AN INVESTIGATION OF INTERNATIONAL ENVIRONMENTAL TAX PRACTICES IN SELECTED COUNTRIES

by

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ABSTRACT

Globally, the temperature is rising and some of the consequences are starting to show. This effect is known as global warming. The issue of global warming and environmental pollution is more serious than people realise as it is the starting point of potentially catastrophic events to come. The implementation of global emission reductions is imperative in order to prevent further global warming.

All countries should be actively involved in the prevention of further global warming and the reduction of pollution. With the use of a comparative analysis of various environmental taxes internationally, the countries with established environmental tax frameworks can be used as a basis for the development of effective environmental tax frameworks in developing countries. This will ensure that developed as well as developing countries will be held accountable for their emissions and hopefully will make efforts to reduce their emissions.

South Africa has very few environmental tax policies and the existing acts are not sufficient to ensure the effective reduction and management of its emissions.

Successful environmental tax policies are those that are economically viable and easy to implement. This is achieved through successful implementation by the tax authorities as well as the taxpayers’ cooperation and acknowledgement of these policies.
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Chapter 1

Introduction

1.1 Background

“We can no longer afford to view global warming as a political issue – rather, it is the biggest moral challenge facing our global civilization.” (Gore, 2006).

In the past world leaders used the promotion of “going green” as a front to get ahead economically and politically. However, it has become evident that the issue of global warming and environmental pollution is more serious than people realise as it is a catalyst for catastrophic events that endangers the sustainability of life. Globally, the temperature is rising and some of the consequences are starting to show. The ice at the earth’s poles is starting to melt and sea levels are rising more than ever. Certain species of plants and animals have migrated north to the cooler areas (National Geographic, n.d.). The introduction of greening taxes might provide a way to address this as industries will be more careful when they pollute the environment if or when they face financial repercussions for abusing natural resources.

Greening taxes and environmental taxes are one and the same. Both terms are used interchangeably. These are excise taxes payable by the producer or the end user of environmental pollutants or on goods that emit pollutants (Levinson, 2007a).

Greenhouse gases (including carbon dioxide \( \text{CO}_2 \)) cause global warming. \( \text{CO}_2 \) emissions originate from diverse sources. The main sources include emissions through industry activities, power generation, transport emissions, agricultural activities, deforestation and the handling of waste. Of the categories listed, agricultural activities, deforestation and waste-related activities are the only non-energy sources. The remainder of the \( \text{CO}_2 \) emissions is caused by energy-creating endeavours. \( \text{CO}_2 \) emissions from land use (the human use of land) are as a result of deforestation (Vermeend, Ploeg & Timmer, 2008: 304).

The Kyoto agreement has achieved significant success in involving over 160 countries in employing the protocol to commit the industry decision makers to reducing \( \text{CO}_2 \) emissions and other greenhouse gases. With this treaty the various countries must achieve their individual goals through the support of their governments. But there are additional ways of achieving their goals through the use of three market-based mechanisms (UNFCCC, 2012b):
• Emissions trading
• Clean development mechanisms
• Joint implementation of the above mentioned mechanisms

By using these mechanisms the countries will encourage green investment as well as achieve their goals of reduced emissions without excessive costs being incurred (UNFCCC, 2012a).

The Kyoto agreement involves the system whereby ‘carbon credits’ are traded amongst the countries or large individual companies. One carbon credit is a permit that allows the holder to emit one metric tonne of carbon dioxide (Del Buono, 2011). Carbon credits can be traded in the international market at their current market value (climateavenue.com, 2011). The 160 countries that signed the Kyoto agreement could support their plan of action to reduce CO₂ emissions through the use of greening taxes. The collection of greening taxes might result in the creation of a double dividend. A double dividend occurs when tax revenues in turn result in other positive spin offs for example, greening taxes enforce environmentally-friendly behaviour as well as the generation of alternative fiscal revenues.

South Africa became a member of the Kyoto agreement in 2002, but as a developing country, it is not required to reduce its greenhouse gas emissions yet as it is anticipated that the enforcement of greening taxes will hamper rather than stimulate economic growth. At the time of writing this dissertation South Africa has very little greening taxes and has merely shown signs of legislating greening taxes through discussion papers for public comment made available. According to the National Treasury the development of a carbon tax policy will be created taking into account the following policies:

• Without a climate change agreement or a global emissions pricing system, only a portion of the climate change policies will be implemented as a provisional measure.
• The tax of R75 per tonne will be increased to about R200 per tonne of CO₂ in the near future in order to achieve the desired behavioural changes.
• This carbon tax will be introduced and consistently increased in order to allow taxpayers to acknowledge the new tax (National Treasury, 2010: 9).

The current South African environmental deductions or allowances in the Income Tax Act include:
"Section 12B Deductions in respect of certain machinery, plant, implements, utensils and articles used in framing or production of renewable energy

Section 37B Deductions in respect of environmental expenditure

Section 37C Deductions in respect of environmental conservation and maintenance

Section 11D Deduction for research and development costs

Section 12K Exemption for certified emission reductions

Section 12L Special allowance for energy efficiency savings"


These sections will be discussed in more depth in Chapter 5.

It is evident that the South African government is considering following international trends such as the creation of carbon markets and energy efficiency measures to address climate change as evident in the Draft Taxation Laws Amendment of 2009 (climatechangecorp.com, 2009). It consists of two incentives, the first being an incentive for entities taking part in the Clean Development Mechanism (CDM) where the company which reduces its carbon emissions will get a tax exemption for the amounts received for its reductions. The second incentive is for entities that will receive deductions from income tax for saving energy. These energy savings must be certified by the National Energy Efficiency Agency (Temkin, 2009).

In 2010 the Department of Environmental Affairs issued a National Climate Change Response Green Paper. This consisted of objectives, strategies and proposed actions in order to highlight South Africa’s contribution to combat climate change. (Department of Environmental Affairs and Tourism of the Republic of South Africa, 2010)

The main objectives of the green paper were to ensure the eradication of greenhouse gases in the atmosphere and to become accustomed to and mitigate the climate change effects that cannot be reversed in South Africa.

The following principles were appealed:

- “The principle of common but differentiated responsibility and respective capabilities” – this includes being environmentally conscious by reducing greenhouse gas emissions but also bearing in mind our ability to act with only limited resources being made available.
● “The precautionary principle” – being aware of the consequences of possible actions against climate change.
● “The Polluter Pays Principle” – the entities which pollute the environment must remain accountable for their actions.
● “A people-centred approach” – while using economic resources to mitigate climate change in the country, it is important to keep in mind social equality and the financial sturdiness of the economy.
● “Informed Participation” – social participation must be encouraged, especially the participation of the poor.
● “Inter-generational rights” – ensuring the long-term sustainability of the human race and making sure that future generations are able to enjoy the ecological resources that we leave behind (Department of Environmental Affairs and Tourism of the Republic of South Africa, 2010).

In order to achieve the climate change response objective, certain strategies have been put forth. These include, among others:

● Ensuring a well-balanced approach to the alleviation of climate change.
● Policies which have short-term mitigation to eliminate immediate threats to health and well being of South Africans.
● Using economic incentives which promote environmental awareness and dissuade indifferent behaviour towards low emissions.
● Recognising that the implementation of climate change policies in South Africa may have a wider impact on other Southern African regions (Department of Environmental Affairs and Tourism of the Republic of South Africa, 2010).

The affected sectors that will be used for climate change elimination include:

● Water – the most important resource for life on earth.
● Agriculture – the problem of shortage of food.
● Human health – threats to the health of the people is a major concern.
● Energy – renewable energy and the reduction of CO₂ emissions.
● Industry – a major contributor to CO₂ emissions in South Africa.
- Transport – makes up 8% of South Africa’s emissions.
- Disaster risk management – short-term and long-term responses to risks.
- The natural resources sectors – results in the need for adaptation responses.
- Human society – the importance of infrastructure and education (Department of Environmental Affairs and Tourism of the Republic of South Africa, 2010).

1.2 The problem

Currently, there are insufficient greening taxes in place in South Africa. Greening taxes are taxes which are intended to promote environmentally sustainable activities with the use of economic incentives. They provide a substantial tax base that has the potential to align the country’s policies with those of other countries and to ensure a sustainable environment for future generations. The consequences of the lack of sufficient greening taxes are that environmental damage is not policed and South African businesses are not monitored. The principles of King 3 could also be used to develop the environmental tax framework in South Africa. The principle of sustainability is considered an important aspect of King 3. This involves the entity considering the needs of all stakeholders involved, including employees, shareholders, customers and especially the environment. It is also suggested in the King Report that independent assurance over important aspects of sustainability reporting must be carried out (KPMG, 2009).

