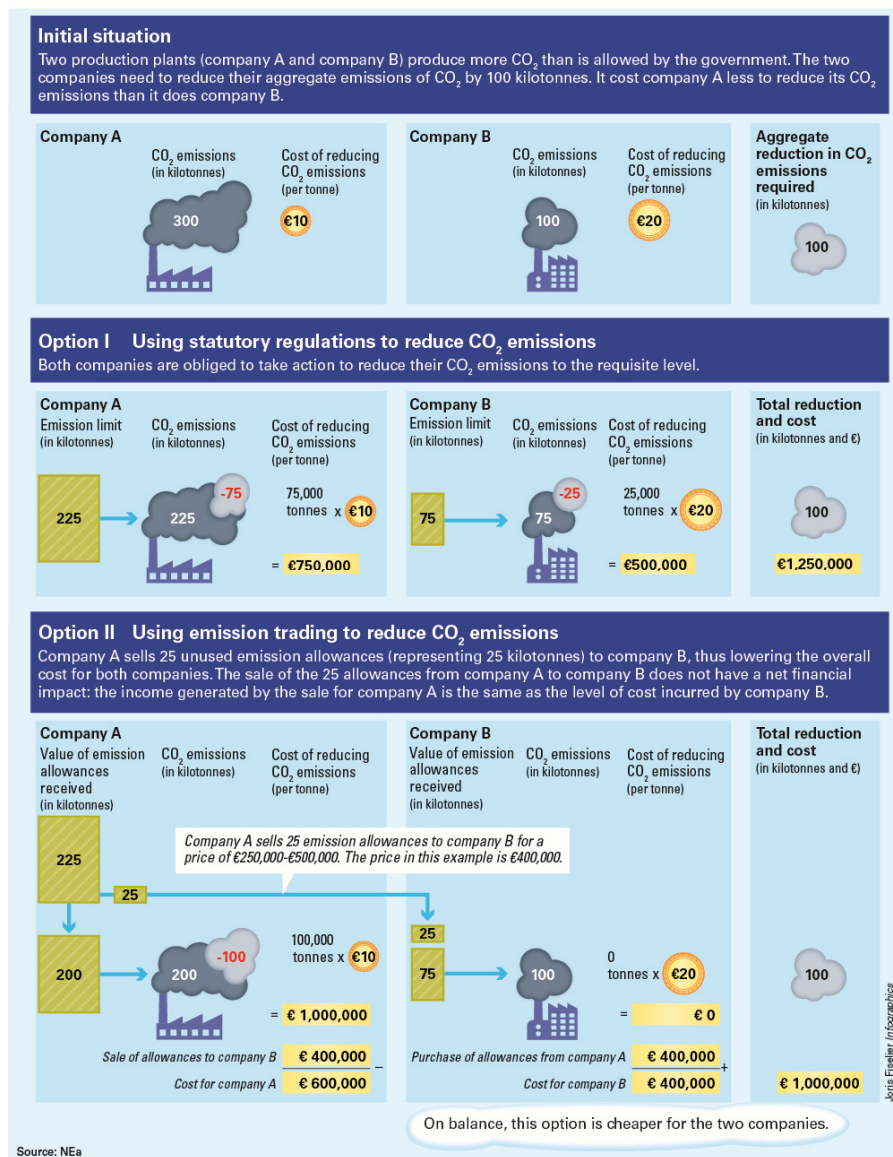
Economists realised in the 1960s that tradable allowances could be used as tools of government policy. They claimed that, despite causing environmental damage to their surroundings, certain companies were nonetheless not required to pay for the resultant cost (i.e. the 'external effects'). If there is no cost, the total amount of pollution or damage, or the total catch, is larger than in a situation in which the companies in question need to account for the cost. Obviously, the solution is to ensure that the companies pay for the cost of the damage they cause. Taxation is an easy way for the government to do this (more on this in the next chapter). Issuing tradable allowances is another option. This means that the government introduces and distributes licences permitting the holder to do something, up to a given limit, that is harmful to the environment. Market operators can then decide for themselves whether to buy or sell these allowances.

The essence of the instrument is that those who know most about the production processes are the producers themselves and that they can use their knowledge to decide what action to take. Moreover, producers who are permitted to produce a specified quantity of pollutant but find themselves getting close to the limit, can choose between using more efficient or cleaner production techniques and buying more allowances.



If it's cheaper to adopt a more efficient or cleaner production technique, the producer in question can then sell its unused allowances to other companies for whom adjusting their production techniques is a relatively costly option. Tradability means that the amount of environmental damage caused is limited by those companies that are capable of doing so at the lowest possible cost (see figure 1). Moreover, the overall ceiling inherent to the system provides a guarantee that this goal is achieved – provided that there is an effective supervisory mechanism.

Figure 1 How do tradable allowances work?





2.3 What factors affect the price of a tradable allowance?

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The number of allowances issued by the government is a major determinant of their price. By definition, scarce allowances are more expensive than allowances that are available in abundance.

Developments in the market on which the company in question sells its products are another important factor. For example, if consumers can buy more high-quality farmed fish in the shops, there will probably be a decline in the demand for marine fish and fishing companies will be less likely to reach the limit of their fishing quota. The price of a fishing allowance will then automatically fall.

A similar trend can affect the price of emission allowances. For example, if there is a fall in the cost of cleaner production techniques, more and more companies producing CO₂ emissions will tend to adopt these techniques and will consequently use up fewer emission allowances. Again, the price of an emission allowance will automatically fall as a result.

The nature and size of the companies involved in the system is another determinant. Large industrial companies making use of the emissions trading system will base their investment decisions on different grounds than relatively small companies. For example, many livestock farms are family businesses that place a different value on labour than other businesses do, so that retirement plans might be a reason for selling their emission allowances.

Finally, the general economic trend can also affect the price of tradable allowances. For example, the current crisis has led to a decline in industrial output, thus enabling the government to meet the national targets for CO₂ emissions without much difficulty. As a result, the high prices that CO₂ emission allowances had been expected to fetch, have simply failed to materialise.

Any change in one of the factors affecting the market in tradable allowances has an immediate impact on the price of the allowances in question. If the market works well, the price of an allowance reflects all the various aspects of supply and demand.

**Overallocation causes price of CO₂ emission allowances to fall**

In the first year of CO₂ emission trading (i.e. 2005), an allowance entitling the holder to emit one tonne of CO₂ cost €30. This price was a reflection of market expectations of the future pattern of supply and demand. When it became clear in the following year that the government had issued too many allowances relative to the actual level of emissions (i.e. there had been an overallocation of allowances), the price collapsed to €10.

2.4 Do tradable allowances have an immediate impact on the Treasury?

The system of tradable allowances is based on the 'polluter pays' principle, i.e. those companies that cause environmental damage are required to pay the cost. Taxation is one way in which the government can do this. If the government decides to adopt a system of tradable allowances distributed by auction, the proceeds would flow to the Treasury, just as with tax revenue. In practice, however, this has not happened to date. All the tradable allowances distributed until now have been distributed free of charge.

Although tradable allowances that are distributed free of charge do not affect the government budget or national accounts, they do have certain financial consequences for the economy. In certain situations, for example, companies will pass on the market value of free allowances to consumers. Companies also use animal allowances and fishing quotas as collateral for bank loans.

