**INTOSAI WGEA research project on market based instruments for environmental protection and management**

**DRAFT REPORT**

*Alternative title: Economic instruments in environmental management*

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| *Dear INTOSAI WGEA Steering Committee members,*  *We are glad to present you our project team efforts in compiling the research project report on market based environmental policy instruments. We are glad to receive any comments and recommendations (e. g on structure, content, references, readability) to improve our project report! Your experience in auditing MBIs and possible risks and opportunities related to that are very welcome.*  *We would be grateful to receive your comments in written form before the INTOSAI WGEA SC meeting in Kairo in 27 Sept – 1 Oct.*  *Please forward your comments on research project draft to NAO of Estonia via the INTOSAI WGEA Secretariat or directly to* [*viire.viss@riigikontroll.ee*](mailto:viire.viss@riigikontroll.ee)  *Have a nice reading!* |

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# Introduction

## Purpose of the paper

Governments need to choose policy instruments to implement their environmental policy and to achieve environmental goals. For that purpose they may use traditional “command and control” approaches, but also may choose to use market based instruments as a more efficient or more acceptable approach to meeting their objectives. In practise it is not about making a choice between regulatory and market based instruments, but rather finding a good mix between these two approaches.

This paper gives a brief overview of market based environmental policy instruments (MBIs) – what they are, why governments use them, and how they can help to achieve environmental objectives. The paper also discusses SAIs’ potential role in auditing MBIs and presents the experience of SAIs to date, providing an overview of opportunities and common risks and obstacles that auditors might need to consider in auditing MBIs.

This paper is not an exhaustive treatment of the subject. It is rather meant to serve as a useful source of information for SAIs who are unfamiliar with the concept of market based instruments and their use in environmental protection and management. It is intended to provide useful information both for SAIs with less experience and for SAIs with more experience who want to extend their work auditing MBIs.

## Scope and structure

The term “market based environmental policy instruments” (MBIs) is used to describe a very wide range of policy instruments. Their common characteristic is the use of market power and competition to achieve environmental objectives (often described as an alternative to regulatory instruments). The paper’s focus will be on the more common economic instruments such as environmental taxes/charges, deposit refund systems and tradable permits (e. g emissions trading schemes, quotas, allowances).

Chapter 2 will shortly discuss the need of governments to make environmental policy and what are the main reasons behind it (e. g externalities). It indicates the position of MBIs in the whole set of different policy instruments, and how governments can act in markets.

Chapter 3 gives closer insights into MBIs, why and in which situation these instruments can be used and what are the advantages and disadvantages of MBIs compared to regulatory instruments. Chapters 3.3-3.5 introduce more in detail most commonly used MBIs, such as, environmental taxes and charges, deposit refund systems and tradable permits. Short insights are given into environmental subsidies and other instruments, instrument mixes and ecological tax/fiscal reform, etc.

Chapter 4 focuses on auditing MBIs. It presents the opinion of SAIs regarding what the opportunities and possible risks in auditing MBIs are. There were 10 cases selected to illustrate the diversity of auditing different MBIs in different environmental areas.

## Methodology

The main methodology used in chapter 2 and 3 has been literature review. There is vast amount information available on MBIs. Main sources for information have been reports and article produced by highly accepted international organisations like OECD, United Nations Environmental Programme (UNEP), European Environmental Agency (EEA), World Bank (WP) etc and leading experts and scientists in this area.

Chapter 4 is focusing on auditing issues and it is compiled mainly on information collect from SAIs via INTOSAI WGEA mini-survey, questionnaires and direct contacts.

The audit case collection template was developed to collect the audit cases which are presented in Appendix 2.

The project was led by the National Audit Office of Estonia in cooperation with project subcommittee members of Bhutan, Brazil, Cameroon, Indonesia, New Zealand, the Netherlands, Senegal, and United Kingdom. Special thanks to Dr Stefan Speck from European Environmental Agency for support.

# Governments’ role in making environmental policy

This part gives and introduction to subject of market based instruments (MBI) by explaining the reasoning behind the use of MBIs. It explains the concept of market failure and externalities and governments’ role in overcoming those problems by participating in markets and implementing environmental policy.

## 2.1 Why governments need to make environmental policy?

Governments have an important role in making environmental policies because without governmental involvement human impact can damage the environment and result in overuse of natural resources. Environmental policy focuses on reducing negative impacts on things we value, such as good health or the 'clean and green' environment, and also on incentivising alternative actions which conserve or positively improve the environment, such as land management to improve water storage potential.

Environmental policies aim to achieve their objective by increasing costs to those who pollute or cause environmental damage, curbing polluting behaviour, supporting investments and inducing innovation in less environmental harmful technologies and so forth. (OECD 2014)

*Market failure and externalities*

Market economies are considered to operate efficiently but can fail to reflect all the values of their societies. Competitive markets can provide significant benefits for consumers and producers through greater choice, lower prices and better quality goods and services. Competition can provide strong incentives for firms to be more efficient and innovative, thereby helping raise productivity growth across the economy. However, markets on their own can fail to deliver the best outcomes for the environment and human health.

The reason, why governments need to do environmental policy and „intervene“ in markets are mainly to (Sterner 2003):

* overcome market failures (e. g costs related to pollution, which are not covered by polluters)
* achieve wider policy objectives (e. g changing producer/consumer behaviour)

More specifically a **market failure** is a situation where free markets fail to allocate resources efficiently. There are a number of sources of market failure. The main reasons for market failure are external effects (externalities), undersupply of public goods, non-competitive markets and imperfect information(Braathen 2015).

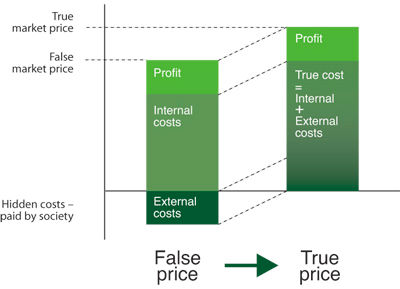
***Externalities*** refer to situation when the production or consumption of goods and services imposes costs or benefits on others which are not reflected in the prices charged for the goods and services being provided (OECD)[[1]](#footnote-1). Externalities can be positive or negative:

* + Positive externalities arise when an individual or firm provides benefits for which it is not compensated (OECD).
  + Negative externalities are the costs arising for society which are not covered by the producer or consumer of a good or service.

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| Examples for positive externalities include:   * Bees kept for their honey pollinate the surrounding crops, thus enabling fertilization and reproduction of the crops * Land kept in agricultural use provides habitats for birds and other animals and scenic value.   Examples of negative externalities include:   * Air pollution from burning fossil fuels. Air pollution causes damages e. g. to public health and buildings. * Climate change as a consequence of greenhouse gas emissions from burning oil, gas, and coal. Climatic change affects weather patterns, affecting agriculture and requiring investment to adapt buildings and lifestyles. * Water pollution by industries that adds effluent, which harms plants, animals, and humans. Water pollution affects the natural resources provided and the cost of providing clean drinking water. * Health problems caused by toxic ingredients. |

Externalities are a loss or gain in the welfare of one party resulting from an activity of another party, without there being any compensation for the losing party, i.e where the polluter doesn’t pay. Internalization of these “hidden costs” into the price of goods should provide true market price without imposing extra costs for the society. True market price or covering the social costs can be illustrated with the following formula and figure 1:

Social costs = private costs (labour, raw materials, machinery, energy etc) + external (environmental) costs



*Figure 1. True market price formulation (externalities)*

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| "Climate change presents a unique challenge for economics: it is the greatest example of market failure we have ever seen."  Stern Review: The Economics of Climate Change (Stern 2006) |

In addition to externalities, the other reasons for market failure are:

***Under-supply of public goods -*** Public goods are those that if made available to one person, automatically become available to others (e. g. clean air, flood control). The private market tends to undersupply these goods since it is difficult to charge people for benefitting from a good or service once it is provided. Therefore government intervention is needed to provide these goods.

***Non-competitive markets, monopolies or oligopolies*** are often obstacles to the optimal supply of goods. Monopolies can lead to under-production and higher prices than would exist under conditions of competition, causing consumer welfare to be damaged. Examples of it are the natural monopolies providing e. g drinking water.

***Imperfect information*** (also called asymmetric information) is the situation where there is lack of, and unequally distributed information which stops the market from operating perfectly. If there is no reliable data on, for instance, pollution damages and abatement costs it is complicated to design policies that are both efficient in resource allocation and fair when it comes to sharing the burdens of all the costs involved. (based on Sterner 2003)

Overall, market failures, such as (negative) externalities, do not meet the polluter pays principle[[2]](#footnote-2) and may cause costs for the whole society. Therefore the intervention of governments into markets is generally accepted.

## 2.2 How governments intervene into markets?

Governments play an important role setting legal and institutional framework within which markets operate and can use their role to intervene in markets to overcome market failures and/or to achieve wider policy, including environmental, objectives.

*Governments’ role/action in markets*

Governments can influence markets throughdirect as well as through indirect participation, including through market based instruments[[3]](#footnote-3):

**Direct participation** is where government acts as a provider or as a buyer (procurer) of goods and services. As a large buyer, a government can use its buyer power to encourage supply of new, environmental friendly technologies. There can be a cost from the use of buying power to support the development of particular requirements for goods or services and the benefits need to be weighed against this cost compared to the cost from economies of scale across markets.

**Indirect participation** is where government introduces command and control regulations or market based instruments, such as taxes and subsidies, trading schemes to influence producers and/or consumers in the market. Regulations to stipulate certain requirements or limit actions play an important role in helping markets function effectively, including supporting wider policy goals, but they can also distort competition. Market-based approaches can be an effective alternative to regulations. Subsidies and taxes can influence the incentives and behaviour of private sector producers in existing markets, for example to act in more environmental friendly way. However, they can also create entry barriers in a market or constitute state aid[[4]](#footnote-4). In this case the government should make sure that the benefit of giving aid outweighs the potential costs of distorting competition.

Alternatively governments can create an additional market, in the good or service to be encouraged or discouraged, for example an emission trading scheme. Rather than intervening through regulation or taxation of emissions, the policy aim of reducing the emissions’ harm to society can be achieved by establishing a market for tradable permits. Tradable permits for emissions allows a competitive market to determine the price producers need to pay for the permits, and should ensure that the pollution is reduced in the most effective way.

*Environmental policy design*

Governments can be expected to follow a policy making cycle (figure 2) to determine and review their best policy approach for securing their environmental objectives. The cycle starts by identifying the issues that need to be addressed, continues with policy formulation, implementation and enforcement, and the cycle is completed with policy evaluation. It is good practice to involve different stakeholders and interest groups in this process, to ensure that policies are built on a strong understanding of the issue and related behaviours and how different approaches might work and to gain acceptance for the adopted policy to secure the best results.

*Figure 2. Policy design circle*

## 2.3 Environmental policy instruments

Governments can use a range of types of environmental policy instruments to implement their environmental policies and deliver against their commitments to international environmental agreements. Environmental policy instruments can roughly be divided into three broad categories (EEA 2006):

1) **regulatory/administrative instruments** (so called "command-and-control"). These are regulations, directives, bans, permits etc which are prescriptive and provide the private sector with relatively little flexibility in achieving goals.

2) **market based instruments** (MBIs) are taxes, charges, levies, tradable permit schemes, deposit refund systems, subsidies etc. These instruments can be used to provide producers and consumers with incentives to change their behaviour towards more efficient use of natural resources by reducing consumption and to look for more effective ways of making environmental progress while giving them flexibility in how they do so (see chapter 3).

Market based instruments can be implemented in a systematic manner, across an economy or region, across economic sectors, or by environmental medium (e. g. water).

3) **voluntary agreements and information strategies/ moral suasion**. These are voluntary environmental measures independent of government requirement, such as bilateral agreements between the government and private firms and voluntary commitments made by firms, e. g implementation of environmental management systems, publishing environmental reports. Voluntary changes in behaviour could be accomplished also via education, transfer of knowledge, training, persuasion etc.

*Figure 3. Classification of environmental policy instruments (based on EEA 2005a)*

# Market based environmental policy instruments

As set out in chapter 2, market based instruments can be used to deliver environmental objectives, including through correcting market failures. This part sets out in more detail what is meant by “market based instruments” and the range of such instruments; and then illustrates how the instruments can work and the complexities and concerns there can be from their operation individually and within a wider policy landscape.