Environmental taxes have become a major trend worldwide and yet no policies have been put into practice in South Africa.

1.3 Countries that have implemented greening tax legislation

Certain countries have begun to impose environmental taxes. These frameworks have been developed by the International Energy Agency (IEA), the Organisation for Economic Cooperation and Development (OECD) and the European Commission (Vermeend et al., 2008:316). According to the OECD, the highest revenues from environmental taxes consist of the taxes derived from automotive fuels and taxes on light fuel oils. South Africa, although not part of the OECD still adheres to the set of rules of the OECD (OECD, n.d.).
For the past ten years, European countries have been using and improving their green tax mechanisms more and more. Other forms of tax bases include tax on plastic bags, landfill waste, batteries, sulphur dioxide and greenhouse gas emissions that are not energy related. These taxes are just as effective as energy-related taxes. The European countries’ experience with these taxes has allowed them to increase their effectiveness and eliminate exemptions with the use of increased taxes. It would be plausible to expect that the countries that have been implementing environmental taxes have managed to reduce CO₂ emissions and the consumption of natural resources (Milne, 2007).

Lately, more pressure has been placed on the energy-intensive industries to create more environmental consciousness with their activities (Kohlin & Sterner, 2003) Green Taxes involve both negative and positive incentive schemes. The negative schemes involve the discouraging of polluting activities, while the positive incentive schemes encourage environmentally friendly behaviour. The ‘negative’ incentives include: taxes on energy products, motor vehicles, waste and natural resources amongst others. Positive incentives include carbon credits (Vermeend et al., 2008:316).

With the introduction of new taxes, comes the generation of new revenues. This results in governments being given the choice of where to allocate the new revenues generated. Certain greening taxes in Europe have implemented a revenue-neutral stance also referred to as the double dividend. The government allocates these funds to provide economic relief from other tax liabilities which slow down economic activity such as income taxes and taxes on labour as opposed to allocating the revenues to the general fund. Austria, Denmark, Finland, Germany, the Netherlands, Sweden and the United Kingdom have formally implemented environmental tax reforms (Milne, 2007).

The Nordic countries as well as the Netherlands have the highest tax liability per capita. Over 90% of environmental tax revenue is collected from energy and automotive taxes. Some of the taxes include: duty on raw materials, chlorinated solvents, disposable tableware, tyres, excise duty on antibiotics and growth promoters among many others (Vermeend et al., 2008:316). The Netherlands is situated high on the list of environmental tax revenues. The government created an incentive to alter the environmental behaviour and to maintain an economy that has low emissions. (The Netherlands has the highest environmental taxes in the world, 2010) As a result of the high density of population and industries, there has been an
increase in the imbalance of the country’s environment. Concerns have been raised over the geographical balance between land and water. For the past 20 years the Netherlands has made adequate progress in achieving many of its environmental objectives. Its most important environmental policies include: climate change, over-exploitation of natural resources, threats to human health and the quality of life (OECD, 2006).

The Scandinavian countries (Finland, Sweden, Denmark and Norway) along with the Netherlands have all been imposing carbon taxes for at least ten years (Mann, 2002). These countries reduce a combination of personal income tax, social security contributions, corporate tax and capital tax by the amount of the revenue raised by the carbon tax.

These Scandinavian countries have conducted studies on the effectiveness of the implementation of environmental tax policies and have concluded that the implementation has been successful with regards to the reduction of CO₂ emissions. From 1987 (being the initial implementation) to 1994 Sweden had a 19% reduction in their CO₂ emission rate from the heating, industrial and housing sectors. In Norway there was a 21% decrease in CO₂ emissions from stationary combustion plants. In Finland, carbon emissions would have been 7% higher had carbon taxes not been implemented (Mann, 2002).

The United States has followed a different approach. In recent years, environmental tax policies in the United States have focused on creating tax credits and tax deductions for endeavours that have environmentally positive effects, rather than using negative approaches for environmentally harmful activities. The Energy Policy Act of 2005 relied heavily on tax incentives to carry out federal policies. Certain tax policies came about, including an income tax deduction for energy-saving lighting in commercial buildings and an income tax credit for alternative-fuel vehicles that were economical to run (Milne, 2007).

1.4 Countries’ greening tax models that will be examined

The United Kingdom and United States of America have been chosen.

1.) The United Kingdom has been chosen as its green tax landscape has been constantly changing with new measures being introduced and existing measures being amended. One must also take into account that the United Kingdom has implemented environmental policies for a longer time period than most other countries and it is very progressive.
2.) The United States has been chosen as it differs from other countries and provides a
different perspective on greening taxes.

### 1.4.1 United Kingdom

The UK has been involved with the eradication of environmentally unfriendly behaviour for
decades. The ‘Keep Britain Tidy’ campaign has been in place for over 50 years. However, the
implementation of greening taxes having an impact on the attitude towards environmental
responsibility is a new endeavour. The first environmental tax was introduced in 1996, and
subsequent tax laws have been implemented in the UK with new legislation being introduced
as well as amendments to the current legislation. The taxes that do not include environmental
aspects have also been made more ‘green’ in order to create a consistent atmosphere of
environmental responsibility. The Office for National Statistics reports on a regular basis on
the different types of environmental taxes collected in the UK. The following list of taxes
makes up most of environmental taxes collected (Devenney & Parkes, 2009):

- Fuel duty
- Vehicle excise duty
- Air passenger duty
- Landfill tax
- Climate change levy and
- Aggregates levy.

The UK holds a larger portion of tax revenue and a larger portion of GDP in environmental
measures than the OECD averages (Leicester, 2006).

Yet, according to Devenney and Parkes, environmental tax revenues are predicted to continue
escalating, but the percentage of environmental taxes compared to the UK’s total tax
revenues has followed a decreasing trend since 1999. An examination of the environmental
tax frameworks may provide reasons for this. This will be dealt with in chapter 3.
1.4.2 United States

Studies have shown that the broader US economy will benefit from greenhouse gas mitigation. However, certain industries within the US which happen to be the largest polluters and which also receive one of the highest tax subsidies, resist this notion as they fear that this will reduce their competitiveness (Mann, 2002).

The OECD believes that exemptions and rebates will be problematic as the energy-intensive sectors which are given special treatment tend to be the largest polluters and have a substantial negative environmental impact. In one study it was found that exempting high emitting industries would increase the total cost of greenhouse gas emission reduction by 20% and therefore the other industries would have to compensate for the difference by being taxed excessively (Mann, 2002).

Exemptions for the large polluters seem to result in a decrease in investment in research and development of environmentally friendly alternatives. The US takes the smallest share of both total revenues and GDP in environmental taxes (Leicester, 2006).

The United States imposes very few green taxes. Only those countries that have ratified the Kyoto Protocol are bound by its terms; therefore, although the United States has signed the Protocol, it is not forced to recognise its terms, since it has not ratified it (Kyoto Protocol and the United States, 2006).

However, there are standards in place to reduce pollution such as the Clean Air Act’s New Source Performance Standards (NSPS) for stationary polluters and the Corporate Average Fuel Economy (CAFE) standards for automobiles. Other green taxes in the United States include tax on new cars that surpass fuel-efficiency guidelines, a tax on ozone-depleting substances and miscellaneous taxes on fertilizers and pesticides used in agriculture (Levinson, 2007b). The Internal Revenue Service has imposed environmental taxes on crude oil and petroleum products (oil spill liability); the sale or use of ozone-depleting chemicals (ODCs); and imported products containing or manufactured with ODCs (Internal Revenue Services United States Department of the Treasury, n.d.).

The United States has a number of laws that address greenhouse gas emissions, but it does not have a comprehensive legal system for reducing its contribution to the world’s carbon dioxide or other greenhouse gases. Although the Environmental Protection Agency (EPA)
has requested thoughts on the ways in which it might use its authority under the Clean Air Act to regulate greenhouse gases, the EPA considers the Clean Air Act as ill-suited for the task of combating the world’s CO₂ emissions (Milne, 2008).

An in-depth programme would probably need centralised legislation to be put into place, and a number of proposals are pending in Congress, including carbon tax bills and the popular cap-and-trade bills. An in-depth analysis of the progress of the tax bills will be made in this study and will be covered in chapter 4.

1.5 Research objective

The aim of this study is to investigate international greening or environmental taxes by examining countries with established environmental tax frameworks in order to provide a basis for the development of green tax legislation in South Africa. The countries that will be examined include the United Kingdom and United States of America as they are among the world’s superpowers. The developing countries have not been chosen in this dissertation as this is an investigation of the proposed and implemented policies in the United States of America and the United Kingdom and the success thereof in order to determine whether or not these policies or practices could be applicable in South Africa.