The tradable allowances in circulation in the Netherlands at the end of 2012 were valued at over €6 billion. This figure does not include fishing allowances, in relation to which no information on prices is available in the public domain.

It is worth mentioning that the government does in fact incur certain items of expenditure in running a system of tradable allowances. Among the items charged to the budget are the cost of recording allowances and transactions, and the cost of enforcing the regulations that participants are required to observe. For example, the NEa (which is responsible for recording allowances and transactions and for monitoring and enforcing the regulations surrounding trading in CO₂ emission allowances) and the Dutch Food and Consumer Product Safety Authority (the NVWA, which is responsible for enforcing the regulations on animal allowances and the fishing quota) are both funded from the government budget. There is a growing international consensus that these costs should be funded in the



form of a mark-up on the price of the allowances. This principle was also enshrined in the European Commission's original plans for reforming the EU fisheries policy.



3 Other policy options and types of allowance systems

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A system of tradable allowances is not the only means by which the government can seek to reduce the amount of damage caused to the environment. Other policy options available to the government for the same purpose are statutory standards, taxation and subsidies. Other tools, such as self-regulation, covenants and public information campaigns, are also worth considering.

If the government does decide that a trading system is the best option, there are again a number of further options from which to choose. The fact is that trading systems come in many different shapes and sizes. Various lobby groups, such as those representing private-sector companies, will try and influence the government's decision, with a view to securing the best possible result from their own specific perspective.

3.1 How do tradable allowances differ from tax and other policy options?

Tradable allowances form part of a wide spectrum of policy tools that the government has at its disposal for preventing environmental degradation. Among the other tools the government can use for this purpose are *statutory standards*. The government may also decide to levy *tax* on polluting activities, or to grant *subsidies* to companies using clean production techniques. Finally, the government can encourage *self-regulation*, sign *covenants* with companies, and mount *public information campaigns*. Let's take a closer look at the alternatives.

Statutory standards

By imposing statutory standards, the government can set certain technical requirements that companies causing environmental damage are compelled to meet. These may bring with them a relatively high level of cost for the companies concerned, particularly if there are wide differences between them. If the government's aim is to ensure that *every single company* meets the same standards, this instrument is more suitable than a system of tradable allowances, but does raise the cost for the companies affected.



Taxation and tradable allowances

If the government decides to protect the environment by putting a price on environmental damage, taxation or tradable allowances are the most appropriate policy instruments. The effect of both is to contain pollution at the lowest possible cost. This is because, as opposed to a system of statutory standards, companies are free to find the cheapest possible solution. They can adjust their production process so that they need to buy fewer allowances or pay less tax. Or they can decide not to pay for the cost of adjusting their production process and buy more allowances or pay more tax instead. On paper, taxation and a system of tradable allowances both produce the same result. The main difference between the two is that tradable allowances offer a guarantee that the preset ceiling will be reached. In other words, the total quantity of CO₂ emissions, the total number of animals kept by livestock farmers and the total size of the fish catch (as the case may be) are all subject to a maximum limit. However, if there are doubts about the size of the ceiling, taxation is a better option. With a system of tradable allowances, it is difficult to forecast the price at which allowances will trade. A low price offers hardly any incentives for innovation and investment. Taxation does offer this type of guarantee, as it is the government that fixes the price for the pollution.

Subsidies

Another possibility is to subsidise companies for the damage they do not cause. For individual companies, this leads on paper to the same result as taxation or a system of tradable allowances. However, the prospect of a government subsidy is likely to prompt existing operators to step up their production and will also encourage new entrants to join the market, as a result of which greater damage will be caused to the environment in the country as a whole.

Self-regulation, covenants and public information campaigns

Instruments such as self-regulation, covenants and public information campaigns are further ways of limiting environmental pollution. Unlike the instruments described above, they are more or less voluntary and often play a supporting role.

None of the above instruments is suitable at all times and in all situations. In other words, the government needs to consider carefully which instrument is best suited to which type of situation. Whatever instrument is chosen, it is seldom (and in fact never) the case that a particular instrument always fits the bill. If the choice falls on a system



of tradable allowances, the same applies to the mode of operation: this needs to be adapted to individual circumstances.

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Incidentally, the government may also decide not to take any action at all. This is an option where the benefits of a particular policy instrument do not outweigh the costs.

3.2 What alternative versions of tradable allowances are there?

Having now been used as a policy instrument all over the world during the past 40 years, tradable allowances come in many different shapes and sizes. A number of examples follow below.

Location-specific?

A system of tradable allowances can be either location-specific or location-independent. All depends on the type of environmental pollution the system is designed to counter. The greenhouse effect, for example, is a global phenomenon: its impact bears no connection with the location on the planet where CO₂ is emitted. This is why a cross-border system of CO₂ emission trading was designed for the EU; its operation is not dependent on geographical boundaries.

Pollution caused by manure, on the other hand, is location-specific and is best countered by a system of tradable allowances that does take account of geographical differences.

Compartmentalisation of pig allowances

The manure problem in the Netherlands is concentrated in regions with a large number of pig farms, i.e. the provinces of Overijssel, Gelderland, North Brabant and Limburg. For this reason, the country has been divided into separate sub-markets (or compartments) for the purpose of the system of pig allowances. Pig farmers in the above provinces are not permitted to buy allowances from areas outside these provinces. The opposite is permitted, however: allowances may be transferred from these provinces to other areas of the country. When the compartments were abolished in 2008, this instantly led to a rise in the number of pigs kept in the four provinces. The system of compartmentalisation was reintroduced for this reason in 2010.

If the scale of pollution in a particular region is greater than elsewhere, the government may elect to set separate regional ceilings. This is not a course of action that the government has taken in relation to pig allowances.

Time-specific?

The issue of time may also affect the design of a system of tradable allowances. For example, CO₂ remains in the atmosphere for a long time,



and this is something that needs to be borne in mind when setting a ceiling for emissions. Time is also a critical factor in relation to the fishing quota: the ceiling for the various species of fish needs to be set in a way that guarantees their continued survival.

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Which production stage is linked to the trading system?

Another decision to be taken in designing a system of tradable allowances is on the stage of the production process at which trading can best take place. In other words, which particular production stage is linked most closely to the trade in allowances? In the case of CO₂ and NO_x emission allowances, the government decided that the point at which pollution occurs (i.e. the emissions themselves) should form the basis for the system. In the case of animal allowances and milk quotas, the trade is linked to an earlier stage of the production process, i.e. the system is based not on the production of manure or milk, but on the number of animals kept on a livestock farm. In the case of the trade in 'biotickets', the system is also based on the start of the production process, i.e. the point at which the fuel is mixed. This is before the fuel is sold and exhaust fumes are emitted.

The effectiveness of the system depends in part on whether a well-considered decision has been taken on which stage of the production process should be linked to trading. For example, there are wide disparities among pig farmers in terms of the way in which they feed their stock and hence in the quantity of nitrate and phosphate in the manure excreted by the animals. In this knowledge, it would be better to link the animal allowances much more directly with the polluting substances. This is on condition, however, that it is technically feasible to accurately measure the quantity of such substances in pig manure and that it would not be prohibitively expensive to do so.

What is the purpose of the trade in allowances?

Another important consideration to bear in mind when designing a system of tradable allowances, is the aim the government is seeking to achieve. Is the object of the system to reduce pollution (i.e. from NO_x and manure) or to preserve certain rare animal species (such as plaice and sole)? If the former is the case, the allowances must be priced in such a way that they form an incentive for innovation and investment.