## 3.1 What are MBIs?

*Definition*

Market-based instruments (MBIs) include taxes, charges, fees, subsidies and incentives and tradable permit schemes, also fines, penalties, liability and compensation schemes. MBIs are sometimes referred to as “market-based economic instruments” or “economic instruments” (EIs). (UNEP 2009)

The OECD defines economic instruments as tools that “affect estimates of the costs and benefits of alternative actions open to economic agents” (OECD 1994). Or to put it more simply, if a tool affects the cost or price in the market, then it is a market-based economic instrument. This definition focuses on the economic signals and incentives the instrument provides. If it changes the cost or price of a good (e. g., plastic bag), service (e. g., waste collection), activity (e. g., waste dumping), input (e. g., materials), or output (e. g., pollution) then it is a market-based instrument. (UNEP 2009)

*Why?*

MBIs help to assign the prices of resources that are not appropriately valued on the market, such as water, clean air, ecosystem services, biodiversity, marine resources (ECORYS 2011). They provide producers and consumers with incentives to look for more effective ways of making environmental progress, while giving them flexibility in how they do so.

MBIs can have an incentive effect that results in:

* **a change of behaviour,** or
* **revenue-raising**.

In practice, it is a combination of the two. Goals can also be to “get the prices right” and ensure that the economic cost (the price) reflects the resource cost or cost of the pollution impacts. “Getting the price right” reflects the principle of “full-cost recovery” or “user pays principle.” (UNEP 2009)

In theory, if properly designed and implemented, market-based instruments allow any desired level of pollution cleanup to be realized at the lowest overall cost to society, by providing incentives for the greatest reductions in pollution by those firms that can achieve these reductions most cheaply. (Stavins 1997)

Whether by **influencing prices** (through taxation or incentives), or setting **absolute quantities** (emission trading), or quantities per unit of output, MBIs implicitly acknowledge that firms differ from each other and therefore provide **flexibility** that can substantially reduce the costs of environmental improvements (EC 2000).

*Classification*

MBIs can be classified in different ways. One option is to make a distinction between **price based** and **quantity based** instruments. Price based instruments (taxes, subsidies, deposit refund systems, feed-in-tariffs) are used to lever behavioural change by changing prices in existing markets. Quantity based instruments (tradable permits/ emission trading schemes) influence behavioural change by specifying the ‘amount’ of new rights / obligations and allowing the market to set their price.

European Environmental Agency (EEA) has classified MBIs into five main types (EEA 2005):

1. Environmental taxes (also environmentally related taxes) that have been designed to change prices and thus the behaviour of producers and consumers, as well as raise revenues.
2. Environmental charges that have been designed to cover (in part or in full) the costs of environmental services and abatement measures such as waste water treatment and waste disposal.
3. Tradable permits that have been designed to achieve reductions in pollution (such as emissions of CO2) or use of resources (such as fish quotas) in the most effective way.
4. Environmental subsidies and incentives that have been designed to stimulate development of new technologies, to help create new markets for environmental goods and services including technologies, to encourage changes in consumer behaviour through green purchasing schemes, and to temporarily support achieving higher levels of environmental protection by companies.
5. Liability and compensation schemes that aim at ensuring adequate compensation for damage resulting from activities dangerous to the environment and provide for means of prevention and reinstatement.

In addition, MBIs can be distinguished according to their area of implementation, e. g. transport, energy, pollution (e. g. water, air), use of resources.

*Main principles in using MBIs*

* Environmental effectiveness

The most important point to underline is that any environmentally related MBI should cause change in consumption or production pattern which will lead to reduced environmental burden. If an instrument fails to do that it should be considered whether to change or even abandon the instrument.

* Equity / income distribution

One of the advantages of environmental taxes is their effectiveness on every unit of pollution. Homogenous taxes encourage abatement at the lowest-cost source, helping to ensure that environmental goals are achieved at the lowest social cost.

Nevertheless, policy makers need to consider the impact of such taxes also on sensitive groups such as low-income households or pollution-intensive, trade-exposed businesses. Lower tax rates or exemptions are sometimes put into place to limit impacts on such groups. Generally it is advised not to make exemptions into tax system itself, but rather use other policy instrument to overcome the distributional problems.

* Competitiveness

The aim of economic instruments (especially taxes) is to make activities with higher environmental impact less profitable in economic sense. It means that at the *enterprise* level there are always companies which are better off than others – these are the ones who pollute less or are more efficient in their resource use. The competitiveness issue rises more sharply at a *sector* or *national* level, where taxes or tradable allowance schemes imposed may cause negative impact on international competitiveness (if the instrument is implemented only at local/national level).

* Acceptance, stakeholder involvement

The acceptance of environmental taxes is in good correlation with awareness about environmental problems in society. Opposition to environmental taxes may be caused by not enough information about the purpose of the tax, little trust of assurances how the revenue is used, fear of loss of competitiveness or other reasons. Well-designed taxes are highly transparent in terms of their coverage and costs. It should be clear what is taxed, which polluters are exempt, and what the cost to polluters will be per unit of pollution generated.

Evaluation of which groups are most powerful, and what their primary goal is should take place. Allocation of rights in the baseline is also quite important: groups with existing rights, whether actual or implied, will often have more power/interest in fighting changes to existing policies. The factional analysis should also assess what options exist for buffering any social impacts that may occur from the policy reform, especially those that affect the poor. (UNEP 2004, OECD 2011)

## 3.2 MBIs compared to regulatory instruments

The main reason for using MBIs (rather than regulatory instruments) to achieve environmental colas is mainly matter of cost-efficiency (Fullerton 2010). In short, compared to regulatory instruments, market-based instruments may offer the following advantages:

* They improve **price signals**, by giving a value to the external costs and benefits of economic activities, so that economic actors take them into account and change their behaviour to reduce negative – and increase positive - environmental and other impacts[[5]](#footnote-5).
* They allow industry greater **flexibility** in meeting objectives and thus lower overall compliance costs[[6]](#footnote-6).
* In contrast to regulatory instruments, the use of MBIs gives polluters (firms) an incentive to go further and **reduce pollution more** than required by environmental authorities. In the longer term polluters may pursue **technological innovation** to reduce further adverse impacts on the environment (“dynamic efficiency”).
* They **support employment** when used in the context of environmental tax or fiscal reform[[7]](#footnote-7).

*Taxes*

* Taxes present a good option to manage pollution from **diffuse sources**, where regulatory measures may be more complex to implement and enforce (e. g taxes on fertilizers or car emissions).
* Taxes/charges **raise revenues** that may be used for other purposes, including environmental improvement schemes.

Regulatory instruments often require much more **detailed information** on regulated industries than MBIs, since the government must understand the details of industrial technologies in order to set standards. Command-and-control tools often require more sophisticated regulatory **compliance staff**. In some cases, MBIs can help substitute for weak institutions in circumstances where the parties who buy rights monitor cheating on a decentralized level - so long as sanctions can be taken against cheaters once detected. (UNEP 2004)

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| **Efficiency of MBIs**  Empirical studies in the United States (US) show that the efficiency gains associated with using economic instruments rather than command-and-control have been substantial. Tietenberg suggests that approaches to regulate air pollution were as much as 22 times as expensive as the least-cost, market oriented alternative. For the eleven applications studied, command-and-control approaches were on average six times as expensive. Anderson et al. estimated that as of 1992, economic instruments for air, water, and land pollution within the US had saved more than US$ 11 billion relative to a command-and-control baseline. (UNEP 2004) |

*Main concerns using MBIs*

Though there are many successful examples of using MBIs, there are reasons why MBIs have not succeeded and regulatory and other instruments might be more successful in achieving the objectives.

There are studies (UNEP 2004; Fullerton 2010) that indicate that MBIs are not always best instruments for achieving change in behaviour. Following situations should be considered carefully:

* **Emergency conditions.** When problems have severe implications, emergency conditions arise, and behaviour needs to stop immediately, directive bans may be more appropriate.
* **Excessive monitoring costs.** Where monitoring costs are too high to achieve a specific environmental outcome, as when there are a large number of very small transactions (e. g., emissions trades), regulations may be a better fit.
* **Fragmented authorities.** Where authority to set and enforce regulations is highly fragmented across institutions, oversight of market-based instruments might become quite difficult.
* **Illegal activities.** MBIs can encourage cost-avoiding damaging activities, such as illegal waste dumping.
* **Strong opposition.** Where political power and interest group factions remain strong, policy makers need to judge the most prudent course.
* **High level of dislocation.** Where large numbers of people will be displaced or unemployed as a result of MBIs, caution is required.
* **No ability to make transitional payments to affected sectors.** From an economic perspective, it is more efficient to remove broad-based subsidies and replace them with direct payments to the poor. Examples include transitional subsidies to water, energy, and foodstuffs for the poor segment of society. However, in corrupt societies, the transfer payments to the poor are unlikely to actually occur. Thus, monitoring and enforcement are essential to avoid broad based subsidies remain to avoid widespread hardship or social unrest.
* **International competitiveness.** Taxes on industrial inputs increase the costs of production. If the domestic production competes with the foreign producers (without the tax) then it may harm the competitiveness of domestic firms.

## 3.3 Environmental taxes and charges

The most common MBIs in use are environmental (or environmentally related, green) taxes and charges.

Environmental taxes include all environment-related taxes, charges, excises and state fees which are recorded as taxes in national accounts. The base of an environmental tax is a physical unit (or a proxy of it) of something that has a proven specific negative impact on the environment - pollutants or on goods whose use produces such pollutants. (OECD 1997 and EC 1997). By seeking to reduce polluting behaviour, environmental taxes by definition are intended to alter production decisions and to have a disproportionate impact on polluters (OECD 2011). Accordingly, environmental taxes can be either explicit (taxes directly on emissions) or implicit (taxes on inputs or related goods). Economic theory suggests that direct taxes on polluting emissions will reduce environmental harm in the least costly manner, because they give polluters an incentive to reduce their pollution up to the point where further reduction would cost more than paying the tax, and to do so in the least costly way. (TPC 2007). But this approach is not necessarily applied as it might lead to high administrative and compliance costs.

*Taxes* are generally considered to be unrequited payments to (usually) national or regional governments with no individual counterpart service received in exchange for the payment. *Charges*, on the other hand, are typically payments made in exchange for a service, with the charges usually levied in proportion to the quantum of service received, and so the terms ‘user charges’, or ‘cost recovery charges’ are often used in this context. (Hogg et al 2014) Environmental taxes and charges can be based on emissions, inputs and outputs. (Eftec 2004)

A market-based tax approach settle on a maximum cost for control measures. There is no cap on pollution allowed; the quantity of pollution reduced depends on the chosen tax rate. Faced with the direct costs of their polluting activities, firms have an incentive to control pollution (at a lower cost than the tax rate). At the same time, they are free to choose the most efficient reduction methods.

***Main concerns related to environmental taxes:***

There is a risk that companies subjected to taxes (e. g. carbon pricing) are at a **competitive disadvantage** to companies that do not face such costs. This may result in industries that are subject to a climate policy moving their production to countries without such taxation, reducing the employment opportunities and the economic output within the acting country. Alternatively, they may lose market shares against competitors that do not face a carbon price (Greene 2013). Many large users of carbon resources in electricity generation, such as the United States, Russia, and China, are resisting carbon taxation for this very reason.

Finding the **proper level of taxation** is critical to the effectiveness of the instrument because it is difficult to anticipate exactly how much pollution reduction will result from any given tax (Hatch 2005).

Opposition to increased environmental taxes often focuses on concerns that firms **might relocate and/or people might lose their jobs**.

The introduction of some taxes (e. g carbon tax) can have a **regressive impact**, as low-income households tend to spend a higher share of their income on energy bills and energy intensive goods. In the end, however, the final distributional impact of carbon pricing depends on the government’s allocation of the revenues raised or expenditures saved through the carbon pricing mechanisms (Greene 2013).

Taxes and charges provide clear cost signals, but are less effective in guaranteeing a given environmental outcome and hence ensuring that **targets are met**.

There can also be conflict between objectives with a tax: **less pollution means less revenue.**

## 3.4 Deposit refund systems

A deposit-refund system' (DRS), or advance deposit fee, is a surcharge on a product when purchased and a rebate when it is returned. Deposit-refund schemes require paying a deposit on the purchase of potentially polluting products, which is refunded when the products or their residues are returned for recycling or disposal. The refund is not necessarily equal to the deposit. It may be lower, including a handling fee for the recycler (as in the Swedish return system for aluminium cans and PET bottles), or higher if there is a long period between paying the deposit and receiving the refund (as in the earlier deposit-refund scheme for car hulks in Sweden). (EEA 2005a)

While most commonly used with beverage containers it can be used on other materials including liquid and gaseous wastes. Deposit-refund systems are used on products such as batteries, tires, automotive oil, consumer electronics, shipping pallets etc.