The objectives include:

- To provide evidence of workable models and to research contemporary Western trends of greening tax models.
- To determine what greening taxes have been proposed or implemented in the United States and the United Kingdom and whether or not they have been successful.
- To provide guidelines for a greening tax model for South Africa that distinguishes which aspects of international tax models have been successful in controlling carbon emissions.

1.6 Research methodology

An interpretative research approach will be used for the present research as it seeks to understand and describe environmental taxes. The research methodology to be applied is
considered to be doctrinal research methodology. This methodology provides a systematic exposition of the laws governing a certain legal category, analyses the relationships between the laws and is based entirely on documentary data (Babbie & Mouton: 2009). The documentary data to be used for the research include:

- Legislation (the tax legislation of the United States of America, United Kingdom and South Africa);
- South African Revenue Service Acts (the Income Tax Act 58 of 1962 and the Customs and Excise Act 91 of 1964);
- Articles in accredited journals; and
- Textbooks and other writings.

1.7 Problems and limitations

As this is a relatively new issue, and as South Africa has not implemented any greening taxes, it will be necessary to gain insight into practices currently existing in other countries. There is a scarcity of greening taxation books in South African universities and the difficulty of obtaining these books is a limitation. The Scandinavian countries will not be covered in this minor dissertation as the language is a limitation and most journals and articles on these countries have not been translated into English.

1.8 Benefits of the study

This critical investigation makes a contribution to the study of the role taxation may play in contributing to a safer environment as a secondary spin-off to a revenue resource area not already tapped. Thus this research contributes to scholarship in an important and insufficiently explored area of taxation.

1.9 Broad plan

In chapter 2, the history, development and need for greening taxes will be discussed, as well as references to the numerous countries that have implemented it.
Chapter 3 will cover a study of the United Kingdom environmental framework and its development.

Chapter 4 will contain a detailed review of the distinguishable United States incentive tax structure.

Chapter 5 will highlight the South African environmental tax acts in existence.

Chapter 6 will compare the three countries and highlight the similarities as well as the differences among the selected countries’ greening tax models. This will be followed by a recommendation for policies or models to use in South Africa as well as a conclusion to the study.
Chapter 2

Literature review

2.1 Introduction

Taxes can be very effective instruments in order to mitigate emissions and protect the environment. It will become apparent in this chapter that greening taxes have the ability to change the tax system significantly by generating large sums of money that could be used to fund large cuts in other taxes as well as funding green expenditure. Many countries have implemented some sort of levy system or tax framework principally designed to counter carbon emissions in the country. It seems that in countries where the state offers full and consistent support towards the implementation of these policies, levy systems are most effective.

2.2 The BRICS

The BRIC countries, the leaders of Brazil, Russia, India and China have met annually since 2009 to discuss issues of global significance such as development, peace and security, energy and climate change, and social issues. During the group’s third summit in 2011, the leaders invited South Africa to join the group, thereby becoming BRICS (BBC, 2009).

2.3 China

An example of a country which neglects the implementation of environmental climate change policies is the People’s Republic of China. Hu Jintao, president of the People’s Republic of China, was reported to have said at a United Nations climate summit in New York (BBC, 2009) that China will increase efforts to improve energy efficiency and curb the rise in carbon dioxide emissions, but it seems unlikely that the country will deliver on this pledge. Just before the start of the 17th Conference of the Parties (COP17), the annual climate change
summit of the United Nations Framework Convention on Climate Change held in Durban, South Africa, from 28 November to 9 December 2011, Vice-Premier of China, Li Keqiang, delivered a disconcerting message about the country’s climate concerns. He stated that although energy conservation and environmental protection is a long-term strategy for China, it is still only an option. China is the world’s top producer of carbon dioxide, by default the largest contributor to climate change according to the ranking from risk management consultancy Maplecroft in March 2012 (Reuters, 2012). It emits approximately 6,018 million tonnes of greenhouse gases per year. It does not seem as if the status will change any time soon because the Chinese government is part of the problem rather than part of the solution (Mourdoukoutas, 2011).

China has developed a comprehensive environmental strategy similar to that of the United States of America and was the host of the 2010 United Nations’ conference on climate change. The difference between the two countries is that polluters in the United States of America are private companies and polluters in China are government-owned companies. This means that the government as owner and administrator of those enterprises is part of the essential problem. State-owned enterprises and Town Village Enterprises are further units of the state instead of true enterprises and provide employment for unionised workers and financial support for local schools and hospitals. Precisely this makes any government action against these corporations too costly for the communities they are affiliated with. The country’s one party system places all three official powers in the hands of the same group and turns the government into both a regulator and the regulated. This conflicting role of the government makes it difficult for a polluter to be responsible for his or her own actions in the first place, afforded a just and fair trial in the second and sanctioned in the third place. China has its own version of climate strategy. It has targets and priorities, but it lacks an execution mechanism (OECD, 1999).

The country set targets in the 1970’s to achieve within 30 years towards reducing the impact of pollution on the environment. A Pollution Levy System (PLS) was put in place in 1979 and is supposed to be revised and altered on a continuous basis. The principle of the ‘Polluter Pays’ has been in place in China for many years, but is decentralised. This implies that the monitoring of the system is left in the hands of the provincial officials who are accountable for the manufacturing of goods and is not controlled by the state. Therefore there is very little hope for an effective, standardised framework of environmental taxes. In addition to this, the
Chinese environment is under tremendous pressure as a result of the country’s rapid development. The air and groundwater quality is now far below acceptable levels for sustaining life. Wind and water erosion, deforestation and desertification have reached critical levels in many areas of the country (Bohm, Ge, Russell, Wang & Yang, 1998).

Although China has had the PLS framework for many years and is continually amending and adding to it, its diverse geographical and cultural landscape is a significant hindrance to its development. This situation is also evident in South Africa and may pose a major problem if a standard environmental tax framework were to be put in place (Bohm et al., 1998).

2.4 The correlation between emissions and taxes

The graph below shows that the higher the tax charged on emissions, the less the emissions will be. This is because people are not prepared to pay more taxes as a result of excessive production and therefore will be more inclined to consider their environmental footprint and reduce emissions where possible.

![Graph showing the correlation between emissions and taxes.](image)

**Figure 2.1 Economics of Emission taxes**

*Source: Bohm et al., 1998*

The emissions are measured on the horizontal axis and the costs per unit as well as the benefits derived and taxes on the vertical axis. The curved line (MCA) is the Marginal Cost
of the Abatement for a single pollutant; the straight line (MBA) is the Marginal Benefit of the Abatement. The reason for the upward slope is because the damage from every unit of pollution increases when the emissions increase. This graph shows that the more the taxes increase \((t^*)\) the more the emissions decrease \((e^*)\). This is an indication that manufacturers and producers are not inclined to pay more taxes and would rather decrease their excessive production than pay higher taxes. The most appropriate level of emissions is where the MCA and MBA lines meet. This is the level where the most beneficial level of emissions and taxes exists. To achieve this appropriate level of \(e^*\), the tax rate imposed should be equal to \(t^*\). This would generate revenues equal to \(t^* e^*\). (This is represented in the shaded area in the figure).

With the decrease in taxes \((t')\) comes the increase in emissions \((e')\). This means that manufacturers and producers will increase their production, thereby increasing their emissions if the taxes levied on emissions had to decrease (Bohm et al., 1998).

The United States as well as the United Kingdom have been selected for this study. These are first world countries which, among other attributions, are expected to have solid environmental policies in place. Other countries were considered but the availability of adequate information was a challenge.

2.5 The United States of America

The United States has been chosen for this study as it is the powerhouse economy of the world. With its massive economy, the United States of America is the second biggest polluter in the world. It is therefore fitting to consider the measures the US has put in place in order to address the excessive amounts of CO\(_2\) which are being emitted. The Obama administration has been attending to some heavy burdens which it inherited from the previous administration. The US has been facing an economic crisis, a war and more pressure internationally to play its part in addressing climate change. The previous administration under the Bush regime did not implement the climate change policies set forth by policymakers (Reuters, 2012). The policies were considered too expensive and time-consuming. As a result, more CO\(_2\) has been emitted and less time has been spent on developing alternative energy sources.