Incidentally, tradable allowances can be used in other fields of policy apart from environmental protection. For example, the EU's stated objective in adopting a system of milk allowances was to cut milk production.



Should the ceiling be fixed or relative?

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The assumption thus far has been that tradable allowances are subject to a certain maximum limit or ceiling, i.e. a maximum limit is imposed on the quantity of fish that may be caught within a given period of time, or the number of cows or pigs that farmers are entitled to keep is subject to a certain maximum, or there is a maximum limit on the quantity of CO₂ that may be emitted.

However, it is also possible to define the ceiling in *relative* rather than in *absolute* terms. This means imposing a relative limit on the amount of pollution during a given period. In other words, the amount of pollution is permitted to rise, as long as amount per unit does not exceed a stated limit. The government uses this type of relative ceiling in its quest to control NO_x emissions. Because the maximum quantity of pollution may rise free of charge in line with an increase in output or energy consumption, there is no incentive to cut the level of emissions and very little incentive to innovate or invest. Even though the polluter ought to pay for the cost of dealing with the pollution, the company in fact receives a subsidy. This is due to the fact that companies that succeed in keeping the level of their emissions under the maximum limit are in a position to sell their allowances. A system of tradable allowances based on a relative ceiling is better for competition than a system based on an absolute ceiling.

Constant tightening of ceilings set for NO_x trading system

In order to encourage companies to reduce their emissions and to innovate and invest while nonetheless using a system in which the maximum limits are expressed in relative terms, the maximum emission limits for NO_x are lowered from one year to another. For example, emissions caused by fuel combustion were reduced in annual steps from 68g per gigajoule in 2005 to 37g in 2013.

3.3 What criteria are applied?

None of the variations discussed above fits all situations at all times. In other words, decision-makers need to carefully consider which particular type of system is best suited to the specific context. The choice depends on the government's priorities. As we described in section 3.1, a system of statutory standards is a good choice in a situation in which every single operator is required to meet certain requirements, but may lead to a relatively high level of cost for the companies concerned. Viewed from an efficiency perspective, taxation or a system of tradable allowances has the advantage. Other criteria that may be applied in taking such a decision include effectiveness, the degree of freedom available to the government, whether there is sufficient political support, whether the



companies concerned support the system, the nature and gravity of the environmental damage caused, the operational cost, the practical feasibility of the system, whether it is susceptible to fraud, and so forth.

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Where a trading system is adopted, this is likely to affect not just the industry in question, but the economy as a whole. Competition (both domestic and foreign), public finances, jobs and wealth creation may then become critical criteria. For example, what sort of impact will the adopted system have on the distribution of wealth?

Another vital criterion in relation to tradable allowances is the presence of a market on which the allowances can easily be traded (see chapter 4).

A prior study can help by providing information on the potential consequences that a particular type of system might have for jobs, for example. However, deciding which criteria should be regarded as paramount is a political decision. The problem is that no single system satisfies all the various criteria. Moreover, the available options may also depend on the decision-making process, i.e. decisions taken by the EU on tax-related matters must be unanimous, whereas measures on climate control (such as the adoption of a system of CO₂ emission allowances) are taken in accordance with the customary co-decision procedure.

3.4 How do lobby groups influence the development of allowance systems?

Companies and other interested parties will seek to influence the creation of a system of tradable allowances with a view to obtaining the best possible result from their own particular perspective. As the vast majority of such processes are matters of EU policy, lobbying also takes place at government level. Ministers from EU member states often try to lobby the European Commission so as to design a system of tradable allowances in a way that favours their own domestic companies. Our 2008 report on sustainable fisheries describes how this worked in relation to the establishment of an EU catch limit (Netherlands Court of Audit, 2008a, p. 40).

The trading system in CO₂ emission allowances has also been undermined by lobbying, resulting in national governments allocating too many allowances.



Pressure from lobby groups has had an adverse impact on the CO₂ emissions trading system

In response to pressure from lobbyists, it was agreed that newcomers to the emissions trading system would be issued with allowances free of charge. In practice, this generally results in the expansion of existing capacity and creates inefficiencies.

Pressure from parties affected by the CO₂ emissions trading system has also led to the adoption of a rule under which companies that decide to cease their operations are required to hand in their allowances. Logical though this sounds, the result is that companies have a financial incentive to retain relatively old, inefficient and/or polluting production facilities that entitle them to continue to receive free allowances.

These interventions pose a risk to the effectiveness and efficiency of tradable allowances as a tool of government policy. The government must therefore be aware of their potential effects. The problem is that governments are generally less well-informed than private-sector companies, whose support they need in order to assure the practical success of the instrument they choose to adopt.



4 Exploring the potential market: the crucial first step

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There are a number of ways in which the government can charge companies for the cost of the environmental damage they cause. As we mentioned in chapter 3, a system of tradable allowances is just one of the options, alongside taxation, for example.

Adopting a system of tradable allowances is a wise course of action only if the market created by the government in deciding that the allowances should be tradable, is potentially capable of meeting a number of crucial conditions. For example, both buyers and sellers must possess sufficient information to enable them to effectively perform their roles in the market. This information has to be available free of charge to all parties. Another key condition is that a large number of players should be active on the market. Finally, it is important that trading is not hampered by all sorts of barriers placed in the way of participants and newcomers.

In practice, it is rarely possible to satisfy all these strict conditions. The point is to design a system that does the best possible job. The less well it is adapted to the prevailing circumstances, the less efficient it will be. And if vital components of the system are not capable of operating properly, a system of tradable allowances may not actually be the right tool for the job.

This chapter examines the market conditions.

4.1 Why do buyers and sellers need to be well-informed?

Companies taking part in a system of tradable allowances regularly need to take decisions involving large sums of money. For example, they need to decide on the best time for buying or selling allowances. And they have to take decisions on whether or not to invest in their own businesses. For example, milk allowances are not the only things dairy farmers need to own; they also need dairy cows and cattle sheds.

In a perfect market, all market participants would have access at all times to all the information they need in order to take their decisions. The market would then be completely *transparent*.



In practice, however, there are likely to be wide disparities among market players in terms of the information they have at their disposal. In other words, the market will often be characterised by *information asymmetry*.

Only big companies know about energy-efficient systems

We encountered a good example of information asymmetry in our audit of energy-saving measures (Netherlands Court of Audit 2011, p. 46). When we looked at how companies decided between purchasing (additional) CO₂ emission allowances and investing in more energy-efficient systems, we found that only large companies, i.e. those with a workforce of at least 3,000, believed that they had enough information to maximise the opportunities for reducing their emissions or for meeting the requirements relating to emissions trading in other ways.

It is equally possible that none of market players has enough information at its fingertips. This is the case, for example, if not everyone is clear about the period during which the allowances are valid. It is important to have accurate information on the period of validity in order to take decisions both on the allowances themselves and on investments. As the uncertainty about the duration of the allowances increases, so the propensity to invest will tend to decline and any investments will tend to have a short payback period.

Product marketing boards, producer associations, universities and other research institutes play a key role in disseminating information that is relevant to investment and innovation. The government can also play a supporting role in encouraging the distribution of information.