The biggest advantage of deposit-refund systems is to reduce generation of waste (which might be dumped) and littering by giving a financial incentive for consumers to return the product back to producers Deposit-refund systems can be both voluntary and mandated by legislation.

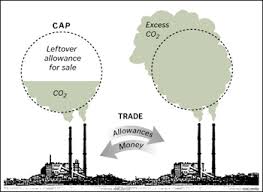
***Main concerns related to deposit refund systems***

Deposit-refund systems are considered to be more cost-effective than other methods (regulations, subsidies) of reducing waste disposal, but relatively **high administrative costs** of a deposit system could outweigh these cost savings (Palmer 1997).

If the DRS is implemented in one region or country and the product is subject to export (e. g beverages) then domestic producers might have an **competitive disadvantages** compared to foreign producers (Hogg 2010).

## 3.5 Tradable permits

**Market-based tradable (also transferable) permits** or cap-and-trade scheme sets a limit on access to a resource (the cap) and then allocates it among the users in the form of permits (Tietenberg 2003). Under a tradable permit system, an allowable overall level of pollution or use of resource is established and allocated among firms in the form of permits. Firms that keep their emission levels or resource use below their allotted level may sell their surplus permits to other firms or use them to offset e. g excess emissions in other parts of their facilities (figure 4). (Stavins 2001)

[](https://www.google.ee/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&uact=8&ved=0CAcQjRw&url=https://environmentaleconomics.wordpress.com/2010/05/02/module-6taxes-and-permits-i/&ei=YemTVfrpIYOR7AbCpaOoAw&bvm=bv.96952980,d.bGg&psig=AFQjCNF3iPzXyBX1FjcOlbu0T1cL4_ktgg&ust=1435843269138623)

*Figure 4. Emission trading*

Tradable permits have been designed to achieve reduction in pollution or use of resources in most effective way through the provision of market incentives to trade (EEA 2005a). With tradable permit it is likely to achieve maximum set level (a cap) at a lower cost than other means, and, importantly, may reduce below that level due to technological innovation.

The most common forms of tradable permits are: emission trading on air pollutants (e. g. EU ETS), emission trading on water quality (nutrients), resource use allowances (e. g. fishing quotas, animal allowances), etc.

In theory different tradable permit systems are analogous, however, there may be important differences between e. g. pollution permit markets and fishing quota markets in practice. For instance, controlling and forecasting emissions from a power plant is arguably easier than predicting both the level of catch on any trip and its composition. This is especially true in multi-species fisheries where fish populations cannot be directly targeted without incidental catch of other stocks. (Newell 2002)

Where regulators have a good sense of the point at which emissions cause health problems or ecosystems begin to fray, tradable permits are often the best choice. Caps can be set in advance, either based on:

* **absolute values** (e. g., tons of salmon that can be caught or emissions emitted) or
* **relative values** (e. g., percent of total allowable catch or emission) (UNEP 2004).

Another important aspect of tradable permits is whether they are auctioned or allocated via free allocation/ grandfathering. There are three main modes of allocating allowances:

* competitive auctioning
* free allocation proportionate to sources’ past emission levels
* free allocation subjected to regular update based on activity levels.

Full auctioning is the most economically efficient approach as it generates budget revenues that can, for example, be used to offset other distortionary taxes and assist with transitional costs. However, some level of free allocation is common practice when trading systems have been introduced. This is generally done to lower the direct financial cost and alleviate concerns about international competitiveness. Within the same system, more than one allocation mechanism can be applied, sometimes differentiated across sectors (OECD 2013).

***Main concerns related to tradable permits***

Emissions trading (ET) offers a dynamic incentive and can help ensure that a given target is met, if combined with appropriate allocation of emission allowances. The price of allowances is, however, **uncertain and determined by the market**. Therefore the costs of pollution abatement are uncertain, and excessive costs could be occurred (Fullerton 2010).

ET can lead to significant **additional administrative** tasks and burdens and greater needs for monitoring, verification and enforcement, the costs of which need to be taken into account in any consideration of whether ET schemes are the sensible solution. An argument against permits is that formalising emission rights is effectively giving people a **license to pollute, which is believed to be socially unacceptable.** However, although valuing adverse environmental impacts may be controversial, the acceptable cost of preventing these impacts is implicit in all regulatory decisions.

When using a transferable-permit system, it is very important to accurately measure the initial problem and also how it changes over time. This is because **it can be expensive to make adjustments** (either in terms of compensation or through undermining the property rights of the permits). (OECD 2008)

## 3.6 Environmental subsidies, incentives

Subsidies are commonly used instruments used by government to achieve environmental objectives. Subsidies have traditionally been used for economic or social reasons, for example to support ailing industries, to help develop vital infrastructure or to protect domestic producers from overseas competition. They can be seen as a way of protecting jobs, either generally or in specific regions, for example support for fishermen to protect coastal fishing communities. The use of subsidies for environmental purposes, however, is a more recent and less well-established policy.

The OECD broadly defines a subsidy as “any measure that keeps prices for consumers below market levels, or for producers above market levels, or that reduces costs for consumers and producers” (EEA 2005; OECD 1998).

There are many types of subsidies, ranging from the most obvious and well-known ones such as

* direct grants, transfers of funds that are clearly visible in some countries’ budgets (i.e. **on-budget** subsidies);
* tax exemptions (which are generally less visible on government accounts, but can be calculated, so called **off-budget**);
* others that are less evident as subsidies (e. g. accelerated depreciation). (IEEP 2007)

Beyond this there are other subsidies that are not always recognised as such: for instance, where prices for goods and services, such as water supply, do not reflect the full costs of provision (i.e. not full cost recovery pricing), or do not reflect the resource costs. A further important category is where there is no internalisation of externalities such as environmental damage (i.e. not following the polluter pays principle).

Subsidies are present in all sectors of the economy. The most common areas where subsidies exist include energy and transport (EEA 2005, pg 101-103). Environmentally related subsidies aim to **encourage more environmentally beneficial behaviour** (e. g introduction of better technologies)**,** but some of them are **environmentally harmful**. These are the subsidies/tax exemptions etc which confer an advantage on certain consumers, users or producers, in order to supplement their income or lower their costs, but in doing so, discriminate against sound environmental practise. (OECD 2005)

***Main concerns related to subsidies:***

* some subsidies are an inefficient use of government resources –notably where the subsidies’ original rationale is no longer applicable.
* some subsidies create environmental burdens – e. g. pollution and climate effect; excessive resource use; or other impacts such as on fisheries stock viability, biodiversity, etc.
* Environmentally harmful subsidies (EHS) lead to inefficient working of the internal market, and overall impacts on competitiveness.
* EHS can hinder innovation by locking in old technologies and locking out new ones and hence undermining the needed innovation developments for a competitive and environmentally-sustainable economy.
* important targets will not be met or be difficult to meet without reforming subsidies – notably meeting CO2 reduction targets. (IEEP 2007)

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| **“Costs” of EHS**  The scale of subsidies with potential negative impact on the environment, notably in the areas of fossil fuels, transport and water, are estimated to be worth a global total of 1 trillion USD. These subsidies lead to higher levels of waste, emissions, resource extraction, or negative impact on biodiversity. (EC 2011). |

## 3.7 Other instruments

*Green Public Procurement*

Green Public Procurement (GPP) is "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured". (EC 2008)

Implementing the green criteria in purchasing is one direct way for governments to influence the market to provide more environmentally friendly goods. GPP can have many direct and indirect environmental benefits. Apart from the direct environmental gains through the purchase of greener products (e. g. less CO2 emission by purchasing electricity from renewable energy sources) it can be a crucial market driver and help create a critical mass of ecological products.[[8]](#footnote-8)

GPP avoids unnecessary purchases by reviewing the actual need for the product or service and seeking other solutions. If this is not possible, public purchasers seek to purchase a greener product or service that supplies the same (or better) quality and functionality as the conventional choice.

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| **Possible savings by implementing GPP:**   * Three million tonnes of CO2 would be saved in the Netherlands alone if all Dutch public authorities applied the national Sustainable Public Procurement criteria, which include green criteria. Public sector energy consumption would be reduced by 10%.[[9]](#footnote-9) * CO2 emissions would be cut by 15 million tonnes per year if the whole EU adopted the same environmental criteria for lighting and office equipment as the City of Turku, Finland - reducing electricity consumption by 50%.[[10]](#footnote-10) |

*Labelling schemes*

As it was mentioned in chapter 2.1, lack of information may also lead to market failures. Therefore governments’ should ensure that sufficient information is provided to the market on products and services. Moreover, the government can create labelling schemes to provide information on products and their environmental and health impacts from their production and their use (e. g organic farming labelling, eco-labels). Such labels can help consumers to choose more environmentally friendly products and services and can lead to consumption shift. Labelling schemes can cover different product/service groups and regions (have a look on examples in table 1).

*Table 1.* *Examples of labels*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Name* | EU eco-label | Energy Star | Forest Stewardship Council | Indonesian eco-label |
| *Country/ region* | regional (European Union) | US, Australia, Canada, Japan, New Zealand, Taiwan, European Union | global | national |
| *Visual* | http://ec.europa.eu/environment/ecolabel/images/flowerlogo.gif | Energy Star logo.svg | FSC logo.svg | Ekolabel: Indonesia logo |
| *Items covered* | more than 30 product groups (e. g chemicals, paper, electronics, coverings etc) | energy using products | forestry (mainly wood) products | forest products, paper, furniture |

## 3.8 Instrument mixes

Any single MBI used alone does not take into account the different categories of polluters or the spatial or temporal heterogeneity of environmental impacts. In reality MBIs are seldom used individually. Rather a number of MBIs are used together or they are combined with regulatory (command and control measures). The main reason for using an instrument mix is that in most cases environmental problems are of multi-aspect nature and no one single policy instrument can alone achieve the goals set (OECD 2007). For example, implementation of explicit and implicit carbon pricing instruments does not always ensure that the highest potential reductions in CO2 emissions are achieved. Creating energy efficiency standards for housing and vehicles and, thus, reducing energy consumption may have a much greater effect on reducing emissions. Therefore, in order to achieve the set goal a mixture of instruments can be used.

In most cases policy mixes are not initially designed as such but rather individual instruments are created separately. Later new instruments are added in order to address the inefficiencies of the existing policies. For example, explicit pricing mechanisms can be complemented by research and technology support policies to address knowledge and diffusion failures of specific emission-reduction technologies, energy labelling to reduce information barriers, energy efficiency building codes to address split incentives between landlords and tenants, and active competition and regulations to limit market power.

It is also very common to use different MBIs together. For example, ETS can be complemented with energy taxation. Supplementing ETS with CO2 taxes can help limit compliance-cost uncertainty by giving polluters the opportunity to pay the pre-determined tax instead of buying a tradable permit, the price of which can be rather volatile at times. (OECD 2007)

## 3.9 Ecological tax/fiscal reform

Ecological (also called green) tax or fiscal reform is not an instrument by itself but rather a wider approach to change taxing or fiscal system in a way which is beneficial both for the environment and socio-economic development.

*Environmental tax reform* is defined as 'reform of the national tax system where there is a shift of the burden of taxes, for example from labour to environmentally damaging activities, such as unsustainable resource use or pollution'. (EEA web) Under ETR, the tax burden is shifted from ‘good’ things such as income and employment and on to ‘bad’ things such as pollution and resource use (2007 IEEP) *Environmental fiscal reform* extends beyond ETR by including subsidy reforms, which entail phasing out subsidies on environmentally harmful activities and products, such as fossil fuels or pesticides, and redirecting public spending towards more socially and environmentally beneficial activities.[[11]](#footnote-11)

There are at least four possible types of effects of ETR:

* it make various goods or activities more expensive
* the direct or indirect distribution of this extra revenue
* job creation and eco-innovation
* effective ETR will also result in environmental benefits, for example by reducing pollution. (EEA web)

One of the challenges of ETR is ensuring that the costs and benefits are appropriately distributed across society, and do not negatively impact the poorest people. Instruments also need to balance the right mix of environmental and economic incentives. Ultimately, ETR mechanisms can only be implemented if they are acceptable to the public and policy-makers. (EEA web)

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| **ETR in Germany**  Between 1999 and 2003 the ecological tax reform raised taxes in Germany for engine fuels, electricity, light fuel oil and gas in small foreseeable stages.  The principle of the ecological tax reform has been to reduce the environmentally damaging consumption of fossil energy; the tax reform has raised taxes for these energy sources. This has created incentives for energy conservation, innovative energy-efficient technologies and the use of renewable energies. In this way, emissions of greenhouse gases and air pollutants have been reduced and oil dependence eased.  The revenue incurred is mainly used for a direct reduction of non-wage labour costs by lowering employers' and employees' contributions to the pension fund. A smaller part is used as support for renewable energy and for the renovation of buildings for energy saving purposes; tax reductions and exemptions are used to support energy-efficient power plants and public transport amongst other things. This helps to support and strengthen climate protection on the one hand; on the other hand, labour becomes cheaper and more attractive.  <https://sustainabledevelopment.un.org/index.php?page=view&type=99&nr=92&menu=1449> |

## 3.10 Market based instruments used in different environmental areas

Different market based instruments can be used in different environmental areas/sectors and countries/regions. Table 2 below provides some examples on environmental taxes/charges, tradable permits used in area of water, energy, biodiversity, air pollution etc.