The motivation for covering the US was to highlight the proposals made even though few of them materialised. Perhaps this was an attempt by the US to be seen as environmentally conscious by proposing many policies and not committing to them.
Climate change is one of the biggest challenges which the present generation faces. If it is not addressed soon, it will exponentially worsen and eventually reach the stage where very little will be able to be done to address the situation. The US is a trendsetter resulting in many other countries following suit. A good example is the current economic crisis. When the US property market collapsed it sparked a worldwide economic recession with a knock-on effect, especially in Europe. If a climate change policy were followed by the United States, a good example will be set for the rest of the world. This will perhaps entice other superpowers (e.g. China the world’s biggest polluter) to implement and follow a climate change strategy. The United States is the second largest emitter of greenhouse gases in the world with 5,903 million tonnes of greenhouse gases being released every year (Reuters, 2012).

In the United States, while the Bush administration was in place, taxes were reduced and this had a detrimental effect on environmental regulations. This also had an inflationary effect on the deficit which was difficult to face as a result of weak government. The approach where reduced government spending as well as a reduction in taxation is endorsed is known as the ‘Tea Party Approach’. If the government itself is not entirely committed to addressing the environmental issues that the world currently faces, it would be very difficult to set a standard for the population who would be willing to partake in environmental preservation (Pope, 2011).

An exceptional amount of money is spent on the United States military budget. Only one eighth of this budget is needed for restoring the environment. This raises questions as to why nothing is being done. Saving the environment is not a spectator sport and one should consider that the choices made by this generation will affect life on earth for all generations to come (Brown, 2011).

It is important to note that environmental taxes are essentially different from traditional taxes as they are not merely designed to raise revenues. The reason for creating environmental taxes is to execute a tax system which stimulates ecological and economic awareness in individuals as well as corporations. With the use of taxes, the patterns of behaviour of individuals and corporations are able to be changed in order to take into account key environmental issues.

By imposing environmental taxes, the concept of the double dividend arises. The ‘double dividend’ results in the improvement of the environmental system as well as the generation of
revenue from these taxes which could be used to address environmental as well as employment concerns (Backhaus, 1998).

An effective environmental tax framework thus involves an income tax exemption on personal or corporate taxes where the environment is improved or sustained by way of an effective scheme. It is beneficial as it sustains the environment and generates revenue for the government (Backhaus, 1998).

The government of the United States offers tax incentives for individuals who invest in green technologies. Individuals considering the replacement of old appliances or converting home systems into more energy-efficient units have a window of opportunity until 2016 to qualify for a 30% federal tax credit, depending on the state the individual resides in. Most states offer tax refunds: 21 states offer income tax credits for renewable energy projects and 17 states have tax incentives for energy-efficient purchases from sales tax relief to income and property tax-breaks (Andersen, 2008).

2.6 The United Kingdom

The United Kingdom is committed to the Kyoto Protocol. The Protocol was adopted in Kyoto, Japan on 11 December 1997 and was officially implemented on 16 February 2005. The Kyoto Protocol is an agreement based on the United Nations Framework Convention on Climate Change. This is an international agreement among 37 developed countries and members of the European Union where obligatory targets are set to reduce their greenhouse gas emissions. The targets have been set to reduce by 5% between 2008 and 2012. It is important to note the difference between the Kyoto Convention and the Kyoto Protocol. The Convention suggests the reduction of greenhouse gases whereas the Protocol commits the countries to these reductions (UNFCCC, 2012b).

The UK met its emission reduction targets as early as 1999. Most of the tax revenues that are generated every year relate to fuel duties. According to the OECD, the UK is higher than the OECD averages in collecting its GDP revenues from environmental taxes. The UK has shown more commitment to reducing CO₂ emissions even though its economy is much smaller than the US economy. Britain has always been conscious of its environmental footprint. From as early as the 1950s it supported the ‘Keep Britain Tidy’ campaign. The
environmental tax revenue of the UK is generated mostly from transport taxes, taxes on waste and natural resources and energy taxes (Leicester, 2006).

Although the UK met its emission reduction targets very early, statistics have shown that the revenue generated from environmental taxes has decreased slightly over the years (Leicester, 2006). The main reason for this decline is as a result of waiving the fuel duty escalator which ensured more taxes would be collected as fuel duties every year.

It is apparent that the UK has decided to move away from the conventional environmental taxing systems and making use of tradable permits, i.e. carbon credits.

It is important to note that most of the environmentally related tax revenues came from households and after that, the transport and communication sector. This is an indication that the industrial sector has not had much of a tax burden from their endeavours. This is because there are very few industrial plants in the United Kingdom.

2.7 Scandinavian countries and the Netherlands

Amongst the OECD member countries, the Scandinavian countries take the highest portion of GDP through the use of environmental taxes. As far back as 1931 Norway introduced petrol taxes. The first direct environmental tax was introduced on sulphur in Norway in 1971. Only in the 1980s did the taxes come into force. This is still very early compared to the other OECD member countries. The Scandinavian countries have consistently been trying to reduce emissions which could harm air and water as well as consciously making an effort to reduce any waste generation. The use of tax instruments has become favourable in reducing the emissions caused by production and consumption. Levy systems are most effective in these regions. There have also been developments of new forms of environmental taxes in Norway recently. There was an implementation of an environmental tax on beverage packaging in 1994, as well as a tax on final waste disposal in 2000 (Jagers & Hammar, 2009).

Sweden imposed a carbon tax on fuels in 1991. It was introduced slowly to the citizens. At first it was not well received but gradually it became a standard charge on fuel. The population of Sweden is generally more tolerant to environmental taxes. Sweden has one of the highest income taxes in the world and the population of Sweden is an environmentally conscious population (Jagers & Hammar, 2009).
In 1995 Denmark was successful in introducing a pesticide tax. This was aimed at taxing only the farmers. Although farmers are not responsible for all CO$_2$ emissions, it was an effective way to tax the producers directly. The Netherlands has one of the world’s highest Gross Domestic Product and has experienced massive growth in its economy over the last ten years. Annually, over 27 billion Euros are paid in taxes by citizens and companies. According to the OECD, the Netherlands is at the top of the list regarding environmental taxes. The reason for this success is as a result of the government’s incentive to change behaviour and to create a low-carbon economy amidst a recession. Better use could be made of environmental taxes in order to discourage polluting activities and boost green technologies (The Netherlands has the highest environmental taxes in the world, 2010). As there is a high density of population, a thriving economy and a limited area of land, there is no doubt that there is a lot of pressure being placed on the country’s environment. This has created concern about how the balance between land and water can be maintained (OECD, 2006).

For the past 20 years, the Netherlands has made much advancement in meeting many of its environmental goals. The priority environmental issues in the Netherlands include: climate change, over-usage of natural resources, threats to human health and damage to the quality of life (OECD, 2006). As a result, extensive frameworks have been developed over the past ten years to implement greening taxes effectively in the Netherlands.

2.8 COP 17

In November 2011, South Africa hosted the COP17 convention. The outcomes of the international negotiations under the United Nations Framework Convention on Climate Change (COP17) and the Kyoto Protocol included the following decisions amongst others:

- The decision to increase the transparency of developing countries’ national mitigation actions.
- The decision to review and assess the developed countries’ domestic emission reduction targets and commitments.
- Preservation of a combined rules based system underpinning the mitigation regime by agreeing on a second commitment period.
• Development of emission reduction targets for countries not part of the Kyoto Agreement.
• Full implementation of international mechanisms to enable and support alleviation and adaptation efforts in developing countries.
• Executing the outcomes that were successfully negotiated in Cancun last year in terms of a finance agreement on the detailed design of the Green Climate Fund steered by Trevor Manuel. The design includes mechanisms for bringing private sector and market structures into play so as to increase potential flow of subsidies into climate change responses.
• Launching a selection process for the host of the Climate Technology Centre (Molewa, 2011).

2.9 South Africa

The South African government has proposed environmental tax incentives to try address the negative effects of climate change. The country’s greenhouse gas emissions are among the world’s top 20 and accounts for 42% of Africa’s emissions and 1.8% of the world’s emissions. The Draft Taxation Laws Amendment Act of 2009 introduced two incentives in support of sustainability objectives for the environment: firstly, an income tax incentive for any business that is involved in a clean development mechanism (hereafter CDM). It applies to the disposal of carbon emission reductions and the disposal of such carbon reductions will be exempted from income tax. However, there has been a limited uptake of cleaning development mechanisms projects in South Africa, attributed largely to financial difficulties. Secondly, the Draft Taxation Laws Amendment Act proposes that businesses will be able to obtain deductions from income tax for energy saving provided that there is documentary proof of the resulting energy efficiencies endorsed by the Energy Efficiency Agency (Temkin, 2009).

South Africa is a resource intense country where there is a great reliance on mining, agriculture and manufacturing to make up a significant part of the GDP. These sectors employ a large portion of the workforce and consume an excessive amount of electricity and coal to produce fuel. Even though it is a developing country, the electricity consumption and
carbon dioxide emissions are in line with those of upper-middle-income and high income countries (South Africa, 2010).