Reward for sharing information on innovation

In our audit report on the sustainability of intensive dairy-farming, we discussed the government's 1996 incentive scheme for encouraging innovation and boosting competitiveness (Netherlands Court of Audit 2008b, p. 78). Under this scheme, dairy farmers who shared the knowledge they had acquired from a government-subsidised innovation were entitled to a grant worth twice as much (i.e. 50% of the value of the investment) as that received by dairy farmers who kept their knowledge to themselves.

The government can dispel any uncertainty by endowing the system with a certain amount of stability – and hence building a degree of predictability into it. It can do this, for example, by being clear in advance about any changes that might be made to the system and also about its duration. Similarly, the government can make sure that the allowances are managed so that all parties have up-to-date information on the state of supply and demand. This is often not the case at present.



All buyers and sellers want to know how much an allowance costs at any given moment, and whether this is a relatively high or a relatively low price. No real-time price information is available on many tradable allowances.

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Another important point is that the government should publish information on fish catches, CO₂ emissions, manure production and so forth. This type of transparency gives the general public confidence in the authorities and forms an extra incentive for companies to meet the standards set.

4.2 Why do transaction costs need to be kept low?

Collecting the information that is needed to take a well-founded decision on whether or not to buy or sell allowances, or to make certain investments, generally costs money. These expenses are known as '*transaction costs*'. As high transaction costs may discourage companies from taking certain action, and may even lead to market stagnation, they need to be kept as low as possible.

Examples of transaction costs include the costs of negotiation and contract formation, administrative expenditure and registration fees. As far as the latter are concerned, a €250 fee has to be paid to the National Service for the Implementation of Regulations (DR) at the Ministry of Economic Affairs every time an entry in the register of pig allowances is amended. The NEa, on the other hand, does not make any charge for registering emission allowances.

Transaction costs also result from a lack of transparency, i.e. companies that are not well-informed need to take steps in order to gain access to the information they need, for example by engaging a firm of consultant engineers. Clearly, they will be charged a fee for this. Even though large firms can obtain the information they need from their R&D (Research & Development) departments, there is also a degree of cost involved in obtaining this information. We explained in the previous section how the government can help to raise the transparency of the market.



4.3 Why do there have to be lots of market players?

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The more players trade on the market, the more efficient a system of tradable allowances will be. The transaction costs in a market with only a small volume of trading will generally be high because buyers and sellers will need to actively find counterparties with whom they can trade. That means that the market does not work well; the trading system will not be able to attain the degree of efficiency it is intended to achieve. Moreover, if there are only a few market players, there is also a risk of a company or a group of companies forcing the price up in order to generate extra profits, make life difficult for competitors and prevent newcomers from gaining access to the market.

In practice, however, it is simply the case that there are certain markets in which there are only a small number of participants. In some cases, there may be no more than a couple of market players. In such situations, the imposition of statutory standards or a form of taxation may be a better option for the government than adopting a system of tradable allowances. This could also apply to certain sub-markets in fishing quotas.

Market in NO_x emission allowances smaller than the market in CO₂ emissions allowances

Of the companies known to emit NO_x, around 350 are members of the NO_x emission allowances trading scheme. However, the fact that the market is limited to the Netherlands means that it is relatively small. The number of Dutch companies taking part in the CO₂ emission allowances trading system is more or less the same. However, the big difference with the NO_x trading system is that the market in CO₂ emission allowances is not restricted to the Netherlands: it embraces some 11,000 companies from all over the EU. Indeed, trading in these allowances is open to anyone in the world.

4.4 How can trade barriers be prevented?

The government must prevent trade barriers from being formed. These may be barriers preventing newcomers from joining the market or existing market players from leaving the market, as well as barriers to trade itself. Many ostensibly tradable allowances are not in fact freely tradable in practice: not everyone is free to buy or sell them. Market participants need to satisfy certain requirements, such as owning cattle sheds or a fishing boat. Of the allowances we examined, only CO₂ emission allowances proved to be genuinely freely tradable, even by organisations such as *Stichting Natuur en Milieu* ('Foundation for Nature



Conservation and Environmental Protection'), which has called on the general public to buy and destroy CO₂ emission allowances.

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Where the government decides to distribute the allowances free of charge, this results in the formation of a major barrier to those wishing to join the market. As we demonstrated in our 2008 audit of sustainable fisheries, the level of cost is much higher for newcomers than for existing market participants, as the former are obliged to buy their allowances on the market (Netherlands Court of Audit 2008a, p. 22). An exit barrier may be formed where participants who have acquired their allowances free of charge, are required to hand in their allowances when they leave the market. This makes it more attractive for companies to retain their relatively old, inefficient and/or polluting production capacity.

A market operates well if it allows any given quantity of allowances to be bought or sold at any time, as this means that it can satisfy all the demands of buyers and sellers. This type of flexibility is inherent to the market in fishing quotas, for example, as these can be traded both in their entirety and as fractions. As an added advantage, fishing quotas can also be rented out in addition to being sold (as also applies to animals allowances and milk quotas, incidentally). In the case of animal allowances, the flexibility of the market is undermined by the fee (€250) that companies are required to pay every time an amendment is made to the register. This is a type of implicit trade barrier imposed by the government. Due to these transaction costs, a company buying 38 pig allowances at a price of €65, for example, is required to pay a 10% surcharge on top of the price of the allowances.

The flexibilities and restrictions discussed above are inherent to the nature of the various allowance systems. This means that the government can take account of these potential advantages and disadvantages during the design stage, so as to maximise the tradability of the allowances.

In order to ascertain whether a potential system of tradable allowances is likely to satisfy the four market conditions described in this section, it is worth analysing the composition of the potential market before launching the scheme. This can be done by consulting organisations that are familiar with the product market, such as the Netherlands Competition Authority (NMa), the Netherlands Environmental Assessment Agency (PBL) or LEI Wageningen UR (a leading social-economic research institute).



5 Interaction with other policy tools

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A problem analysis should be performed before any decision is taken to adopt a system of tradable allowances as a tool of government policy. Both a policy objective and a policy theory should also be formulated before the decision is taken.

A policy theory describes how a given *tool* (tradable allowances in this case) leads to a given *objective* (for example, a maximum permissible level of emissions or a fishing quota) and hence produces a certain *social impact* (for example, limiting atmospheric pollution or sustaining fish stocks).

In practice, however, tradable allowances often form part of a broader set of tools that are together intended to produce the desired result. The aim of performing a problem analysis and formulating a policy theory is to build up a picture of the complex set of relevant problems, causes, tools and objectives, including the interrelationship between them. In this connection, account needs to be taken of the interaction between the various policy tools. This chapter examines a number of specific interactions that may affect a system of tradable allowances.

5.1 Can a policy tool serve more than one purpose?

Most policy tools serve just one policy objective. Similarly, most policy objectives are served by just one policy tool. Where a number of tools are designed to achieve the same aim, this may undermine the efficiency of government policy in the field in question and in some cases also its effectiveness. This problem is illustrated by the way in which the Dutch government has chosen to implement two EU directives for curbing NO_x emissions (see box).



Inefficient combination of measures aimed at reducing NO_x emissions

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In issuing NO_x emission allowances, the Dutch government is implementing an EU directive on a national emission ceiling (NEC) the aim of which is to combat soil and water acidification, which damages ecosystems. The Dutch government has decided to enforce the emission ceiling imposed in the directive by adopting a system of tradable allowances. This means that manufacturers are free to choose either to adjust their production plants (and sell any superfluous emission allowances they may hold as a result) or to leave their production plants as they are and buy additional emission allowances.