*Tabel 2. Market based instruments by environmental area/sector (examples)*

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| --- | --- | --- |
| **Area/sector** | **Economic instruments** | **Country examples** |
| Water management | Water resources taxes/charges, water effluent taxes (varying by volume or constituents of discharge), water quality trading schemes | Charges on tap water in Denmark, France, Germany, Netherlands, United Kingdom, Estonia  Water effluent charges in Belgium, France, Netherlands, Estonia, Colombia  Water quality trading in Australia, Canada, New Zealand, United States |
| Sustainable agriculture/ soil protection | Taxes (excise) on pesticides and fertilisers; regulation of discharger to air and water, taxes on fertilizers and mineral surpluses | Taxes on fertilisers and pesticides in EU countries |
| Biodiversity (including forestry) and protected areas | Watershed protection taxes, forest resource tax/cutting fee, park entrance fees, hunting, fishing fees; tradable development permits allowing rights to be used in less sensitive ecosystems. | Payments for Ecosystem Services e. g., BushTender in Australia  Forestry tax (wood consumption) in Brazil, Columbia |
| Fishing | Fishing licence fees, quotas | Fishing quotas in EU countries, Iceland, Canada, United States, New Zealand |
| Marine protection (littering and oil pollution) | Taxes for the product (on fuels, chemicals) and waste. Port reception, ship berthing, oil fund collected from shipping (oil, fuel, ect). | Vessel berthing and registration fees in Malta, Port waste reception fee in UK |
| Waste | Landfill tax/waste disposal, landfill closure fund (insurance, guaranty deposit);  Incineration tax  Taxes on products (tires, batteries, motor oil, packaging ect). Rates often higher on more toxic items.  Deposit/refund systems (cans, bottles, car hulks) to encourage recovery  “Pay-as-you-throw” (PAYT) charges per bag, encouraging participation in recycling programmes | Waste landfill tax in most EU countries (18) All EU countries that have incineration taxes also have landfill taxes.  Producer fee schemes for packaging have implemented in 24 EU countries.  DRF for bottles in Estonia, Sweden  Deposit/refund in households waste (glass and plastic, car batteries) in Colombia, Ecuador, Jamaica, South Korea, Mexico, Sri Lanka, Taiwan, Venezuela  PAYT system in 17 EU countries for municipal waste. |
| Air pollution / climate change (energy and transport sector) | Emission charges on different substances (NOx, SOx, carbon, ozone etc) – industry, transport,  Taxes/excise on fuel, congestion charge, taxes on vehicle, road taxes, toll roads etc.  Feed in tariffs on renewables  Emission trading schemes (national, regional, global) | Carbon tax in Finland, Sweden, Norway, Costa Rica, Estonia, Australia, South Africa (from 2016)  Tax for Climate Change Mitigation in Japan (covers the use of all fossil fuels such as oil, natural gas, and coal, depending on their CO2 emissions).  Feed-in tariff policies in Algeria, Australia, Austria, Belgium, Brazil, Canada, China, Cyprus, the Czech Republic, Denmark, Estonia, France, Germany, Greece, Hungary, Iran, Republic of Ireland, Israel, Italy, Kenya, the Republic of Korea, Lithuania, Luxembourg, the Netherlands, Portugal, South Africa, Spain, Switzerland, Tanzania, Thailand, Turkey, United Kingdom  Local emission trading schemes: New Zealand; Chinese Carbon Market (pilot), Japan City Level Cap-and-Trade, Australian Carbon Pricing Mechanism, Regional Greenhouse Gas Initiative in USA, Quebec Cap-and-Trade System  EU ETS in EU countries  192 parties (191 States and 1 regional economic integration organization) to the Kyoto Protocol to the UNFCCC. |
| Natural (mineral) resources | Resource tax (mining charge, water abstraction charge), waste tax, land rent | Most of countries have resource taxes, some have implemented land or resources rent. |

More information about OECD countries is available in OECD database on environmental taxes: <http://www2.oecd.org/ecoinst/queries/>

# Auditing MBIs

Parts 2 and 3 set out how governments may use market based instruments to deliver environmental objectives, including through correcting market failures, and illustrate the potential advantages of market based instruments and the potential risks from their use. This part addresses how SAIs may audit their governments’ success in using MBIs. Drawing from SAIs’ experience to date, it sets out how SAIs’ mandates can determine how far they can audit MBIs; and how SAIs may be able to review MBIs at the agenda setting stage and policy design or, following their implementation, how SAIs may evaluate their operation and effectiveness.

## 4.1 What should be considered when auditing the use of MBIs?

Depending on the SAIs mandate, but also competence and experience, SAIs can audit different aspects and phases of implementation of MBIs. Information below can give a hint for auditors what is important to look at, which questions to ask and how to set criteria while auditing agenda setting, design, enforcement, supervision, impact evaluation of environmental policy which involve MBIs.

*Setting the agenda*

When auditing the possible implementation of MBIs for conducting environmental policy, the first step is to look at how the agenda was set. Before deciding on the best suitable environmental policy and selecting the best policy instruments, policy makers should gather information about the problems to be addressed (e. g. need to reduce emissions, need to adapt to climatic changes), their scale and impact. It is helpful at the outset to identify why the current markets for goods and services are failing to address the problem – whether it is a problem of the market not providing for the polluter to pay or for public goods or externalities; or potential barriers to new entry to the market for new goods or services. For example there may be price barriers to the introduction of new drought-resistant crops; or finance failures limiting the opportunities relating to investment in energy infrastructure. The nature of the problem to be addressed and the type of market failure will inform the way the environmental objective is framed – for example whether an absolute limit is required or a policy delivering a steady reduction in environmental harm.

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| **Questions to ask in agenda setting phase:**   * What is the problem into which the government should intervene? * Has government studied the problems? * Has government analysed the reasons of failure of existing policy? * Is there a need for (separate) policy? * Is the environmental burden/harm identified (e. g maximum bearable emission limit)? * ... |

Have a look at audit case G in appendix 2 where the United States’ Government Accountability Office assesses the need for a national carbon trading program. The audit mapped the existing market for carbon-related products and the issues concerning the creation of a national system.

*Policy formulation/design phase*

The most important phase in policy making is the selection of suitable instruments to achieve the objectives. In order to do that, policy makers should analyse the possibilities for achieving the objectives identified in the agenda setting stage. In this phase auditors can make sure that in order to know what the best “dosage” of public policies would be, policy makers have identify the magnitude of the externalities, and put an economic value on them. This will allow a comparison of benefits and costs of possible policy interventions (Braathen 2015). For that reason cost-benefit analysis (CBA) should be carried out. Modelling can be used to inform the cost benefit analysis (e. g. forecasting behaviour of consumers when different charge levels are applied on electricity) and assess the interaction of the proposed new policy with existing policies. The policy evaluation which is conducted before actual implementation (so called **ex-ante** analysis) should ensure that the best choices of policy and instruments are made to achieve the objectives.

In this phase auditors may also ensure that indicators are set that allow measurement of the efficiency and effectiveness of the operation of the selected policies and instruments, and at a later stage measurement of performance against the policy objectives. For example, for emissions trading system indicators of trading volumes would show how the market is operating and indicators of emissions by sector would help evaluation of the policy’s performance by comparing data about greenhouse gas emissions before and after the policy change and comparing the rate of progress to the desired goal.

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| EEA suggests that MBIs where they have been applied work better if:   * they are well-designed in themselves and as part of a wider package of instruments * the reasons for having them and how revenues will be used are clearly communicated * the levels at which 'prices' are set reflect both an incentive to producers and consumers to change behaviour and a realistic analysis of affordability. (EEA 2005a) |

See also OECD policy design recommendations for policy makers in Appendix X

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| **Questions to ask in the policy design phase:**   * Were the most suitable instruments selected to achieve the goals? * How did the government select the instruments? Was it analysed properly? * Were the interest groups involved and did they accept the selection of the instrument? What were the arguments pro/against of the instrument by main interest groups? * Were the side-effects of the instrument analysed? * Is the instrument affecting the lower income groups? * Does the selection of instrument hinder the competitiveness? * ET: how was the “cap” selected and allocation of allowances decided? * Were the performance indicators selected to assess the success? * Were the costs and benefits analysed before selecting the MBI? * Was it decided how to distribute the revenues? * How the externalities are calculated and internalized into prices? * .... |

Have a look at audit case B in appendix 2 where NAO of Estonia audited the design of air emission charges. The audit found that, though the aim of the policy instruments was to incentivise investments into greener technologies, the instruments chosen did not produce this result and other instruments might have been far more efficient towards this end.

This topic is also featured in the NAO of Columbia’s audit on effluent charges (Case A); NAO of Czech Republic’s audit on industrial pollution and environmental risks (Case D); NAO of Sweden’s audits on green public procurement (Case F) and climate change related taxes (Case H) ; United States’ Government Accountability Office’s audit on the national carbon trading system (Case G); Netherlands Court of Audit’s report on tradable allowances (Case J).

*Enforcement*

Enforcement phase is the crucial part of implementing the MBIs. Policy should be translated into action, strategies and action plans formulated, institutional and administrative structure decided, resources allocated, control and monitoring mechanisms selected. In this phase auditors should make sure that the baseline conditions for implementing any MBI – basic rule of law, well functioning set of political institutions – are in place and functioning. Weak institutions would quickly render MBIs worthless as firms discover that they can continue operating without paying taxes or buying permits. Both MBIs and command-and-control approaches also require that political institutions punish violators. The risk of corruption demonstrates how the cost of weak institutions on environmental quality can be high. (UNEP 2004)

If the government does not control and monitor the system, then it is difficult to evaluate the success of the MBI.

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| **Questions to ask in enforcement phase:**   * What are the costs for administrating and controlling the implementation of MBIs? * How the revenues are used? * Does the state inspect all of the polluters (companies) during and after the implementation of environmental taxes? * Does the state control the use of resources and pollution level based on the amount of paid taxes or traded allowances? * Are the collected pollution taxes used for the development of environment-friendly technologies and more economical utilization/use of resources? * Are the taxes collected? * ... |

Have a look on audit case A in appendix 2 where the NAO of Columbia audits effluent taxes. This audit finds that, though regional environmental authorities have developed administrative actions related to the invoicing process, it didn’t result in revenue increase or in actual impacts on the control of effluent discharges and the quality of water resources.

This topic is also featured in NAO of Estonia’s audit on pollution charges (Case B); NAO of Finland’s audit on vehicle taxation (Case C); NAO of Czech Republic’s audit on industrial pollution and environmental risks (Case D); NAO of Tanzania’s audit on audits the management of wildlife (Case E); NAO of Sweden’s audits on green public procurement (Case F) and climate change related taxes(Case H); ECA’s audit on EU ETS (Case I); Netherlands Court of Audit’s report on tradable allowances (Case J).

*Policy (ex-post) evaluation*

Lastly, auditors can make sure that policy evaluation is conducted after the policy or project has been implemented (so-called **ex-post** evaluation). This will help to improve the administration of current policy, and contribute to a process of policy modification and improvement. It will also help to improve the choice of instruments in future policy and contribute to better communication with stakeholders and the public about the purpose, operation and effects of policy. In policy evaluation the monitored data and selected performance indicators should be used.