With the high rates of unemployment, there is a possibility of achieving a double dividend in order to create economic and environmental goals. It seems that this is achievable with the following objectives: environmental taxes could significantly reduce pollution at very little or no costs as well as causing a set-off of other taxes such as income taxes. The achievement of a double dividend in South Africa is largely dependent on the inefficiencies in the South African Tax system and how environmental taxes can influence the transformation of the tax system (South Africa, 2010).

The South African government considers climate change as one of the greatest threats to sustainable development and that climate change (if left unmitigated) has the potential to undo or destabilise many advances made in meeting South Africa’s own growth objectives. The economy is vulnerable to the impacts of climate change as a result of its reliance on fossil fuels as a chief source of energy generation. The government also acknowledges that the stabilisation of greenhouse gas concentrations in the atmosphere will require the international implementation of an effective and binding global agreement on greenhouse gas emission reductions; that there will be financial implications to the country’s greenhouse gas emission reduction efforts; there will be considerable short and long-term social and economic benefits; and that the costs will be less than the costs of delay and inaction (South Africa, 2010).

2.10 The need for environmental taxes

Carbon emissions accounts for almost all of the impacts of man-made greenhouse gas emissions (Department of Energy & Climate Change (DECC) 2012b)

Environmental taxation can be used to modify behaviour in ways that the lawmakers believe is desirable. It has been found that by imposing taxes, governments can protect the environment by effectively attending to the pollution (Institute for Fiscal Studies, 2011).

Tax is the most important economic instrument at a government’s disposal that can be used to alter mass taxpayer behaviour. It is believed that the introduction of environmental taxes can potentially revolutionise the tax system through the raising of money that could be used to
fund reductions in other forms of taxes. In designing an environmental tax system it is important to avoid unintended or undesirable effects on the taxpayer’s decisions regarding the amount and manner in which to work, save, invest and spend. The rationale for environmental taxes is simply that pollution compels society to bear the costs of the initial polluter, thereby shifting responsibility. Enforcing taxes will result in the polluter acknowledging the broader costs when determining how much to pollute. For this reason, it is a reasonable goal to decrease emissions to levels that encompass the costs as well as the benefits of the polluting endeavour. This is where the dynamics of figure 2.1 come into play. The government can mediate an acceptable level of pollution through anticipating the behaviour of the polluter (refer to fig 2.1.).

When polluters merely take into account the cost of their own endeavours and disregard the social impact, they will pollute more than is socially acceptable. Taxes affect the prices paid by polluters resulting in the polluters becoming more environmentally conscious. If the taxes create an adjustment in their business practice, it will lessen the emissions more effectively if the adjustments are cheaper to implement. This is more efficient than forcing the entities to incur excessive costs to reduce emissions. The Green Fiscal Commission expects a greater role for greening taxes but not to the extent that it will entirely alter the make-up of the tax system because taxes alone are not sufficient to reform a society without complimentary policies. Ideally, one would want to increase the tax on emissions and pollution until the marginal cost to the firm is the same as the marginal environmental advantage that the tax reduction creates. However, it will still not reduce pollution to the point of non-existence because the costs of tax reduction cannot compare with the benefits of the polluting activity where the end product of the polluting activity is very valuable e.g. coal mining (Institute for Fiscal Studies, 2011).

As stated in Bohm, Ge, Russel, Wang & Yang (1998) the optimal level of emissions is where the marginal costs of the abatement equals marginal benefits of the abatement. This is where social costs of the pollution are minimised. The reality is that policymakers do not have the information to achieve the optimal environmental tax solution as it is easy to set either too high or low tax objectives and consequently, badly designed or excessive tax systems can be damaging to the economy.

Fullerton, Leicester and Smith contend that the key to successful environmental tax execution does not lie simply in introducing taxes with an elusive rationalisation for utilising
environmental taxes. As a matter of fact, the solution lies in the alignment of environmental concerns with appropriate economic instruments (Fullerton, Leicester & Smith, 2008).

The contribution of badly formulated environmental tax systems will result in further unnecessary taxation charges, simultaneously offering very few marginal environmental benefits. It is an undertaking of grand proportions to formulate different tax objectives as well as the instruments to measure this, as information requirements are quite extensive which, in turn, limits the applicability of the tax instrument. Emissions are not measured or traded as they are a by-product of the production process and therefore special cost-intensive mechanisms will need to be developed and implemented to facilitate the taxation process. Another form of environmental tax would be the taxation of measurable market transactions directly related to pollution, such as taxation on goods that are part of the pollution process e.g. batteries, fuels and fertilizers. These taxes may be more economical but they are not directed to the main polluting activities resulting in unintended and unproductive responses on behalf of the polluters e.g. cheaper batteries and polystyrene cups which are detrimental to the environment (Fullerton et al., 2008).

2.11 History and development of greening taxes

The European Commission started its environmental policies with an inconceivable programme. This contained the elementary ideas of sustainable development initiatives that are still present today.

The first Environmental Action Programme was determined in November 1973. This programme already established the argument that economic growth, prosperity and the safekeeping of the environment are mutually interdependent. It was stated that “the protection of the environment belongs to the essential tasks of the community”. Among the most important objectives were:

- the prevention, reduction and containment of environmental damage
- the conservation of an ecological equilibrium
- the rational use of natural resources

(EEB, 2005).
It can therefore be concluded that these objectives were the foundations of the current policies that have been put into practice.

The main reasons for using environmental taxes are:

- They are very effective instruments for the internalisation of external factors, i.e., the incorporation of the costs of environmental services and damages are directly factored into the prices of the goods, services or activities which cause them. This contributes to the implementation of the principle that what the polluter pays is aligned to economic and environmental policies;

- They can provide incentives for both consumers and producers to change their outlook towards a more 'eco-efficient' use of resources. This will stimulate innovation and reinforce compliance with regulations;

- They can raise revenue which may be used to improve environmental expenditures and reduce taxes on labour.

- They can be very effective policy tools to undertake current environmental priorities from pollution sources such as transport emissions (including air and maritime transport), waste (e.g. packaging, batteries) and chemicals used in agriculture (e.g. pesticides and fertilisers) (European Environment Agency, 1996).

Most environmental taxes generate very little revenue. This is a result of the tax bases being relatively small, making it difficult to raise much revenue from taxes even though the resulting incentives can be quite beneficial from an environmental point of view. In other cases, tax rates can be quite low. It is important to note that additional revenues from carbon taxes and from the selling of permits may increase the role of environmentally related taxation in government budgets (OECD, 2010).

In addition to promoting the adoption of pollution abatement measures, environmentally related taxes can provide considerable incentives for innovation, as firms and consumers seek new, cleaner solutions in response to the price put on pollution. These incentives also make it
commercially attractive to invest in research and development activities to enhance technologies and consumer products with a lighter environmental footprint (OECD, 2010).

Environmental taxes can be split into three categories, according to their goals:

- Cost-covering charges – used to incur the costs relating to environmental facilities such as water purification (user charges) and which can be used for similar environmental costs (earmarked charges);
- Incentive taxes – these are used to influence the actions of consumers and producers; and;
- Fiscal environmental taxes – used principally to generate revenues.

A combination of these three categories can be used in practice. (European Environment Agency, 2006).

The advancement of environmental taxes has developed from expenditure charges in the 60s and 70s to a mixture of incentive and economic taxes in the 80s and 90s and more recently into environmental and ‘green’ movements where taxes on the ‘bads’ will be used to set off taxes on the ‘goods’ such as labour taxes (European Environment Agency, 1996).

The current trends involving greening taxes (split into taxes on energy and other environmental taxes) can be summarised as follows:

- Environmental taxes (non-energy taxes according to the European Commission classification of DGXXI), represented only 1.5% of total EU taxes in 1993; in only a few countries do environmental taxes represent a larger ratio (Netherlands 5.1%; Denmark 4%); taxes classified as energy taxes represented a larger proportion (5.2% for the EU on average) and up to around 10% in Portugal and Greece and 6-7% for Italy and the UK). Several countries are currently implementing environmental taxes in 'green tax reforms', using the new tax revenues to reduce other taxes, such as labour taxes.
- Environmental taxes have normally been introduced without revenue generation where taxes have been concentrated on pollution and taxes on labour have been reduced. Generally, most governments that have implemented environmental tax reforms have cut the tax on labour in order to diminish unemployment. This tax
shifting is known as the “double dividend” where the environment has benefitted and
the second (employment) dividend occurs as a result of reduction in labour taxation
(OECD, 2000).