The latter option is contrary to European law, however. This is because one of the ways in which the EU has sought to combat air pollution is by issuing a directive on industrial emissions under which industrial installations must meet certain specific requirements. In other words, the effective operation of the system of tradable allowances is thwarted by the fact that more than one policy tool has been deployed in order to achieve the same aim.

Not only should a confluence of measures be avoided as far as possible. The government should also ensure that measures are not accumulated in order to achieve a given objective.

At the same time, there is no reason why a combination of measures should *invariably* be inefficient and/or ineffective. In certain circumstances, a measure may have a positive side effect, i.e. by helping to achieve another goal of government policy. This is what happened with the milk quota (see box).

Reducing the 'milk lake' also helps to curb manure production

The EU introduced the system of milk quotas in 1984 and subsequently decided in 1987 to try and reduce the growing 'milk lakes' and 'butter mountains' in Europe by making the quotas tradable. Because a milk quota automatically imposes a limit on the number of cows kept by dairy farmers, it also helps indirectly to curb manure production. This is why the milk quota system in the Netherlands is now regarded – just like the systems of pig and poultry allowances – as a tool of the government's manure policy.

5.2 Can trading in allowances have an undesirable effect?

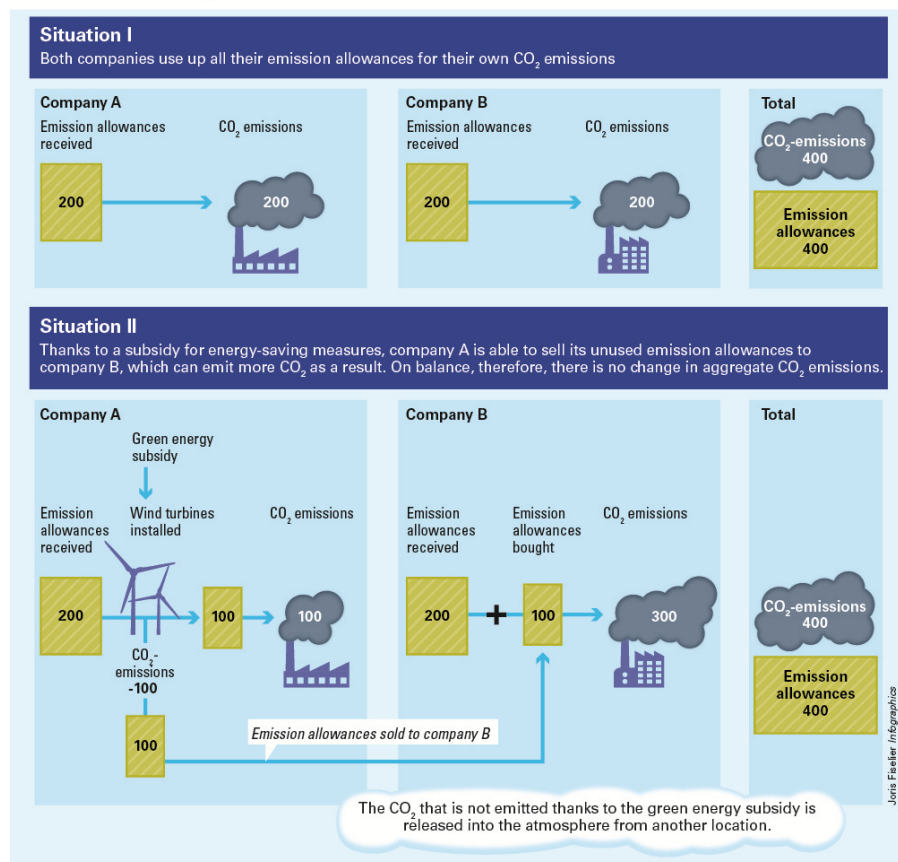
In practice, a system of tradable allowances may unintentionally lessen the effectiveness of other environmental protection measures. This is another reason why, in planning the implementation of its policies, the government should make a careful study of the interaction between the variety of tools deployed in relation to a specific policy field.

The situation relating to the government's climate policy is a good illustration of the impact that tradable allowances can have on other tools and *vice versa*. Under the 1997 Kyoto Protocol, the Netherlands agreed to reduce its CO₂ emissions. The European CO₂ emissions trading system plays a vital role in the Dutch government's mission of achieving



these reduction targets. At the same time, there is a degree of interaction with the national energy policy, and this is not consistently favourable. The government awards grants to companies to encourage them to reduce their energy consumption and adopt cleaner production techniques. These grants are also awarded to participants in the CO₂ emissions trading system. If a company makes use of an investment incentive scheme (such as the Energy Investment Allowance) and consumes less energy as a result, this will often lead to a number of CO₂ emission allowances becoming superfluous. The company may then decide to sell these unused allowances to another company, either in the Netherlands or (more commonly) in another EU member state (see figure 2). As a result, the CO₂ emission that the Dutch government grant helped to eliminate, still reaches the atmosphere as a result of being released in another EU country at another time. If this happens on a wide scale, it will actually reduce the cost of pollution. In these circumstances, allowances obtained free of charge act as subsidies on the 'transfer' of polluting activities.

Figure 2 Adverse effects of the interplay between energy-saving measures and the CO₂ emissions trading system
In kilotonnes of CO₂





There is a similar type of negative interplay between the CO₂ emissions trading system and government grants for encouraging companies to invest in the generation of energy from sustainable sources, for example by building wind turbines. The problem is that, although such investments reduce CO₂ emissions in one particular location, the fact that the overall emission ceiling remains the same means that the CO₂ still gets into the atmosphere by being emitted elsewhere in the EU. In short, the savings achieved by the policy on green energy result in CO₂ emissions in other locations, due to the sale of CO₂ emission allowances.

In other words, measures to promote the use of energy from sustainable sources do not affect the reduction in CO₂ emissions achieved by the trading system. Conversely, the CO₂ emissions trading system has a very limited impact on energy-saving. In our 2011 audit of energy-saving measures, we reported that the impact of the CO₂ emissions trading system on energy-saving was fairly marginal. In fact, we described its efficiency in this sense as 'poor' (Netherlands Court of Audit 2011, p. 70).

5.3 Can other policies hamper the operation of allowance systems?

Apart from taking measures (such as the adoption of a system of tradable allowances) to reduce environmental damage, the government may also take measures that are actually damaging to the environment. Tax allowances are a good example, as these often undermine the efficiency and effectiveness of tradable allowances.

Big tax breaks for industries emitting CO₂ and NO_x

The energy industry receives an estimated €2 billion worth of government grants every year and is responsible for some 33% of all CO₂ emissions. The transport industry receives around €7.6 billion in government grants every year and accounts for approximately 20% of CO₂ emissions and about 60% of all NO_x emissions. These tax breaks are completely at odds with the environmental objectives the government is seeking to achieve with the aid of the system of tradable allowances.

In order to counteract this detrimental form of interplay, the Netherlands has signed up to various international and European agreements that are intended to curtail the main tax breaks that adversely impact the environment. The phasing out of environmentally unfriendly forms of tax relief will not necessarily lead to a corresponding decline in the level of pollution, however. Indeed, scrapping certain tax allowances may actually lead to a rise in the level of pollution: 'pollution leakage' may



arise, for example, where the production of certain goods is moved to countries where there are no restrictions on polluting activities. When scrapping such schemes, it is also important to examine the potential impact on their economic objectives. In other words, do the environmental gains outweigh the economic losses?