After the evaluation it should be decided whether the policy needs to be changed and adoptions made. If needed, the policy should be revised and policy circle started again. (2006 OECD)

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| **How soon after implementation should a policy or project be assessed?**  There are a number of factors which need to be taken into account:   * Some of the behavioural responses may take time to appear. * However, evaluation too long after the implementation of a new project or policy is likely to mean that some of the relevant economic actors are no longer available to survey or interview. * Also, with the passage of time, the “counterfactual” may become increasingly imprecise. * There is the possibility that the behavioural response to a new policy instrument may partly anticipate its introduction.   (Braathen 2015) |

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| **Questions to ask in policy evaluation phase:**  *Environmental effectiveness*   * Does the state evaluate the policy performance indicators? * Does the MBI help to achieve the goals set (e. g. Are emissions levels or resource depletion rates falling? Are ambient concentrations in the surrounding environment declining? )? * Is the system changed if MBIs do not have impact? * Does de MBI encourage the behavioural changes of companies or citizens?   *Economic efficiency*   * Are costs of emissions rights stable or declining? * Are they less expensive than projected in advance by government or industry? * Are new abatement technologies entering the market? * Are trades being actively used?   *Administration and compliance costs*   * Has the public sector implemented an effective administrative oversight programme for the policies? * How expensive is this to run relative to the value of trades occurring, emissions reductions realized, or anticipated cost of command-and-control programmes? * How expensive are the administrative costs to the private sector relative to those normally incurred under a command-and-control approach? * Are institutions cooperating to achieve the policy objective, or are efforts being blocked?   *Revenues*   * Are user fees sufficient to cover the full costs of providing particular public services? * Are fees appropriately levied on different user groups? * Are environmental taxes high enough to trigger appropriate price increases in the products/production processes of concern? * Are revenues retained to support additional environmental protection efforts or diverted to the general Treasury?   *Wider economic and social effects.*   * Are there noticeable (positive or negative) effects on employment, poverty, trade, competitiveness, growth, or rates of innovation that can be reasonably attributed to the environmental policies being evaluated? * Where these impacts are negative, are they transitory or permanent? * Does the MBI influence the competitiveness of companies? * ...   (used materials: OECD 1997, UNEP 2004) |

Have a look on audit case E in appendix 2 where the NAO of Tanzania audits the management of wildlife. This audit finds that, there was no in depth analysis done at the third year of the hunting term based on criteria set.

This topic is also featured in NAO of Czech Republic’s audit on industrial pollution and environmental risks (Case D); NAO of Sweden’s audits on green public procurement (Case F) and climate change related taxes (Case H); ECA’s audit on EU ETS (Case I); Netherlands Court of Audit’s report on tradable allowances (Case J).

## 4.2 Main risks and opportunities

SAIs may confront several risks while auditing MBIs. These risks can be related to complexity of the topic, but also the SAIs institutional capacity and mandate. At the same time SAIs have many opportunities to contribute improving the use of MBIs. SAIs should keep in mind that MBIs are like other tools (e. g regulations) to achieve environmental policy objectives and are used in many environmental areas, therefore auditing them should be considered, if possible.

Risks and opportunities described in this chapter are provided by the MBI project partners and by other SAIs during the INTOSAI WGEA and EUROSAI WGEA meetings in 2014–2015.

* **Complex and complicated systems, understanding “the nature” and aim of the instrument**

Important risk is the misunderstanding of the instrument(s). For example, it seems rather difficult for auditors as well as for policy makers to get a real understanding of the tradable permit system. E. g. emission trading schemes may cover many sectors of the economy As a consequence of this an audit will be too easily focused on the more peripheral aspects of tradable permits or even on aspects that aren’t relevant at all.

The decision makers – e. g. government and parliament – are involved in the design phase of the instrument. Thereafter politicians need to be courageous enough not to interfere. Only in case when the instrument doesn’t work, or when unwanted side effects occur, decision makers has to think about interventions – but better still to design a flexible system beforehand – that is a system that is capable to adapt to varying circumstances. This is a difficult concept to accept both for decision makers and auditors.

The design and enforcement of (environmental) taxes can be complicated. There are a lot of exceptions and differentiated tariffs, which makes it difficult to audit

*Opportunities*

SAIs can help the government and policy makers in understanding the instruments and to make a government aware of the risk for unexpected interventions that distort a market. SAIs can contribute to a real understanding of MBIs.

Where governments have not adequately assessed the benefits and costs of MBIs, SAIs may usefully conduct their own evaluations and, if they do not have in-house expertise, may wish to employ specialist to do so. It should be considered whether SAI have adequate expertise in the team. Auditing complex appraisal or evaluation models and the resulting evaluations is likely to require specific expertise in these areas, in particular staff with economic expertise. Contracting in such expertise from outside specialist consultancy firms (particularly for modelling) may provide a solution in the event that in-house resources are considered insufficient. Involving external expertise increases the impact of an audit and serves partly as external quality assurance, which is necessary due to the complexity of the area.

* **Difficulties to audit policy objectives and design, and impact of MBIs**

Many SAIs mentioned that they cannot or find it difficult to audit policy objectives and instruments. This can be explained by mandate of the SAI, but also the complexity of the instruments. E. g. proper design of a trading system is a challenge for auditors. It might be risky for the average general performance auditor to dive too deep into the rather technical matter of a trading system. SAIs can found how much the MBI implementation costs and how it operates, but measuring whether the instrument is delivering reduced emissions and behaviour changes would be difficult to assess.

Also possible lack of clear and measurable objectives for the environmental policy is a problem for the evaluation of the effectiveness of the policy instrument. Multiplicity of factors affecting environmental quality further complicates evaluating the added value from MBI. It is difficult to evaluate the extent to which the MBI itself – as opposed to other drivers – contributed to environmental impacts.

MBIs are usually combined with other instruments, especially with regulatory ones (laws, standards, etc). It is difficult to make distinction which of these instruments have had caused e. g. behavioural changes on producers. E. g. in the UK, there are various policy instruments and external factors (e. g. the price of fossil fuels) which may together impact on particular environmental outcomes. It can be very difficult to isolate the effect of an individual policy instrument. The evaluation of policy impacts may therefore be challenging as it likely to involve complex modelling, and SAIs may not have extensive expertise in this area.

There can be other policy objectives than the environmental ones (e. g. social, cultural, economic) and these should be considered while designing, and also auditing the instrument. For example, water tariffs should cover the private costs (operational, investments into water infrastructure – economic objective) and environmental external costs (environmental objective), but the water service should be also affordable for everybody (social objective). It can be difficult to balance environmental, economic/business, social interests.

In relation to MBIs the competiveness issue is an important topic. Concern over competitiveness effects is often a major argument against the introduction of environmental taxes. It is difficult to assess what is more important for the society and for the economic development – environmental objectives or competition in the market.

*Opportunities*

NAOs can at least ask for reasoning of imposing taxes or allowances systems. For example, if the reasoning for imposing the tax has been to cover the external costs, then these external costs must be properly evaluated (externalities detected and analysed) before setting the tax rate.

While SAIs may not wish to second-guess the basis on which departments conduct policy appraisals and evaluations, they can carry out an important role in critically assessing the methodology and assumptions on which a department has conducted such assessments both at the policy development stage and when evaluating impacts retrospectively. A similar approach can also apply to the assessment of future liabilities (see next risk).

Assessment of added-value of an individual policy instrument may include modelling the counterfactual or conducting stakeholder surveys. However, modelling is inherently complex and uncertain. Stakeholders may not wish to provide some of the information you want for reasons of commercial sensitivity.

If designing or conducting the audit the external experts can be involved to ensure the quality of the audit. E. g. in Sweden the leading scientists in economics were involved to give an quality assurance to the report on emission trading. Auditing complex appraisal or evaluation models and the resulting evaluations is likely to require specific expertise in these areas, in particular staff with economic expertise

* **Uncertainties and forecasting of future liabilities**

It is hard to predict 100% how the markets, companies and consumers, are reacting to MBIs. Some instruments may cause opposite reactions. E. g. tax on municipal waste which aims to change citizens’ behaviour (to sort waste) may cause illegal dumping, instead.

Within the EU, feed-in tariffs (long-term pricing ensured by the government) are the primary mechanism for promoting the deployment of low-carbon electricity generation technologies. In the UK, the new type of feed-in tariff (known as “Contract for difference”) create liabilities which are likely to be disclosed within the financial accounts, and these liabilities will depend largely on the future trajectory of wholesale prices. This poses particular difficulties and risks which arise from the extent of uncertainty involved in estimating future wholesale electricity prices.

* **Lack of and incomplete data and control over enforcement**

Lack of data, such as incomplete register of companies subject to environmental charges or environmental quality indicators, can compromise the evaluation of the instrument impacts. It is not easy to find data and indicators to evaluate the behavioural changes of companies or citizens. One reason for lack of appropriate data are deficiencies in monitoring systems.

If the data is not correct, then the conclusions might be misleading. It is also not wise to draw direct links between tax revenues and environmental improvements. For example, if the revenues from waste disposal have decreased, then it can mean that companies dump less waste and recycle more (have changed their behaviour), or that companies avoid paying the tax and dump the waste illegally.

Not all enterprises perform their obligations of paying fees for exploitation of environment. There are deficiencies in controlling measuring and reporting by operators who are obliged to environmental charges/levies.

*Opportunities*

The audit report may contribute to improve policy transparency by disclosing data on the instrument impacts.

SAIs can control whether the enforcement of the policy instrument is effective and efficient.

* **Mandate of SAIs**

Sometimes SAIs mandate does not cover all involved stakeholders. It concerns mainly the private sector, who is usually the one who cannot be audited and is reluctant to provide data.

Some SAIs have restrictions to audit local authorities or certain institutions. SAIs rather audit policy enforcement, than policy objectives and design

*Opportunities*

SAIs have an unique position to be an independent body to evaluate the action of governmental institutions. SAIs should use the opportunity to audit policy instruments – how these are selected, how implemented and what are the results. Environmental taxes and charges, tradable allowances etc are tools to achieve the environmental objectives, therefore it is justified to audit how efficiently, but also effectively these instruments are implemented.

SAIs can cooperate with governmental institutions that have access to data.

* **Political volatility, inflexibility of policies**

Political constraints and short political electoral cycles make MBIs volatile and there does not seem to be right time for an audit. There have been cases where use of an environmental tax is abandoned during the audit and it makes no sense to audit it any more.

Taxing and fiscal policy is often political issues into which SAIs shouldn’t intervene. It may harm SAIs position as an independent body.

Emissions trading schemes and the like are often politically contested, meaning political parties can have strong views about their effectiveness. An audit would run the risk of being seeing to favour one political view over another, depending on the outcome. This political dimension would need careful management.

The policy design does not always incorporate flexibility, and if the market does not deliver on price then the scheme is a failure. The policy design phase needs to consider whether to set a minimum price, or leave this to the market, but this is a policy decision that we would not audit.

*Opportunities*

Instead of policy design phase (which can be politically sensitive) aspect of implementation phase can be audited.

Good quality audits on MBIs can help to improve the use of MBIs and make the system more effective. For example, NAO of Estonia concluded in the audit that the rate of pollution charges of different substances does not depend on the harmfulness of the substances. Differentiated tax rates can lead to substitution of harmful substances with less harmful substances. Policy makers can use this information to improve the tax system.

* **Detecting the fraud issues (supra-national, national level)**

The primary example of fraud is the ‘carousel’ fraud prevalent in the EU ETS in 2009 and 2010 (whereby companies bought EU ETS allowances without paying VAT in some countries then sold them including VAT in other countries, but without actually paying the VAT element to the government); together with other forms of EU ETS fraud including the direct theft of allowances (eg through the illegal transference of allowances through a trading terminal during a fake fire alarm). It is estimated that the extent of fraud across the EU in 2009-10 amounted to at least €5 billion. These frauds affected a number of European registries, including the Dutch, German, Austrian, and Italian registries. The UK registry was not directly affected, largely because of the extent of checks and controls (including a unique dedicated terminal for each trading entity) put in place on trading entities by the UK government department. The establishment of cross-EU trading platforms may have reduced such risks, but the transparency and robustness of current arrangements remains in our view unclear, and this is an issue which may not be adequately covered by individual audit institutions in each member state.

Fraud can take place also at national level. The companies are motivated to lower their operational/everyday costs to be more effective and to make more profit out of every production unit. Therefore they are make efforts to reduce their environmentally related costs, including paying environmental taxes. Usually it should be done via investments into new technologies and solutions, but can happen that the companies do not report correct data on their activities (e. g data about pollution).

*Opportunities*

SAIs can cooperate to identify the problems in supranational level.

At national level the possible fraud can be prevented by inspecting the companies and controlling the credibility of data reported. SAIs can audit whether the governmental intuitions carry on such activities.

In the table below there is more information provided on possible risks and opportunities related to auditing MBIs (based on the information collected from SAIs).