Collecting tax on domestic energy might result in the creation of a double dividend, which is
the inflow of revenue to the government from the taxation of a polluting entity while
simultaneously resulting in the preservation of the environment as a measure of behaviour
correction. For example, taxes on carbon emissions of a coal mine will result in more
revenues being generated for the government and more awareness and environmental
consciousness on behalf of the polluter when implementing its policies. Certain countries
have implemented revenue recycling programmes. This involves using revenue from the sale
of emission units to reduce other taxes that create economic distortions (New Zealand
Ministry for the Environment, n.d.).

It is interesting to note that certain countries have different policies with regards to
implementing revenue recycling programmes. This is where the sale of emission units are
used to reduce other taxes that create economic imbalances. Sweden and Finland have mainly
recycled revenue by lowering income taxes. In Sweden, one of the major policies is to lower
the pressure of income taxation on labour income. The tax policies in these countries involve
reducing direct income taxes. The use of environmentally related taxes has helped in
generating substitute revenues for most income tax reductions. Alternatively, Denmark and
the U.K. have been using these revenues to reduce employers’ social security contributions in
order to attend to inflationary consequences. Denmark and the U.K. have alleviated the
imbalance with the use of the various instruments for energy-intensive industries such as
agreements and reduced rates for heavy industries.

The Netherlands and Germany have implemented combined approaches. At first the Dutch
reduced the tax on income for the benefit of the public. This resulted in complicated formulae
for the exemption of electricity and gas consumption. In the following phase, the Dutch
decreased the employers’ wage component and corporate taxes. In Germany, the
environmental tax policies split the revenue recycling equally between the reductions of
employers as well as employees’ social security contributions (Andersen, 2008).
This restructuring takes into account the eco-tax reform aimed equally at gasoline prices and other fuels. (Refer to Figure 2.2 below for the price effect of revenue recycling in Germany) (Andersen, 2008).

![Price Effects in Germany](image)

Figure 2.2 Price Effects in Germany

Source: Andersen, 2008

### 2.12 Conclusion

It is evident from the content of this chapter that environmental taxes are very effective revenue generators. All this revenue is put to good use by funding cuts in other taxes as well as subsidising environmental expenditure. It can be seen that in countries where the government has a hands-on approach regarding the implementation of levy systems or tax frameworks, these systems are the most effective.

The United Kingdom will be investigated in more detail in the next chapter.
Chapter 3
The United Kingdom

3.1 Introduction

The United Kingdom has been encouraging environmentally conscious behaviour for many years. The first environmental policy in the United Kingdom was the Smoke Nuisance Abatement Act in 1853. This act introduced a few regulations in order to reduce air pollution by creating smoke control areas where only smokeless fuels could be used. In addition to this act, measures were introduced to relocate power stations away from populated areas and certain chimneys heights were increased. As far back as the 1950s Britain has been involved in attempting to keep the country environmentally friendly. The Keep Britain Tidy movement was an anti-litter campaign which was implemented in 1955 and is still in operation today (Devenney & Parkes 2009). Despite these attempts, by 1989, energy consumption in the United Kingdom had increased sharply to the equivalent of over 146 million tonnes of oil per year (Department of Energy & Climate Change (DECC) 2012a, Table 1.4). This was possibly as a result of increases in demand for electricity among other energy sources.

3.2 Fossil fuel levy

In 1990 the United Kingdom (referred to as UK from here onwards) introduced a Fossil Fuel Levy (FFL) which was charged on the purchasing of electricity (Devenney & Parkes 2009). At first, the revenues generated from the FFL were used to fund nuclear power and a very small amount was allocated to subsidise alternative energy. However, in 1998 the revenues generated from the FFL were used to contribute exclusively to funding the development of alternative energy sources (Milne 2008, p.53). Shortly after the introduction of the FFL, environmental taxes were introduced.

3.3 Environmental taxes

Environmental taxes were formally introduced in 1996 and there have been many changes to the environmental tax frameworks since. The non-environmental taxes have also been adjusted in order to become more environmentally orientated (Devenney & Parkes 2009).
The UK signed the Kyoto Protocol in 1997. The protocol required the European Union countries to reduce their emissions by 8% from 1990 up to 2012. The UK went further and set its targets to reduce its emissions by 12.5%. With the formation of the ‘Climate Change Programme’ the UK set its own target to reduce its emissions by up to 20% by 2010 (ed. Payne 2006, p. 15).

The UK has introduced three new environmental taxes in recent years, namely, Landfill Tax (1996), Industrial Energy Tax (2001) and Aggregates Levies (2002). There are also an Air Passenger Duty which was introduced in 1993 and a Vehicle Congestion Charge which was introduced in 2003 (Adam, Besley & Mirrlees 2010).

According to HM Treasury, environmental tax revenues from various sectors amounted to £42.2 billion for the year 2011. This was about 7% of the total tax revenue for 2011. It consisted of: Fuel Duties £31.5 billion, Vehicle Excise Duty £6 billion, Air Passenger Duty £2.6 billion, Landfill Tax £1.1 billion, Climate Change Levy £0.7 billion and Aggregates Levy £0.3 billion. Total tax revenue for 2011 was £588 billion (Her Majesty’s Treasury (HM Treasury) 2010, table C11).

The following significant environmental taxes in the UK will be discussed in detail below:

- Fuel and motor taxes
- Air Passenger Duty (APD)
- Landfill tax
- Aggregates levy
- and the Climate Change Levy (CCL).

### 3.3.1 Fuel and motor taxes

As mentioned above, fuel related taxes make up most of the collections of revenue. These are the oldest form of environmental taxes, with the first vehicle tax being introduced in 1888. The revenues from fuel duties used to be allocated to building new roads and infrastructures but this was encouraging more vehicles to be used and therefore resulting in more emissions. Government now allocates these revenues to its environmental policy. The fuel duty is applicable to nearly all road vehicles. A fuel duty escalator was introduced in 1993 and the duty was increased every year in relation to inflation, but this policy was later discarded as a result of protests over exceptional fuel rates (Devenney & Parkes 2009).
In June 1999 small cars with engine sizes less than 1100cc paid an engine tax of £100 per year compared to the cars with more than 1100cc engines which paid £155 per year. This system remains in place for cars which registered before 1 March 2001. However, these rates have changed. Now, cars that were registered after March 2001 with an engine size less than 1550cc pay £110 per year and those with larger engine sizes pay £175 per year. For cars registered after 1 March 2001 a Vehicle Excise Duty (VED) is levied based on the emissions-rating of the vehicle purchased. In 2006, an enhanced system of VED was approved and announced in the budget. This system of ‘graduated’ VED (GVED) has made adjustments whereby it will not charge an emissions tax on vehicles which emit 100g (Band A – the lowest category) or less of CO₂ per kilometre driven and it will charge a new higher rate for high CO₂ emitting vehicles (if they are more than 226g per kilometre) of £210 per year (Band G – highest category). Refer to figure 3.1 below for the rates of VED for 2000-2007 (ed. Payne 2006, p. 15).

<table>
<thead>
<tr>
<th>Annual rates of VED / GVED for petrol cars</th>
</tr>
</thead>
</table>

**Registered before 1 March 2001**

<table>
<thead>
<tr>
<th></th>
<th>Standard rate</th>
<th>Small car</th>
<th>Engine size (small car)</th>
<th>A (100 or less)</th>
<th>B (101-120)</th>
<th>C (121-150)</th>
<th>D (151-166)</th>
<th>E (166-185)</th>
<th>F (186-225)</th>
<th>G* (226 or more)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-01</td>
<td>£155</td>
<td>£100</td>
<td>1,099cc</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£155</td>
</tr>
<tr>
<td>2001-02</td>
<td>£100</td>
<td>£105</td>
<td>1,199cc</td>
<td>£70</td>
<td>£70</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£100</td>
<td>£155</td>
</tr>
<tr>
<td>2002-03</td>
<td>£160</td>
<td>£105</td>
<td>1,549cc</td>
<td>£65</td>
<td>£75</td>
<td>£105</td>
<td>£125</td>
<td>£145</td>
<td>£160</td>
<td>£155</td>
</tr>
<tr>
<td>2003-04</td>
<td>£165</td>
<td>£95</td>
<td>1,549cc</td>
<td>£65</td>
<td>£75</td>
<td>£105</td>
<td>£125</td>
<td>£145</td>
<td>£160</td>
<td>£165</td>
</tr>
<tr>
<td>2004-05</td>
<td>£165</td>
<td>£95</td>
<td>1,549cc</td>
<td>£65</td>
<td>£75</td>
<td>£105</td>
<td>£125</td>
<td>£145</td>
<td>£160</td>
<td>£165</td>
</tr>
<tr>
<td>2005-06</td>
<td>£170</td>
<td>£110</td>
<td>1,549cc</td>
<td>£65</td>
<td>£75</td>
<td>£105</td>
<td>£125</td>
<td>£150</td>
<td>£165</td>
<td>£165</td>
</tr>
<tr>
<td>2006-07</td>
<td>£175</td>
<td>£110</td>
<td>1,549cc</td>
<td>£65</td>
<td>£75</td>
<td>£105</td>
<td>£125</td>
<td>£150</td>
<td>£165</td>
<td>£210</td>
</tr>
</tbody>
</table>

*Band G of GVED applied to cars registered on or after 23 March 2005; cars registered before then pay the band F rate.