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The potential interplay with environmentally damaging subsidy schemes is one of the factors that should be taken into account when planning a system of tradable allowances.

5.4 Can tradable allowances encourage innovation?

When the government decides to set up a market in pollution allowances, it has a secondary aim, i.e. to encourage innovation and investment. After all, the system encourages companies to use it as a means of curbing pollution. More specifically, the price companies pay for a pollution allowance (which they can then sell-on to others once they have innovated and invested) should act as an incentive to reduce pollution. In practice, however, the price does not form a sufficient incentive, partly because there is a glut of allowances on the market (a result of overallocation). Whether a higher price would indeed help to foster innovation is something that remains to be seen. Even if the price were higher, it would still be at least difficult and perhaps impossible for innovative companies to fully recoup the high cost they had incurred. In many cases, other companies copy the new technology without having contributed to the development costs.

In short, effectively stimulating innovation requires a specific set of supplementary policy tools. The problem (as we have already seen) is that such supplementary tools can hamper the operation of the system of tradable allowances.

Generally speaking, the problems described above still need to be resolved. Combining a system of tradable allowances with taxation, for example, might be one way of doing so. Another option would be to try and find more efficient alternatives. Instead of searching for expensive new techniques for 'greening' the marine fishing industry, the government could try and come up with lasting solutions, such as a sustainable (i.e. fish-friendly) form of fish farming.



6 The choice between free distribution and an auction system

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Once the government has decided to adopt a system of tradable allowances, there are various ways of organising the initial distribution of allowances. The government may decide to distribute the allowances free of charge (a system known as 'grandfathering'), to auction them, to raffle them off or simply to hand them out on the basis of 'first come, first served'. These techniques can also be used in combination with each other.

In practice, however, free distribution is the most popular method in both the Netherlands and other countries. This is despite increasingly vocal calls for auctions, which are now growing increasingly popular. Indeed, some of the allowances that are coming up for distribution during the third trading period of the CO₂ emissions trading system are due to be auctioned off.

This chapter focuses on the choice between the free distribution of allowances and an auction system. What are the pros and cons of both methods?

6.1 Why is free distribution the most popular system?

All the tradable allowances currently used by the Dutch government for environmental policy purposes were initially distributed free of charge. One of the main reasons for doing so was to create broad support for a trading system, not just among politicians but also among private-sector companies. Indeed, the absence of broad support has proved one of the biggest obstacles to the attempts made by governments all over the world to auction off tradable allowances.

The free distribution of tradable allowances is perceived by private-sector companies as a form of compensation for the investments they have to make in order to prevent environmental damage.



Another reason why free distribution is popular has to do with competition between those companies that pay a price (in the form of the market value of the allowances) for the environmental damage they cause and those companies that do not need to do so due to the fact that they are not based in the Netherlands or the EU (i.e. the territory of the CO₂ emissions trading system). The free distribution of the allowances means that companies covered by the system are compensated for the competitive disadvantage such a system brings with it. This has the effect of lessening the risk of their moving to a country where they can produce more cheaply (because the government there has not adopted any environmental protection measures) and hence of the pollution 'leaking' to a foreign country. This applies in any event to environmental damage that is not restricted to a specific location, such as that caused by CO₂ emissions.

A company's decision to move its production facilities to another country clearly affects the level of employment in its original location. This is often a key factor in the political debate.

Whether companies are actually prepared to move to non-EU countries in order to avoid the cost associated with tradable allowances is a matter of debate. The findings of various studies that have been conducted around the world have been mixed.

6.2 What are the risks associated with the free distribution of allowances?

Obviously, if allowances are distributed free of charge, this does not mean that every participant receives the same number of allowances. Various distribution formulae may be employed. Allowances may be allocated on the basis of previously measured emission levels (in the case of CO₂), output levels (in the case of milk), the number of animals kept (in the case of pigs or poultry) or energy consumption. The government needs to ensure that companies are not able to influence the data that form the basis for the allocation of allowances. If they are, this will undermine the efficiency or effectiveness of the system.

'Historic' data distorted in order to obtain more allowances

The original distribution of pig and poultry allowances (in 1988) was based on historic data, i.e. manure production allowances issued in 1987. Although the latter were no longer open to manipulation by farmers at the time when the pig and poultry allowances were distributed, the political debate in the run-up to the launch of the system had alerted farmers to its imminent arrival. As a result, they acquired larger numbers of livestock than their farms could actually handle.



It has proved difficult in practice to come up with a fair distribution formula. Distribution is sometimes complex, which can result in high transaction costs.

Another drawback of free distribution lies in the fact that companies are able to earn a profit by adding the market price of the allowances they have obtained free of charge to their own product prices. These windfall profits go to the owners of the companies in question, generally the shareholders, who are able to boost their earnings without incurring any costs.

6.3 Why do companies charge for allowances they have obtained free?

In practice, certain companies add the value (i.e. the market price) of allowances they have obtained free of charge to their product prices. This means that consumers end up paying for costs that the companies have not actually incurred, resulting in windfall profits.

This practice is based on the following rationale: in accordance with sound business principles, a company costs its products not merely by taking account of the costs it has actually incurred, but also by factoring in certain 'costs' that result from deliberately missed opportunities. In this particular case, the company could have sold-on the allowances it had obtained free of charge. Not doing so means forfeiting revenue it would otherwise have received. This is known as an 'opportunity cost'.

Windfall profits are socially undesirable. After all, the very idea of a system of tradable allowances is that the cost of environmental damage should be paid by the companies causing the damage. Now, however, they actually profit from the damage: by pricing in the value of allowances they have received free of charge, they receive extra revenue without having to incur any corresponding costs.

Incidentally, whether a company is actually able to add the value of freely obtained allowances to its product prices depends on a variety of factors. One of them is its position relative to foreign competitors. Another is the degree to which demand for its products (steel, for example) is responsive to changes in the price, i.e. how price-elastic demand is. The lower the price-elasticity, the more opportunity a steel producer has for adding the value of the emission allowances to its product prices.

**Factoring in the market value of freely obtained CO₂ allowances**

On average, companies factored 50-60% of the market value of their CO₂ allowances into their product prices. There were wide differences between individual sectors, however. Oil refineries, iron and steel manufacturers and petrochemical producers in particular were able to add a large proportion of the market value to their prices, in some cases even up to about 100%. In a study commissioned in 2011, we found that, where freely obtained CO₂ allowances traded at a price of €20, this generated an estimated mark-up of €800 million per annum (Netherlands Court of Audit 2011, p. 68).

6.4 Which is better: free distribution or auction?

Where allowances are distributed by auction, they end up in the hands of those parties who are prepared to pay most for them. In other words, this is an efficient method of distribution. The same level of efficiency is also achieved by the presence of a market in allowances distributed free of charge, although the difference is that it may take years for this effect to be achieved. A big advantage of an auction system is also that it eliminates the problems inherent to free distribution (see above). An auction system does not benefit shareholders at the expense of other parties, and makes it easier for consumers to understand the need for passing on the cost in product prices.

In other words, there is more likely to be broad public support for the system. Having said that, the need to mobilise support among politicians and producers alike has led to free distribution being by far the most popular choice.