*Table 3. Audit risks and opportunities*

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| **Risks, audit issues** | **Opportunities** |
| **Policy design**  Lack of measurable policy goals  Forecasting future liabilities is a challenge for companies, as well as creates uncertainty about the budget for the government  Revenues of MBIs may not contribute to environmental policy  Polluter pays principle (PPP) is not followed  Environmental, economic and social interests have not been balanced in policy design | Audit can increase awareness of the instrument among decision makers.  Audit can help the policy design by suggesting recommendations.  If the audit is well planned and executed, its findings can help government to correct any flaws in policy design and implementation in order to achieve better results. |
| **Evaluating added value of the instrument**  Diversity of factors affecting the environmental quality does not allow establishing all drivers nor assessing value added by the instrument.  Lack of data makes difficult evaluating the impact of the instrument. | SAIs are well positioned to assess progress against policy objectives. By comparing data from different sources and/or collecting original data auditors may succeed to demonstrate the contribution of MBI to the change of behaviour. |
| **Enforcement of MBI**  Ambiguous legislation hinders enforcement of MBIs e. g. difficulties to collect fees due to unclear provisions  Incomplete register of companies subject to environmental charges  Insufficient monitoring of collection of MBI revenues  Inadequate measurement of environmental behaviour forming the tax basis  Some economic instruments are fairly complex with lot of exemptions and involve significant administrative burden  Shared responsibilities (local, regional, state) reduce the commitment | By analysing the system auditors can demonstrate the key obstacles for enforcement of MBI and suggest amendments. |
| **Risk of fraud**  Insufficient transparency encourages illegal activities with instrument.  Misuse or fraud of financial instrument (e. g. involving VAT) | Pointing clearly at the problem and identifying solutions for remediation vulnerabilities. |
| **Obstacles related to audit activities** | **Solutions** |
| **Competence**  Technically challenging subject  Risk to misunderstand the instrument | Consult with experts. It might be advisable to hire an expert. In case of difficulty to find unbiased expert, it might be possible organise an expert panel. |
| **Low materiality**  Financial impact of MBI can be minor, thus reducing interest to audit | MBIs can be audited as part of wider audit |
| **Mandate**  Sometimes SAIs mandate does not cover all involved stakeholders.  Private companies are involved and they are reluctant to provide data. | One solution could be to cooperate with institutions who have access to data. If raw data is not released, it might be possible to reach aggregated data.  Audit can focus on enforcement, not on policy design issues |
| **Timing**  Political constraints and short political electoral cycles make MBIs volatile and there does not seem to be right time for an audit |  |

## 4.3 SAIs experience in auditing MBIs

In 2014 INTOSAI WGEA Secretariat carried out the mini-survey among the INTOSAI WGEA member SAIs, which included the questions related to SAIs experience in auditing MBIs. Among the 59 replies there were 39 SAIs who reported the auditing of MBIs.

In these 39 reported, the most frequently audited instruments were environmental taxes and charges and emission trading systems, followed by environmental subsidies and incentives, tradable allowances, green public procurement, deposit refund systems, eco-labelling instruments. In addition there were audits on comparing regulatory instruments and MBIs. The most common audited environmental areas were: climate change/air pollution followed by waste management, energy issues, water management, agriculture, sustainable development, fisheries.

Among those SAIs who reported the auditing of MBIs the selection was made to collect audit cases. Please have a look on Appendix 1 which presents the audit cases.

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# Appendixes

## Appendix 1. Recommendations for designing environmental taxes and emission trading systems

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| Recommendations for designing **environmental taxes** (OECD 2011)   * Environmental tax bases should be targeted to the pollutant or polluting behaviour, with few (if any) exceptions. * The scope of an environmental tax should ideally be as broad as the scope of the environmental damage. * The tax rate should be equal with the environmental damage. * The tax must be credible and its rate predictable in order to motivate environmental improvements. * Environmental tax revenues can assist fiscal consolidation or help to reduce other taxes. * Distributional impacts can, and generally should, be addressed through other policy instruments. * Competitiveness concerns need to be carefully assessed; coordination and transitional relief can be effective responses. * Clear communication is critical to public acceptance of environmental taxation. * Environmental taxes may need to be combined with other policy instruments to address certain issues. |

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| Key design features of **emission trading system** (OECD 2013):   * **Setting emission caps.** Emission cap should be set at the level which is lower than the level expected under “business as usual” condition – it should lead to emission reduction. Over-allocation will result in low allowance prices, which weakens the incentive for technology change and investments. * **Coverage of emission sources.** In principle all emission sources of certain pollutant should be covered by its emission trading scheme. Still, the exceptions in coverage may be made if there is a (political) motivation to protect certain sectors (e. g. due to international competition) or if other policies and measures are already in place for certain sectors. * **Allocation of allowances.** Choice of allowance allocation (whether it is full auctioning or free allocation proportionate to past emission levels or subject to regular update) should be made. Full auctioning is the most efficient, but free allocation is common when there are concerns related to competition. More than one allocation system can be applied as well. * **Banking and borrowing (flexibility).** Enterprises covered with the emission trading can be allowed to use allowances today for compliance in the future (“banking”) or to use allowances from a future period for compliance today (“borrowing”). It enables enterprises with long time horizon to plan ahead. |

## Appendix 2. Audit cases

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| **A. Analysis and evaluation of the economic, financial and tax instruments for environmental management in Colombia 2008-2012**  Contraloría General de la República Colombia, 2013 |
| **1. Objective of the audit**  Evaluate the design and the efficiency of effluent charges and their impacts in improving water quality |
| **2. Audited market based environmental policy instrument**  **Effluent charge** is one of the main regulation instruments in Colombia that aims to avoid high levels of water pollution, as well as an important source of funding for state institutions that are responsible for environmental management in watershed level. |
| **3. Audited stages of implementing the instrument**   * policy design, selection of the instruments * enforcement * impact assessment of policy/instrument * adaption/ changes in the system |
| **4. Methodology used to audit the instrument**  Descriptive analysis (structure and evolution of economic instruments), normative analysis (compliance with legislation) and impact analysis (relationship between corporate management and the state of natural resources and the environment) were used. Based on that, questionnaires were directed to the Ministry of Environment and Sustainable Development, the National Authority for Environmental Licenses, National Natural Parks of Colombia, and 33 regional autonomous corporations.  The responses were consolidated and contrasted with previous analysis developed by SAI-Colombia. The analysis and evaluation of the effluent charges took into account the following elements:   * design of the instrument and its consistency with the conceptual framework * implementation level * income level * d) instrument impact in improving water quality. |
| **5. Main findings and recommendations**  It is necessary that both regional and national environmental authorities pay special and urgent priority to evaluate whether effluent charges are being implemented effectively, tracking pollutant concentrations on water bodies. That aspect is relevant since the analysis found many inconsistencies between data used for invoicing and discharges data self-reported by regulated agents.  The Ministry, most of the autonomous corporations and some environmental authorities in large urban centres have made progress in implementing an information system to monitor the evolution of economic instruments. The use of this information system shall be widespread by all entities and gaps and inconsistencies that still occur in several cases must be corrected. |
| **6. Additional information**  Regional environmental authorities have developed administrative actions related to the invoicing process, although that didn’t result in revenue increase nor in actual impacts on the control of effluent discharges and the quality of water resources. |

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| **B. Effect of pollution charges on the reduction of environmental pollution**  National Audit Office of Estonia, 2008 |
| **1. Objective of the audit**  To evaluate whether pollution charges influence entrepreneurs to reduce environmental pollution through investment in environment-friendly technologies. |
| **2. Audited market based environmental policy instrument**  The activities of the Ministry of the Environment in the formation of the system of **pollution charges**, and the activities of the same ministry and its agencies in the collection of pollution charges and issuing of environmental permits were analysed in the course of the audit. Also the allocation by the Ministry of the Environment and the Environmental Investment Centre of the funds received as pollution charges to projects of reduction of environmental pollution was evaluated.  The audit was focused on three main issues:  1. Do the rates of pollution charges imposed with the Environmental Charges Act induce companies to invest in the reduction of pollution?  2. Are pollution charges applied in a manner that ensures their as large effect as possible on the reduction of environmental pollution?  3. Do the financial instruments offered by the state motivate companies to reduce pollution? |
| **3. Audited stages of implementing the instrument**   * policy design * enforcement * impact assessment of policy/instrument |
| **4.** **Methodology used to audit the environmental policy instrument**  **Analysis:** Legislative acts, policy documents, reference documents on best available techniques and the practice of other countries in the application of pollution charges were analysed. information on pollution charge calculations, ambient air pollution, effect of pollution charges on the reduction of environmental pollution surveillance reports; information received from the Environmental Inspectorate and county environmental departments on cases of pollution exceeding the limit values or without a permit (fines and payment of an increased pollution charge); integrated environmental permits issued to existing large incineration plants; contracts on pollution charge substitution and materials related to their conclusion and surveillance;  **Interviews** and explanations were requested from all related authorities.  **Survey of** the biggest polluters (40 companies - the biggest air polluters included also the biggest waste generators). To compile the sample, companies with the biggest emissions of SO2, particulate matter, VOC, NOx in 2001–2006 were ranked, adding also the biggest polluters of 2003 and 2006. |
| **5. Main findings and recommendations**  **Findings:**   * Pollution charges have not always been imposed according to the polluter pays principle * Companies have invested in environmental protection above all if not only the pollution charges but also the legislation have began to require the introduction of new technology * Replacement of pollution charges and project-based financing by the Environmental Investment Centre have not induced polluters to implement more environment-friendly technologies.   **Recommendations:**   * To order research for making proposals for amendments to the conception of pollution charges and to the Environmental Charges Act, in order to identify optimal rates of pollution charges that would induce companies to invest in the reduction of pollution. * To increase the rates of charges for pollutants which can be reduced through the application of BAT. To differentiate between the rates of charges of VOC and heavy metals within the same group, considering the hazardousness of substances. * To decide in the development of the conception of environmental charges to which indicators the increasing of pollution charges will be bound in the long term up to 2030. * For the implementation of pollution charges at increased rates to improve immediately the effectiveness of communication between the Environmental Inspectorate and the county environmental departments. |
| **6. Additional information**  Report in English: <http://www.riigikontroll.ee/tabid/206/Audit/2071/Area/15/language/et-EE/Default.aspx> |

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| **C. Vehicle taxation**  National Audit Office of Finland, 2009 |
| **1. Objectives of the audit**  Was the vehicle taxation of used cars carried out cost-effectively and according to good governance? |
| **2. Audited market based environmental policy instrument**  **Vehicle tax** based on vehicles’ specific carbon dioxide emissions.  Aim of the tax is to steer consumers toward car models with lower emissions |
| **3. Audited stages of implementing the instrument**   * enforcement * adaption/ changes in the system |
| **4. Methodology used to audit the instrument**  Interviews, statistics and analysis of written reports. |
| **5. Main findings and recommendations**  The taxation of used vehicles has raised many difficult EU legal questions in Finland and there have been many implementing problems, which have led to unusually large number of appeals.  From the environmental viewpoint the new vehicle tax based on vehicles’ carbon dioxide emissions so far appears to be working as expected and steers consumers towards car models with lover emissions |
| **6. Additional information**  There have been some improvements in the administration of vehicle taxation since audit.  Abstract in English: <http://www.vtv.fi/en/publications/performance_audit_reports/2009/vehicle_taxation.4339.xhtml> |