Figure 3.1 Rates of VED for 2000-2007

Source: ed. Payne 2006

VED has proven to be a great incentive to reduce carbon emissions. With the high rates of VED for high CO₂ emitting vehicles, many motorists have chosen not to run a car at all. It has also sparked an increase in consumers purchasing less polluting models of cars. Data from the Society of Motor Manufacturers and Traders Ltd show that car emissions have consistently decreased as a result of consumers choosing to own low emission vehicles. It is still not clear whether this is directly as a result of VED as this trend started before VED implementation in 2001. This decline is also partly owing to the shift to diesel powered vehicles as more and more consumers are opting for diesel vehicles that have much lower emissions. It can thus be assumed that VED sparked an environmental consciousness.
amongst consumers and hence this consistent decrease in motor vehicle emissions. The amount of emissions also depends on the technology of the vehicle manufacturer. (ed. Payne 2006, p. 15).

Refer to figure 3.2 for the illustration of average new car emissions since 1997:

![Figure 3.2 Average new car emissions since 1997](source: Society of Motor Manufacturers and Traders Ltd. 2008.)

**3.3.2 Air Passenger Duty**

Air Passenger Duty (APD) was implemented for the first time in November 1993. It has been adjusted and restructured many times since its introduction.

This duty is charged on a person per-flight basis and it varies according to class, ticket and the minimum distance in miles from London. Air travel was seen as under-taxed in relation to other sectors as it received a zero rating for VAT. For this reason the treasury ministers maintain that Air Passenger Duty is not considered an environmental tax. However, many of the characteristics of flying such as noise pollution and CO₂ emissions are directly related to the frequency of flights and the distinguishing factors of the aircraft rather than the number of people on the aircraft. Therefore APD is in reality only an estimate that is charged for the air and noise pollution on a per flight basis (Adam et al., 2010: 242)

Figure 3.3 below illustrates total air travel revenues since 1994. There was a £5 charge for all passengers travelling within the European Union (EU) and £10 for all passengers travelling
outside the EU. In 1997 this rate doubled. This is indicated in fig. 3.3 with revenues doubling. With the introduction of new APD regulations in 2001, the APD revenues halved. This is as a result of the structure of the charges. The costs were changed as follows: £5 for economy passengers; £10 for higher classes of passengers within the EU; £20 for economy passengers; and £40 for higher classes of passengers outside the EU (ed. Payne 2006, p. 41).

Figure 3.3 APD
Source: ed. Payne 2006, p. 41

In the budget speech on 21 March 2012 the UK Government stipulated that APD rates would increase by double the inflation rate from 1 April 2012 with a further increase from 1 April 2013. The Office of Budget Responsibility (OBR) anticipated revenues from APD of £2.7 billion for 2011-2012 and £3.9 billion by 2016-2017. There are two rates: a reduced rate for economy class and a standard rate for premium classes (The Travel Association, 2012). Figure 3.4 illustrates the various current and proposed rates:

<table>
<thead>
<tr>
<th>Band</th>
<th>Reduced rate</th>
<th>Standard rate</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Current Rate</td>
<td>Rate from 1 April 2013</td>
</tr>
<tr>
<td>Band A (0–2000 miles*)</td>
<td>£13</td>
<td>£13</td>
</tr>
<tr>
<td>Band B (2001–4000 miles)</td>
<td>£65</td>
<td>£67</td>
</tr>
<tr>
<td>Band C (4001–5000 miles)</td>
<td>£81</td>
<td>£83</td>
</tr>
<tr>
<td>Band D (over 5000 miles)</td>
<td>£92</td>
<td>£94</td>
</tr>
</tbody>
</table>

*Includes direct long-haul flights from Northern Ireland

Figure 3.4 Rates of flight bands
There are environmental merits in the use of APD. It has increased the cost of flying as well as reducing unnecessary flights undertaken by consumers (ed. Payne 2006, p. 42).

According to a Canadian study by Gillen, Morrison and Stewart in 2004 the demand varies according to the type and length of the journey. Demands for business flights are less likely to change. A 10% price increase in tickets resulted only in a 7% reduction in demand for short-haul business flights and a 2.5% reduction in long-haul business flights. This is compared to leisure flights where a 10% price increase resulted in a 10% reduction in long-haul leisure flights and a 15% reduction in short-haul leisure flights (Fullerton et al., 2008: 43).

This is an indication that the demand is reactive to the price of the flights. Therefore, one can conclude that the APD is an environmental tax. However, it can also be suggested that the UK’s APD taxes are not optimal. Instead of basing the taxes on the passenger, more attention should be paid to the environmental impact of every flight. More revenues could be generated from aviation taxes that are based on the climate impact, noise pollution and other environmental considerations that occur from individual flights. However, a standard system of taxing would require international concurrence (Fullerton et al., 2008: 56).

### 3.3.3 Landfill tax

The UK Government introduced taxes on landfill waste in 1996. This was done to increase the cost of waste disposal and thereby encourage recycling of waste products. In the Customs and Excise Commissioners v. Parkwood Landfill Ltd [2002] case, the High Court used the tax provisions for the first time. The dispute was to determine whether the landfill operators should be taxed on waste that was sent to sites used for recycling operations that would eventually be used for roads. The Court of Appeal acknowledged the UK environmental policy regarding landfill and referred to a policy on landfill which was accepted in 1995. The case focused on the definition of waste and on who would be liable to incur the duty. The decision was eventually made by Lord Justice Aldous that the tax would be payable by the person who disposed of the waste and not the person who recycled it (ed. Macrory 2004, p. 203).
The landfill tax is payable by entities or individuals who hold a permit for the site. In some cases the permit holder for the site has no involvement in operating the site. If this is the case, the controller of the site is liable to pay the tax (HM Revenue & Customs, 2012).

The landfill tax policy is a typical example of how a policy can transform over time. Landfill tax is the tax charged on the disposing of waste. The rate of landfill tax has consistently increased, reaching £40 per tonne in 2009 and is expected to increase to £80 per tonne in 2014. In order for the UK to meet the high targets set by the 1999 European Landfill Directive, the Landfill Allowance Trading Scheme (LATS hereafter) was introduced. The purpose of LATS is to allocate a cap to the amount of landfill tonnage of biodegradable municipal waste of local English authorities up to the year 2020. The tax plays no role in reducing the landfill. The high tax rates and quantity cap on tonnage is in place merely to attain the given targets by LATS rather than to tax the landfill based on its damage to the environment (Adam et al., 2010).

Issues arising from instances such as the landfill tax example show policymakers that precise and effective targeting is difficult and destructive avoidance behaviour is a possibility. This is true, as the English government has recognised that raising costs of legitimate disposal such as landfill sites is most likely to lead to illegitimate dumping (Adam et al., 2010). In addition to this negative behavioural outcome, instruments such as price signals may be ineffective in changing behaviour. The major payers of landfill tax are local authorities which are responsible for disposing of household waste; however it is not possible to charge individual households because it is a municipal duty. Therefore, while councils have the responsibility to find alternative methods of waste disposal, it is unlikely for individual households to alter their behaviour in any way because they are not affected by the price signal (Adam et al., 2010).

Landfill taxes are an example of how complicated environmental tax policies can be. Taxing of waste disposal could lead to the right tax incentives such as: incentives for producers to use designs that promote recycling; companies to sell products with less packaging; and stores to re-use packets. But this approach would be difficult to measure and enforce. A more complex hybrid instrument which combines taxes and subsidies and other forms of regulation might be more effective (Fullerton et al., 2008: 47-56).
3.3.4 Aggregates levy

The Aggregates levy which was initiated in 2002, was used to attend to the environmental externalities that came about as a result of industrial utilisation of aggregates. (i.e. the commercial exploitation of rock, sand and gravel.) The current levy is £2 per tonne. The businesses that are charged this levy are granted a reduction in the National Insurance contributions in order to neutralise the tax charged (Adam et al., 2010).