Economists have been looking for ways and means of combining the advantages of both systems. They have come up with systems in which freely allocated allowances are linked to forms of taxation or to an auction. In the latter case, companies obtain some of the allowances allocated to them free of charge and are required to obtain the remainder from an auction. The proportion of free to auctioned allowances can be varied in accordance with the level of cost already incurred by companies (and still to be incurred in future) in reducing their polluting emissions. The European Commission has decided to use this hybrid method of allocation in distributing the allowances for the third period of the EU Emissions Trading System (ETS). This means distributing some of the allowances free of charge and auctioning off the rest. The percentage of allowances distributed free of charge is based on the anticipated degree of emission 'leakage' to foreign countries.



Economists have also tried to find other means of addressing the risk of pollution or emission 'leakage' caused by the auctioning of emission allowances. One option would be to tax energy-intensive imports and to subsidise energy-intensive exports. There are certain practical objections to this, though. Another suggestion that has been made is to award production grants to industries where there is the highest risk of production being displaced to other countries.

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In the end, the possibility of generating government revenue is a key argument in favour of auctioning tradable allowances. Exactly how the government uses the income raised by an auction is a vital consideration, however. In the worst case, distributing the allowances free of charge may actually prove more efficient than auctioning them.

6.5 What could the proceeds of auctions be spent on?

Various suggestions have been made as to how to spend the money raised by auctions. Here are a few of them:

- The government could make a carefully targeted use of the proceeds of allowances auctions by *lowering income tax, energy tax or corporation tax rates* for the participants in a system of tradable allowances.
- The revenue could also be used as a means of *funding the import and production grants* described above (to prevent 'pollution leakages').
- Another possibility would be to use the money to *lower the central government financial deficit*. Since the environmental damage caused by emissions affects future generations, a lower deficit would offset the future cost.
- Given that the *lowest-income households* spend a relatively large proportion of their income on energy and energy-intensive products, the proceeds could also be used to redress the balance.

Apart from the problem of gaining political support for the above measures, they are not equally practicable. It would be hard to define a specific category of corporation taxpayer, for example, and there would also be a risk that a lower level of corporation tax could be seen as a form of state aid.

The European Commission has stated its intention of using at least 50% of the proceeds of auctions for climate policy purposes. Although the budgetary system in the Netherlands does not allow for revenue raised from an auction of emission allowances to be earmarked for a specific



spending purpose, the government has promised to report to the European Commission on whether Dutch expenditure on climate policy is in line with EU criteria.



7 The government's role during the implementation stage

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Like a new building, a new market needs to 'set'. Buyers and sellers need both to gain experience in using the asset in practice and also to familiarise themselves with the workings of the market. This takes time – which was why the first trading period of the CO₂ emission allowances system (i.e. 2005-2007) was intended as a trial period.

The government's main responsibility during this stage is to ensure that both emission allowances as a tool of government policy and the market in them are able to flourish. The government must also ensure that the rules associated with the system of tradable allowances are obeyed.

This chapter looks at a number of do's and don'ts for the government during the initial stages of a system of tradable allowances.

7.1 What is the main pitfall at the start of an allowance system?

It is absolutely crucial for the government's behaviour during the start-up stage, when a system of tradable allowances needs to start 'working', to be stable and predictable. The developments surrounding the market in pig allowances perhaps form the best illustration of what this means. From the outset, the government intervened in the market by regularly announcing new measures (see box).



Constant government interventions leave pig farmers confused

During the first few years of its operation, the market in pig allowances suffered from an unstable policy environment. For a start, no ceiling was set for aggregate manure production, which meant that the whole operation had no clear objective. Secondly, there was confusion during the first few years (i.e. 1998-2002) about the rules for the sale of pig allowances. As a result, a larger number of allowances remained in circulation than had initially been intended, prompting the then Minister of Agriculture, Nature and Food Quality to intervene. Between 1999 and 2001, the government repurchased, for a sum of €400 million, a number of the allowances that it had previously distributed free of charge. At the same time, farmers were granted exemptions during the period from 2000 to 2010 that enabled them to keep pigs without having to obtain pig allowances.

There were further policy changes as time went on. The market was initially divided into a number of separate regional sub-markets, but these were scrapped in 2008 before being reinstated in 2010. The allowances themselves were also amended on a number of occasions, for example when the allowances for baconers, porkers and heavy pigs were combined with those for sows. The government also tried to breathe new life into the market by taking various other measures, such as when a scheme for the sale of manure was adopted in 2001. The idea was for this to replace the allowance system in 2005. In the end, however, the manure scheme was itself dropped in 2005 on the grounds that it was too complex and too expensive.

The instability of the pig allowances market illustrates the dilemma facing the government when an allowance system is put into effect: should it keep a distance or intervene? The case of the pig allowances demonstrates the importance of pursuing a consistent, stable policy at all times. Good policy planning is crucial in this respect. However good the planning may be, though, situations may nonetheless arise in which intervention becomes unavoidable.

7.2 What can the government do if the system does not work as it should?

The way in which a system of tradable allowances operates in practice can easily differ from what the planners had in mind when they designed the system. In such an event, and despite the importance of maintaining stability, there may be an urgent need for government intervention (as in the case of the market in pig allowances).

Situations necessitating government intervention can arise in all sorts of different ways. First of all, there may be design errors in the system. Some of these errors may be predictable, others may not. It is simply not possible to forecast right down to the last detail how everything is going to work in practice. Moreover, markets are not always perfect in practice. It remains a good idea to assess the operation of allowance systems in advance, by performing prior studies. The system may need



to be adjusted in the wake of new environmental targets and EU policy initiatives, for example. In addition, the behaviour of other players may have an adverse effect on the system's efficiency or effectiveness. This is the case, for example, with the CO₂ emissions trading system, in relation to which the member states had been given an exclusive right to take any major decisions (such as adopting a distribution formula). This right was restricted in the wake of a series of centralised decisions taken during the third trading period.

Finally, certain developments may undermine the operation of a system of tradable allowances. For example, the current economic crisis has not only resulted in certain environmental targets being met without much of an effort, it has also removed many of the price incentives for innovation and investment. This prompted the European Commission to announce a number of plans in 2012 for adjusting the CO₂ emissions trading system, with the aim of raising the price of an emission allowance.

The European Commission's plans for adjusting the CO₂ emissions trading system

The European Commission has proposed auctioning off fewer CO₂ emission allowances than originally envisaged, and not allowing trading in these allowances until 2016. The Commission has also made six suggestions for a structural reform of the allowance system. For example, it has proposed:

- permanently fencing off a given proportion of the allowances from the auction system;
- raising the emission reduction target for 2020 from 20% to 30%;
- extending the system to other sectors, such as traffic and transport;
- introducing a price-adjustment mechanism such as a minimum price.

The Commission's aim in making these changes is to create greater scarcity, and hence push up the prices of the emission allowances.

It is clear from the debate on the CO₂ emissions trading system that the system is still in the course of development. Nor is it very surprising that this system should be the topic of such intense debate: the fact is that, due to the international context, it is the most ambitious system devised in the world to date.

7.3 How can government intervention be avoided?

The shortcomings described above show how important it is, when designing a system of tradable allowances, to build into it certain features that allow the government to make any necessary adjustments, without having to make unexpected interventions that distort the market.