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| **D. Funds earmarked for the limitation of industrial pollution and environmental risks**  Supreme Audit Office of Czech Republic, 2012 |
| **1. Objective of the audit**  The aim of the audit was to scrutinise the provision, drawdown and use of funds earmarked for the limitation of industrial pollution and environmental risks. |
| **2. Audited market based environmental policy instrument**  The audit focused on **finances under the Operational Programme Environment**, specifically priority axis 5 – Limiting Industrial Pollution and Environmental Risks. During the audited period priority axis 5 (‘PA5’) fulfilled the function of the MoE’s departmental grant programme – it concentrated solely on limiting industrial pollution and reducing the risks of serious industrial accidents impacting on the environment.  The main auditees were Ministry of the Environment (MoE) and State Environmental Fund of the Czech Republic, which are responsible for grants/funds earmarked in this field. Other auditees were final beneficiaries of these funds. |
| **3. Audited stages of implementing the instrument**   * policy design (selection of the instruments) * supervision/control * impact assessment of policy/instrument * adaption/ changes in the system * use of revenues/distribution |
| **4. Methodology used to audit the instrument**  The audit was focused on evaluation of this area, such as:  At the providers of subsidies:   * whether the relevant programmes/projects/measures are being elaborated in compliance with applicable regulations (compliance audit); and * whether the programmes/projects/measures have been adjusted, managed, and implemented in an economical, effective, and efficient manner (performance audits).   At the beneficiaries of subsidies:   * whether the beneficiary of a subsidy while implementing a given project has proceeded in compliance with applicable legislation and with the provider’s terms and conditions (compliance audit); and * whether it has implemented the project under scrutiny in an economical, effective, and efficient manner and has met the pre-set targets and indicators (performance audits). |
| **5. Main findings and recommendations**   * In the case of PA5 the binding documentation of OP Environment envisages the identification of goals and direct benefits, whereby the direct benefits should not be identical to the goals. The MoE defined goals that were the same as benefits and, as of August 2012 it had not taken any steps to eliminate this problem. * The MoE designed PA5 to ensure that supported projects were linked to fulfilling the requirements of transnational concepts, international programmes and European regulations. However, the indicators set out in the decisions on the provision of a grant make it difficult to quantify the benefit of the supported projects. * The indicators dealing with the achievement of goals and benefits in PA5 were adjusted in 2009. The indicator targeting the usability of new methodologies in practice with a value of 300 used technologies has been adjusted to 5 new BAT or REACH centres, without any qualifying link to the practical use of the centres’ work. * The indicators for projects designed to limit pollution or reduce environmental risks are set up in a way that makes it impossible to quantitatively assess how pollution or a risk caused by a relevant substance was reduced in consequence of the programme’s implementation. The indicators give no information about the actual effectiveness of the use of finances earmarked for reducing the volume of pollutants in the Czech Republic. * In PA5 projects designed by private entities are supported whose output is the creation of pollution information systems or software tools in connection with major accidents. The principal expected users of these projects are state and local-government authorities, and organisations founded by the state to prevent and deal with major accidents. However, these bodies’ interest in the outputs of the supported projects is currently nothing more than the private entities’ supposition. No concrete negotiations or agreements on the future use of these tools at an estimated price were presented during the audit. Regional pollution information systems must be linked to authorities and organisations with national competence and to their registers. |

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| **E. Management of Wildlife in Game Reserves and Game Controlled Areas**  National Audit Office of Tanzania, 2013 |
| 1. **Objective of the audit**   The overall objective of the audit was to determine whether the Ministry of Natural Resources and Tourism (MNRT) appropriately manages and monitors wildlife hunting activities and revenue generated in the Game Reserves and Game Controlled Areas.  Specifically, the audit aimed at examining:   * the extent to which the wildlife hunting regulation is enforced by responsible authorities; * Efficiency of the MNRT in monitoring wildlife hunting in game reserves and game controlled areas; * and Management of the collected revenue and allocation of the funds to the required LGAs by the MNR T. |
| 1. **Audited market based environmental policy instrument**   The audit was not directly designed for auditing MBIs, but there are some aspects in this audit which relate with MBIs as per the definition in this form:   * **fines** * **user charges** * **traded permits** |
| **3. Audited stages of implementing the instrument**   * enforcement * supervision/control * use of revenues/distribution |
| **4. Methodology used to audit the instrument**  The methodology used is combination of methods used in performance audits:   * reviewing of different documents related to wildlife hunting enforcement, monitoring and revenue collection in the ministry of natural resources * interviews with wildlife officials responsible for wildlife utilization, anti-poaching and legal officers. * The information gathered was compiled, analysed and presented in various formats. |
| **5. Main findings and recommendations**  *Main findings*   1. Annual assessment of hunting companies was based on 40% utilization of quota and omitted other performance measures. There were no actions taken to substandard trophies. 49% of the 108 hunting permit forms were not filled at all to indicate the habitat or ecology where the animals were hunted. A total of 366 wild animals in 2009 and 2011 were killed without quota allocation. 2. There was no in depth analysis done at the third year of the hunting term based on criteria set. None of the hunting companies submitted annual contribution of 5000 USD during the interim period. During 2009-2011 hunting season there was neither data related to problem animals nor elephant tusks. 3. Revenues estimation was based on previous performance. There was no scientific assessment done to be used as a basis for estimation. 36 companies did not pay the government bills for photographic tourism on time. Consequently the ministry lost a total amount of USD 1.7 million which is equivalent to TZS. 2.7 billion as at 11/12/2012.   The following were some of the recommendation to the Ministry of Natural Resources and Tourism to ensure that:   * rates of fines and penalties charged help to reach the intended deterrent effect. * trophy and habitat quality assessment is carried out * the review of payment of 5,000 USD annually by hunting companies is done to see if it saves the intended purpose, and if not change accordingly. * hunting safari data and data from ant poaching are properly collected, documented and analysed and used in planning and decision making. * tourist hunting database on hunting companies, contribution to community development by hunting companies, or support to improve infrastructure, protection of the environment and contribution towards ant-poaching is developed * controls set for revenue collection are reviewed and full collection is done. * LGAs with wildlife resources use the amount allocated by the Ministry to protect wildlife resources within their jurisdictions and in turn account for the disbursed funds to the Ministry |

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| **F. Green public procurement - is management effectively helping to achieve the climate objective?**  The Swedish National Audit Office, 2011 |
| **1. Objectives of the audit**  The aim of the audit was primarily to determine whether the work relating to green public procurement carried out by the Government, the relevant agencies and the Swedish Environmental Management Council has been focused on reducing emissions in line with the Swedish milestone target for 2020 and whether their management has been effective. |
| **2. Audited market based environmental policy instrument**  The audit focused on the Green Public Procurement (GPP). In 2009 the Swedish government presented a combined climate and energy policy, which the parliament adopted later the same year. In order to reach the milestone target for 2020 for the national climate objective, the greenhouse gas emissions must be 20 million tonnes lower than 1990 levels for the non-trading sector. The climate bill outlines the policy instruments needed to achieve this target and GPP is one of these instruments. |
| **3. Audited stages of implementing the instrument**   * policy design (selection of the instruments) * enforcement * supervision/control * impact assessment of policy/instrument |
| **4. Methodology used to audit the instrument**  Reading and analysing various documents, interviews with relevant parties (Ministries, agencies, organizations), 3 in-depth group interviews with procurement officers working in public sector.  In addition estimates of carbon dioxide emissions from the holding of green cars in the public sector as wells as transaction costs for purchasing these cars. These calculations were carried out to provide a basis for a discussion on how the policy instrument can be used more effectively and efficiently. |
| **5. Main findings and recommendations**   * The National Action Plan for green public procurement should be clearly linked to the climate objective and the other prioritised environmental objectives so as to make clear that the purpose of green public procurement is to reduce adverse environmental impact. * Clear responsibility for coordinating the work on green public procurement should be designated in order to allow focus on common objectives in the area. * The tasks in the National Action Plan for green public procurement should be updated to clarify what tasks apply to the agencies concerned and the Swedish Environmental Management Council. * The information on green public procurement to procuring parties should coincide, to avoid uncertainty among procuring parties. * The ability to designate prioritised product areas in an ordinance should be investigated. |
| **6. Additional information**  It is difficult to audit the effects of the GPP instrument because of the lack of statistics in the area. This is a common problem for the instrument throughout Europe and not only a problem in Sweden. Statistics was available on only one product group - the green cars in public sector. With the help of this statistics it could be possible to estimate how large the reduction in emissions could be when procuring green cars instead of conventional cars.  Full audit report in English:  <http://www.riksrevisionen.se/en/Start/publications/Reports/EFF/2011/Green-public-procurement--is-management-effectively-helping-to-achieve-the-climate-objective/> |

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| **G. Carbon Trading: Current Situation and Oversight Considerations for Policymakers (GAO-10-851R)**  United States’ Government Accountability Office, 2010 |
| **1. Objectives of the audit**  This report provided information on   1. carbon-related products currently traded in the United States and the extent of trading; 2. risks and challenges posed by these products; 3. the extent to which and how these products are regulated; and 4. issues that market observers identified for policymaker consideration as part of creating a national cap-and-trade carbon market. |
| **2. Audited market based environmental policy instrument**  In an effort to reduce carbon, some have suggested capping emissions and allowing them to be traded in secondary markets just as other commodities are traded. The policy instrument reviewed was a possible national **carbon trading program** that would price carbon emissions and trade them to assist producers with complying with emissions caps. |
| **3. Audited stages of implementing the instrument**   * policy design (selection of the instruments) * supervision/control |
| **4. Methodology used to audit the instrument**  We reviewed   * congressional testimonies and federal laws; * studies and reports from GAO, other Congressional offices, from professional associations, academics, and the World Bank; and * data and opinions from   + U.S. and foreign futures market regulators,   + U.S. and foreign futures markets,   + financial industry associations,   + academic experts on carbon trading, and   + representatives from a carbon emitter and a financial institution. |
| **5. Main findings and recommendations of the report**   * In 2009, a variety of carbon products traded in the United States, but trading volumes were small, and most trades took place on organized exchanges rather than in over-the-counter (OTC) markets, which meant that the U.S. futures market regulator generally had jurisdiction over this activity. * Carbon products traded in the U.S. carbon markets had risks similar to those posed by other commodity products and had experienced problems (including fraud) domestically and internationally. * The risk that political or regulatory changes could affect the carbon markets was a concern, but market observers noted it could be mitigated in the program’s design. * Market observers in the United States and elsewhere identified several issues for consideration by policymakers relating to the design and regulation of a carbon market if the United States creates a national cap-and-trade program:   + The level at which emissions caps are set in primary markets can affect secondary markets’ liquidity (the ability to buy or sell without causing large price movements.   + Allowing participants to hold or “bank” allowances or having the allowances expire after a certain time period could also affect secondary market trading, with allowance banking encouraging longer-term financial products.   + Ensuring that adequate and timely requirements are in place to register allowances also could help maintain the integrity of the secondary market for carbon products.   + Market participants and observers supported allowing carbon products to be traded in OTC markets as well as exchanges.   + Additional mechanisms to better ensure effective oversight and interagency coordination could be important to the success of U.S. carbon markets, including that the U.S. futures regulator has full authority over carbon trading and sufficient resources to oversee this trading.   + U.S. regulators must interact and cooperate with other domestic and international bodies, including using formal memorandums of understanding with these organizations that specify how such interactions occur. |
| **6. Additional information**  Lessons learned from the audit:   * Speak with a range of market participants, regulators, and experts. * Uncertainty over design of markets and applicable national policies and regulations can limit conclusions about activities. * Adequacy of the resources available to regulators is important. |