Some economists have suggested taking emergency safety measures, for example to deal with a situation in which planners miscalculate the maximum limit. This is something that hybrid policy tools are capable of



dealing with. We have already discussed the idea of using a system of tradable allowances in conjunction with taxation. If the maximum limit proves far too low than forecast, a combined system can act as an adjustment mechanism, either guaranteeing a minimum price or preventing the price from skyrocketing.

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There are also other ways of building flexibility into the system. For example, a variable ceiling may be set, or participants invited to exchange or trade their allowances with companies participating in other programmes or systems.

The adoption of banking and borrowing mechanisms can also make an allowance system more flexible. With a banking mechanism, unused allowances can be set aside for later on. Borrowing works in the opposite way, i.e. where a company is not planning to use allowances allocated to it for future use, it may nonetheless decide to trade in them.

Programmes in operation in other parts of the world, as well as studies of systems of tradable allowances, have shown that a banking mechanism can be used to create a 'buffer' that lessens uncertainty and prevents excessive price fluctuations.

The suggestions outlined above have both their supporters and their critics, and have not yet become standard features of systems of tradable allowances where these are used as tools of government policy. Moreover, their use is context-specific, i.e. the precise nature of a system of tradable allowances always reflects the particular circumstances in question. Accurate, up-to-date prior analyses are absolutely vital, therefore.

Whatever the case, the government needs to be transparent in explaining, before any such system is adopted, what sort of steps have been taken to enhance its flexibility.

7.4 How can the government ensure that participants obey the rules?

Even when the very first systems of tradable allowances in the world were introduced, it was clear that effective supervision and the strict enforcement of rules and regulation were going to be preconditions for their success.

In certain cases, the risk of rules being broken is more or less inherent to the tradable allowances themselves. This means that additional action needs to be taken in order to raise the level of compliance. One of the government's duties in implementing a system of tradable allowances is



to make sure that an effective supervisory mechanism (including enforcement and sanctions) has been put in place.

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Clearly, a well thought-out system of sanctions is crucial. Sanctions must form a sufficient deterrent and also be proportionate to the risk that wrongdoers run in breaking the rules. After all, without an effective enforcement mechanism, fraudulent participants stand to gain an extra advantage over other market parties. At the same time, the programme may fail to meet the environmental goals set for it if the emission ceiling or quota is exceeded.

A risk of fraud arises if the allowances represent a high value, due either to their price or to the number in circulation. This risk affects not just fishing quotas and pig allowances, but also CO₂ emission allowances. Their free tradability makes CO₂ emission particularly sensitive to criminal activity. This is why there is such a strong need for the integrity of the market to be subjected to close scrutiny.

Fraud with CO₂ allowances

There are a number of reasons why the CO₂ emissions trading system is susceptible to fraud:

- the amount of money involved (i.e. billions of euros);
- the fact that transactions are conducted at speed, all over the world;
- the easy accessibility of the system, which is open to anyone wishing to trade.

In 2009, the authorities identified a number of cases of fraud involving the trade in CO₂ emission allowances. Representing several hundreds of millions of euros, these included VAT fraud, identity theft, alleged money-laundering and 'phishing', the aim of which is to gain illegal access to someone else's accounts. The NEa claimed that sufficient steps have now been taken to deal with most forms of fraud.



Terms and abbreviations

List of terms

Animal allowances	Allowances awarded to livestock farmers by the EU that have the effect of limiting the number of manure-producing animals they are allowed to keep.
Banking	Retaining certain unused allowances for use in a later trading period.
Biotickets	Tradable deposits allocated by the government in order to compensate a company for the costs incurred in selling biofuels.
Borrowing	Making use of certain allowances allocated for a later trading period.
Carbon leakage	See below, under 'leakage'.
Ceiling	Maximum limit imposed by the government, for example on the total amount of pollution caused, or the aggregate fish catch.
Compartments	Separate sub-markets in pig allowances.
CO₂	Carbon dioxide, a gas large quantities of which are emitted by manufacturing companies and which is one of the causes of the greenhouse effect (i.e. global warming).
CO₂ emission allowances	Allowances awarded to manufacturing companies by the EU that have the effect of limiting the amount of greenhouse gas they are allowed to emit.
Emissions Trading System (ETS)	The EU's trading scheme in CO ₂ emission allowances.
Energy Investment Allowance	A tax relief scheme designed to encourage investments in energy-efficient technology and sustainable energy sources.
External effect (or 'externality')	Unpriced environmental damage or other forms of pollution caused by economic activities.
Fishing quota (also known as 'fishing allowances' or Individual Trading Quota)	Allowances awarded to fishermen by the EU that have the effect of limiting the size of marine fish catches.
Fishing allowances	See 'fishing quota'.
Grandfathering	Free distribution of tradable allowances.
Information asymmetry	A situation in which the parties in a given market do not all possess the same information.



Milk quota	Allowances awarded to dairy farmers by the EU that have the effect of limiting the quantity of milk they are allowed to produce. The Dutch government regards milk quotas as being equivalent to animal allowances for dairy cattle.
NO_x	Collective name for nitrogen oxides, i.e. NO and NO _x , which are the products of high-temperature combustion, e.g. in a combustion engine. NO _x emissions lead to plant acidification and are one of the causes of the greenhouse effect (i.e. global warming).
NO_x emission allowances	Allowances awarded to manufacturing companies by the EU that have the effect of limiting the amount of nitrogen oxides they are allowed to emit.
Opportunity cost	The cost arising from a deliberately missed opportunity, and the income that is forfeited as a result.
Phishing	A form of internet fraud in which victims are lured to a fake website where criminals can gain access to their log-in codes.
Pig allowance	A type of animal allowance.
Policy theory	A line of argument describing how a policy tool produces the desired effect and hence has the desired social impact.
Pollution leakage	Transfer of pollution or CO ₂ emissions to a country that has not taken any action to restrict pollution or CO ₂ emissions, with the effect that the pollutant or CO ₂ (as the case may be) continues to be emitted.
Poultry allowance	A type of animal allowance.
Price-elasticity	The degree to which the price of a product is responsive to changes in demand.
Total Allowable Catch (TAC)	The ceiling for fish quotas.
Transaction costs	The costs associated with the sale or purchase of allowances.
Windfall profit	Profit earned by a company that adds the market value of allowances it has obtained free of charge to the prices it charges its customers.

List of abbreviations

DR	National Service for the Implementation of Regulations
ETS	Emissions Trading System
EU	European Union
NEa	Dutch Emissions Authority
NEC	National Emission Ceiling
NMa	Netherlands Competition Authority
NVWA	Dutch Food and Consumer Product Safety Authority
PBL	Netherlands Environmental Assessment Agency
TAC	Total Allowable Catch



Bibliography¹

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Netherlands Court of Audit (2008a). *Duurzame visserij* ('Sustainable fisheries'). House of Representatives, 2008–2009 session, 31 748, nos. 1–2. The Hague: Sdu.

Netherlands Court of Audit (2008b). *Duurzaamheid intensieve veehouderij* ('Sustainable intensive livestock farming'). House of Representatives, 2007–2008 session, 31 478, nos. 1–2. The Hague: Sdu.

Netherlands Court of Audit (2011). *Energiebesparing: ambities en resultaten* ('Energy Saving: ambitions and results'). House of Representatives, 2010–2011 session, 33 016, no. 1. The Hague: Sdu.

¹ This list only contains works explicitly referred to in this document. Please see our website (www.courtofaudit.nl) for a full list of the sources we consulted in performing this audit.

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