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| **H. Climate-related taxes – Who pays?**  The Swedish National Audit Office, 2012 |
| **1. Audit objectives**  The purpose of the audit was to assess whether agency and Government reporting of household and trade and industry expenditure for climate-related taxes was transparent and survivable.  The audit proceeded from the following audit questions:   * Are there significant distribution effects, that is, differences in how much different polluters have to pay for their emissions? * Do Government and agencies report the substantial distribution effects that may exist? * Does the Government provide sufficient information to the Riksdag on measures and effects in relation to binding and optional objectives with different time horizons?   The foundation of the audit's points of departure included the Riksdag's decisions on Government Bills relating to climate and energy and the Riksdag's guidelines for tax policy. One point of departure was that the climate-related taxes should contribute to cost-effective reductions in emissions, partly with reference to the competitiveness of trade and industry. Furthermore, the taxes should be coordinated with other policy instruments – such as trade in emission allowances. The polluter pays principle should also apply. Significant distribution effects of climate-related taxes in combination with other policy instruments needed to be surveyed and analysed in order to assess the need for the reporting and accounting of such effects. |
| **2. Audited market based environmental policy instruments**  **Carbon dioxide tax and other climate related taxes**  Trade and industry expenditure for allowances in the EU Emissions Trading System.  The EU Emissions Trading System is not a direct central government initiative, but a significant policy instrument for reducing carbon dioxide emissions from installations in the EU. Both the carbon dioxide tax and the allowances put a price on carbon dioxide emissions. |
| **3. Audited stages of implementing the instrument**   * policy design (selection of the instruments) * impact assessment of policy/instrument * adaption/ changes in the system * use of revenues/distribution |
| **4. Methodology used to audit the instrument**  Besides studying documents, the Swedish National Audit Office investigated how much trade and industry in general and the industrial and energy sectors in particular pay in climate-related taxes and, where applicable, for emission allowances in the EU ETS.  As regards the trading sector’s expenditures for emission allowances, the Swedish National Audit Office used historical data and projections for future prices of emission allowances (EUA) within the EU ETS. The data was purchased from Thomson Reuters Point Carbon. |
| **5. Main findings and recommendations**  Climate-related taxes lead to distribution effects, both between households and trade and industry, between different types of households, between the trading and the non-trading sectors and between various trade and industry sectors. The polluter pays principle is one of the Riksdag's (Swedish Parliament) points of reference for tax policy, but it is not applied to its full extent. There are major differences with respect to how much different polluters pay for emissions. Climate-related taxes and the EU Emissions Trading System are not the same type of policy instrument, but in practice their combined effect has been to increase these differences.  Both the EU Emissions Trading System and the carbon dioxide tax mean that there is a price on carbon dioxide emissions, but companies in the trading sector have in practice paid very little, in some cases nothing, for emissions. This is due to reductions in and exemptions from climate-related taxes. This is also due to Swedish companies having obtained a completely free allocation of allowances and that the availability of emission allowances has been favourable because the cap has been high in relation to actual emissions. The total emissions in the EU Emissions Trading System can only be changed if the cap for the total emissions in the trading system is changed.  In addition, every year from the start of the Emissions Trading System in 2005 (*until the point of time the audit report was published*), the trading sector in Sweden has been allocated far more emission allowances than it has required. In this way, some installations and trade and industry sectors may have received considerable income without having had to reduce emissions or to take action to reduce emissions. To the point of time when the audit was published, the surplus of allowances that have been allocated free of charge to Swedish companies constituted a redistribution which could be estimated to a value of approximately SEK 1.8 billion. However, if allowances are sold, a taxable revenue is generated which may reduce the value of this surplus.  **Recommendations** (quoted in present tense)  The Swedish National Audit Office makes the following recommendations to the Government in order to achieve a better analysis and reporting. Ultimately, these recommendations are intended to produce good bases for making decisions that will lead to the long-term achievement of the climate objective at a reasonable cost. Good bases for decision-making are also necessary in order to assess whether climate-related taxes in combination with other policy instruments fulfil the polluter pays principle and to assess the risk of carbon leakage.   * The Government should report comprehensively on how great the polluters' costs for climate-related taxes and emission allowances are in relation to the volume of emissions. Reporting should encompass trade and industry and households, different types of household, various trade and industry sectors and the trading and the non-trading sectors. Such reporting is important in order to determine an appropriate structure and scope for various Swedish policy instruments so that the climate objective can be achieved at a reasonable cost. It is also important in order, for example, to assess whether claims for compensation from various groups are well founded and whether there is a risk of carbon leakage. In addition, bases are necessary for negotiations on the structure of the EU Emissions Trading System in forthcoming trading periods. * The Government should guarantee that the agencies provide information to the Government to facilitate such reporting. * The Government should designate a clear responsibility for the coordination of continuous data collection, analyses and comprehensive reporting of the costs for and effects of the climate-related taxes, the Emissions Trading System and the interaction between these policy instruments in relation to the development of emissions. This is necessary because the analyses that are currently conducted are fragmentary and do not provide the overall picture which would be needed to make well-founded decisions in order to make the climate-related measures more effective. Coordination responsibility should be designated as soon as possible so that the work on specifying and assembling the necessary statistical basis and relevant analysis tools is secured in good time for the in-depth reporting in Checkpoint 2015. |
| **6. Additional information**  We hired two of Sweden’s leading scientists in economics as quality assurers of the audit report, from an economic perspective. These two experts are professors of two different Swedish Universities.  Our opinion is that such external quality assurance is necessary due to the complexity of the area, and in order to increase the impact of an audit.  Full audit report in English:  <http://www.riksrevisionen.se/en/Start/publications/Reports/EFF/2012/Climate-related-taxes--Who-pays/> |

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| **I. The integrity and implementation of the EU Emission Trading Scheme**  European Court of Auditors (ECA), 2015 |
| **1. Objectives of the audit**  The main audit question: Is the European Union Emissions Trading Scheme managed adequately by the Commission and the Member States?  Sub questions:   1. Is there an appropriate framework for protecting the integrity of the EU ETS? 2. Is the EU ETS correctly implemented? |
| **2. Audited market based environmental policy instrument**  The **EU ETS** is the world’s biggest cap and trade system for greenhouse gas emissions. Its goal is to reduce greenhouse gas emissions, and the higher the price of carbon, the greater the incentive. It has evolved from its introduction in 2005 to cover 11 000 energy intensive installations which emit around half of the EU’s greenhouse gas emissions. The scheme works by putting an overall limit (decreasing over time) on the emissions of greenhouse gases. Allowances are distributed to installations (more and more by means of auctions), which must respect their caps, and if they do not have enough allowances to cover emissions, must acquire more on the carbon market, or reduce emissions. The carbon market is open to participation for investors and indeed most of the market is in derivatives.  For the EU ETS to work as intended, the integrity of the market must be protected, and the scheme should be correctly implemented. This audit focused on market integrity and implementation (and not on whether the overall policy objectives were being achieved). |
| **3. Audited stages of implementing the instrument**   * enforcement (including market supervision and oversight, and penalties) * supervision/control (including ETS registry system, reporting requirements, monitoring and control framework, coordination, and guidance) * adaption/ changes in the system (referring to adaptations / changes in the control and supervisory framework, rather than changes targeting the impact of the ETS) * the audit also considered legal status of allowances |
| **4. Methodology used to audit the instrument**   * Interviews and documentary reviews at relevant European Commission services; * Visits to five Member States, where the authorities responsible for implementing the ETS were interviewed, and relevant documentation examined. Desk reviews of documentation for two other Member States; * Substantive testing of relevant ETS documentation relating to 150 installations in those seven Member States; * Consultations with interested NGO’s; * Expert assistance. |
| **5. Main findings and recommendations**  ECA will provide these after the publication of the report. This should be around June 2015. |
| **6. Additional information, remarks** *(what should be considered while auditing MBIs, response of government, impact of the audit etc)*  ECA will provide these after the publication of the report. This should be around June 2015. |

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| **J. Tradable allowances and the environment**  Netherlands Court of Audit, 2013 |
| **1. Objectives of the audit**  The objective of the audit was to evaluate whether pollution charges influence entrepreneurs to reduce environmental pollution through investment in environment-friendly technologies. |
| **2.Audited market based environmental policy instrument**  In 2013 systems of tradable allowances (e. g. CO2 emission allowances, NOx emission allowances, animal allowances (for pigs and poultry), milk quota and fishing quota ) were under review or in the process of being wound up. Our objective was to give members of the Dutch House of Representatives more insight in the dos and donts of the instrument concerning its application in environmental matters. 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. |
| **3.Audited stages of implementing the instrument**   * policy design (selection of the instruments) * enforcement * impact assessment of policy/instrument * supervision/control |
| 4.**Methodology used to audit the instrument**  This audit was based on material in the public domain, including audit reports previously published by the NCA done in the previous years concerning CO2, fish quotas and animal allowances. However, these audits do not directly evaluate the instrument of the tradable rights itself, but focus more on topics like measurable objectives, supervision and sanctions and the like – the topics the NCA is known for. Because of the usually general approach of policies the audits don’t dig into the instrument itself  Besides we consulted some economists in the Netherlands specialized in tradable permits. We asked them for instance to give their comments of the concepts of the report. |
| **5.Main findings and recommendations**  There were no main findings. The report as a whole is more or less just a set of recommendations. |

## Appendix 3. Recommended literature

Subject for improvements

**General**

Panayotou, T. (1994) *Economic Instruments for Environmental Management and Sustainable Development*, United Nations Environment Programme.

UNEP (2004) *The Use of Economic Instruments in Environmental Policy: Opportunities and Challenges*.

Stavins, R.N. (1998) *Market-Based Environmental Policies*, Resources for the Future Discussion Paper, No. 98-26.

Huber, R.M.; J. Ruitenbeek and R. S. da Motta (1998) *Market Based Instruments for Environmental Policymaking in Latin America and the Caribbean: Lessons from Eleven Countries,* World Bank Discussion Paper, No. 381.

Eftec (2004) *A Compendium of Economic Instruments for Environmental Policy.*

EEA (2006) *Using the Market for Cost-Effective Environmental Policy: Market-based Instruments in Europe*, EEA Report, No. 1/2006, Office for the Official Publications of the European Communities.

Sterner, T. (2003) *Instruments for Environmental Policy*, SIDA.

**Environmental taxes and charges**

Greene, J. and N. A. Braathen (2014). *Tax preferences for environmental goals: use, limitations and preferred practices*, *OECD Environment Working Papers*, No. 71, OECD Publishing. <http://dx.doi.org/10.1787/5jxwrr4hkd6l-en>

Milne, J., Andersen, M. (2012) *Handbook of research on environmental taxation,* Edward Elgar PL.

OECD (2008). *Environmentally Related Taxes and Tradable Permit Systems in Practice*, OECD Publishing.

**Tradable permits/emissions trading/allocation of resources**

OECD (2008). *Environmentally related taxes and tradable permit systems in practice*, OECD Publishing.

OECD (2011). *Interactions between emission trading systems and other overlapping policy instruments*, OECD Publishing.

Isaacs, M. (2011). *Individual transferrable quotas, poverty alleviation and challenges for small-country fisheries policy in South Africa*.

NAO of Netherland (2013). *Tradable allowances and the environment.*

**Environmental subsidies, incentives**

Valsecchi C., et al. (2009). *Environmentally harmful subsidies: identification and assessment, final report for the european commission’s dg environment.*

**Ecological tax/fiscal reform**

Heine, D., Norregaard, J. and Parry, I.W.H. (2012). *Environmental tax reform: principles from theory and practice to date*, IMF Working Paper, No. 12-180.

OECD (2004). *Green tax reforms in OECD countries: an overview*, OECD Publishing.

*OECD (2005). Environmental fiscal reform for poverty reduction.* [*http://www.oecd.org/greengrowth/green-development/34996292.pdf*](http://www.oecd.org/greengrowth/green-development/34996292.pdf)

*World Bank (2005) Environmental fiscal reform: what should be done and how to achieve it.* [*http://siteresources.worldbank.org/INTRANETENVIRONMENT/Publications/20712869/EnvFiscalReform.pdf*](http://siteresources.worldbank.org/INTRANETENVIRONMENT/Publications/20712869/EnvFiscalReform.pdf)

**Instrument mixes**

OECD (2007). *Instrument mixes for environmental Policy*, OECDE Publishing.

OECD (2007). *Instrument mixes addressing non-point sources of water pollution*, OECD Publishing.

OECD (2011). *Interactions between emission trading systems and other overlapping policy instruments*, OECD Publishing.

**Implementing market based instruments**

OECD (2005) *Analytical Framework for Evaluating the Cost and Benefits of Extended Producer Responsibility Programmes*, OECD Publishing.

OECD (2006). *The Political Economy of Environmentally Related Taxes*. OECD Publishing.

OECD (2008). *An OECD framework for effective and efficient environmental policies*. OECD Publishing.

Pearce, D., Atkinson, G. and Mourato, S. (2006). *Cost-benefit analysis and the environment: recent developments*. OECD Publishing.

1. OECD Glossary of statistical terms. <https://stats.oecd.org/glossary/> (June 2015) [↑](#footnote-ref-1)
2. The polluter-pays principle is the principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution (UN 1997) [↑](#footnote-ref-2)
3. OFT (2009) Government in markets. [↑](#footnote-ref-3)
4. State aid is defined as an advantage in any form whatsoever conferred on a selective basis to undertakings by national public authorities. Despite the general prohibition of state aid, in some circumstances government interventions is necessary for a well-functioning and equitable economy (European Commission, DG competition) [↑](#footnote-ref-4)
5. This idea is often expressed by objectives such as "getting the prices right", "internalisation of external costs", "expanding the supply of non-marketed environmental services". [↑](#footnote-ref-5)
6. Cf. EEA, Effectiveness of urban wastewater treatment policies in selected countries: an EEA pilot study, 2005. The study compares approaches between several MS and demonstrates how the use of market-based instruments will help meet environmental objectives at lower costs. [↑](#footnote-ref-6)
7. Cf. Commission Communication “European values in the globalised world" - COM(2005) 525, 20.10.2005. Have a look on chapter 3.9 [↑](#footnote-ref-7)
8. European Environmental Bureau <http://www.eeb.org/index.cfm/activities/sustainability/green-public-procurement/> [↑](#footnote-ref-8)
9. *De impact van het programma duurzaam inkopen anno 2011* (Dutch Ministry of Infrastructure and Environment, 2011) [↑](#footnote-ref-9)
10. *Green procurement makes a difference: Prime examples from the Nordic countries* (Nordic Council, 2009). [↑](#footnote-ref-10)
11. Many papers do not make difference between „tax“ and „fiscal“ reform, thought the later one is seen in wider perspective than just making changes in taxing system. [↑](#footnote-ref-11)