3.3.5 Climate Change Levy

In 2001, the United Kingdom brought about the Climate Change Levy (CCL), which taxed electricity usage, coal, natural gas and petroleum gas used by businesses. The large businesses that agreed to the Climate Change policy would only be taxed at 20% of the CCL if they managed to meet the goals agreed upon in the Climate Change Agreement (CCA). This was done in order to reduce the international competitiveness that the businesses would face from countries that do not apply such taxes. An instrumental approach was used towards the prejudice where certain firms were only subject to CCAs whereas others were subject to the full CCL levy. The implementation of these levies resulted in the businesses which made use of CCAs increasing their emissions by over 20% compared to the firms subject to the CCL. The CCA entities also increased their electricity usage as a result of the higher rates on electricity for CCL entities. Regarding the economic performance, no changes were observed relating to the productivity and employment. It was found that firms with CCAs that were given an 80% reduction in the CCL rate were more energy consuming compared to businesses that were paying full rates. It was also found that businesses with CCAs were not as likely to innovate compared to businesses paying the full price, especially with environmental elements. Regarding innovation, particularly with patents relating to climate change, there were very few differences between the two entities. This has made the classification of the data for climate change patents difficult and convincing conclusions are tricky to formulate (OECD, Taxation, Innovation and the Environment, 2010).

3.4 Environmental tax segments

It is fitting to highlight which sectors pay which portion of the UK’s environmental taxes in order to determine which segments are bearing the burden for environmentally damaging endeavours. The Office for National Statistics (ONS) made an attempt in 2002 to determine
which sectors paid environmental taxes. There are 13 sectors. Although there is no data available for recent years it is not likely that the percentage portions have changed significantly since 2002. £32.7 billion was accumulated for environmentally related taxes in 2002. Households paid £17.2 billion, £13.1 billion was obtained from domestic energy and £4 billion from transport. Transport and communications sector businesses paid about £6.2 billion, retail and the wholesale trade sector paid £2.3 billion and businesses in the manufacturing sector paid about £2.1 billion (ed. Payne 2006).

It is interesting to note that households pay the largest portion of environmental taxes and other more harmful endeavours, such as the mining sector, pay the smallest price. Refer to figure 3.5 below which illustrates the split of environmental payments among the 13 sectors in 2002.

![Figure 3.5 Split of Environmental payments](image)

Source: ONS, 2006

**3.5 Possible shortcomings in current system**

There may be flaws in the existing environmental taxes. The reason for this is as follows: although the UK generates billions in revenue every year from environmentally related taxes, it will not be able to solve the environmental crisis as well as generate significant income
indefinitely. The taxes on polluting activities as well as products are not significant and have not increased sufficiently over the past 15 years even though more environmental consciousness has been instilled in taxpayers and consumers. It may be a mistake to shift the tax base on environmental taxes as they will most probably become unsustainable in the long term. This is because these taxes are aimed to reduce or penalise environmentally unfriendly behaviour. If this is accomplished there will be much less tax revenue being generated from the environmental sector. It will thus eventually destroy its own tax base. The solution to this is to implement a well-balanced and broad tax base in the UK and other countries (Hudson & Roy-Chowdhury, 2009, p. 6).

3.6 Conclusion

The UK has an established system of environmental regulations and many laws are consistently being revised and introduced. The VED has had significant success by increasing environmental consciousness in motorists as well as vehicle manufacturers with the result being a decrease in vehicle emissions. APD has been successful in reducing unnecessary flights made by consumers. Landfill taxes, although very complicated, have been steering in the right direction by highlighting the need to recycle waste products. Regarding the CCA, it was found that firms with CCAs that were given an 80% reduction in the CCL rate were more energy consuming compared to businesses that were paying full rates. It was also found that businesses with CCAs were not as likely to innovate compared to the businesses that were paying the full CCL rate. This was not an entirely successful environmental tax endeavour (OECD, Taxation, Innovation and the Environment, 2010). Yet, although the UK environmental tax system does not seem to be a sustainable tax system, merit should be given to the fact that the policies in place were well conceptualised, are being implemented effectively, and the UK has been successful in achieving one of the most important goals: environmental awareness.
Chapter 4
United States of America

4.1 Introduction

There is considerable evidence that the warmer temperatures the world is currently experiencing are as a result of industries created and influenced by humans that cause carbon dioxide (CO$_2$) emissions (Mann, 2009a). CO$_2$ emissions have diverse sources. The main sources include emissions through industry activities, power generation, transport emissions, agricultural activities, deforestation and the handling of waste (Vermeend et al., 2008: 304). The costs relating to global warming are prone to have an effect on the poor, especially those who rely on industries affected by the weather such as agricultural and fishing industries, as these industries are at the mercy of specific weather conditions in order to thrive. $300 billion has been spent to date on the damage caused by severe weather events in the United States of America (hereafter referred to as ‘US’) (Mann, 2009a).

4.2 Kyoto Protocol

The Kyoto Protocol to the United Nations Framework Convention on Climate Change (UNFCCC) was completed on 11 December 1997, legally binding the industrialised countries to reduce six greenhouse gases, namely: Carbon dioxide (CO$_2$), Methane (CH$_4$), Nitrous oxide (N$_2$O), Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs) and Sulphur hexafluoride (SF$_6$) (UNFCCC, 2012b). The Protocol committed the US to reduce its greenhouse gases by 7% below their 1990 levels between 2008 and 2012. The US signed the Protocol on 12 November 1998 but the Clinton administration at the time did not submit the Protocol to the Senate for approval. This resulted in the Bush administration rejecting the Protocol in 2001. Thereafter the US merely attended the annual conferences without taking part in the Kyoto Protocol negotiations. The Bush administration announced in February 2002 that it would follow a US policy for climate change which would depend on national, voluntary actions to reduce emissions by 18% by 2012. The Protocol is only binding if a country ratifies it. Although the US had signed the Protocol, it did not ratify it; therefore it was not legally bound by its terms (Kyoto Protocol and the United States, 2006).
As seen above, congress and the Bush administration decided not to take part in the Kyoto Protocol. This made the US unpopular as it is the country with one of the highest greenhouse gas emissions and it put the US on the wrong footing regarding environmental policies from the start. This delay is quite worrying, as temperatures are expected to rise by up to 5.8 degrees Celsius by the year 2100 (US DoE, 2008a).

The greenhouse gas emissions in the US make up about 20% of worldwide emissions. The Kyoto Protocol enforces individual criteria for greenhouse gas reductions in each specific country. Perhaps this is why the US refused to sign the treaty, as it was a way to push the US into a corner to commit to reductions within a certain time frame (EIA, 2010b).

Although the US has not ratified the Kyoto Protocol, certain industries within the US have decided to adopt their own “Clean Development” frameworks. One such case is General Motors and American Electric Power which have invested $15.4 million to fund the acquisition and reforestation of land in Brazilian coastal areas (Randazzo, 2008).

Ex-president Bush opposed taking initiative in the enforcement of the Kyoto Agreement. Arguments opposing the enforcement included:

- According to The Times Poll, 38% of Americans felt that Bush opposed the Protocol as he believed that there was not enough evidence that greenhouse gases cause global warming (Kerr, 2010).
- Emissions of greenhouse gases are not increasing as rapidly as the US Gross Domestic Product.
- Developing countries have not played their part by taking steps to reduce their own emissions. Perhaps if all nations were equally concerned about their emissions more precautions as well as corrective steps could be taken.
- The implications of the reduced emissions in the US will perhaps result in a dip in the US economy as a result of reduced industrial output (King & Webber, 2008).

In March 2001, the then president Bush steered away from entering into the Kyoto Agreement stating that the Protocol is “fatally flawed” (Christensen, Wood, Voison, Lettenmaier & Palmer, 2004). However, in August 2001 the Senate Foreign Relations Committee called on the Bush Administration to reconsider the reduction of CO₂ emissions. If the US is late in adopting the Protocol, it might face compliance costs once it does sign (Christensen et al., 2004).
Ex-vice president Gore states that the most favourable way to reduce CO₂ emissions is to “put a price on the environmental consequences of our choices, a price that would be reflected in the marketplace” (US DoE, 2008b). One of the ways to reduce these emissions is by way of tax deductions for environmentally conscious behaviour.

When the Obama Administration came into power, it was very clear that the Kyoto Protocol was going to be rejected as with the previous regime. This was so, as the Senate found that it would be unreasonable for the new regime to adopt the policies and targets of the Kyoto Protocol and commit to these targets by the end of 2012 (the date of expiry), a very short time span to make significant change (Thernstrom, 2009).

However, with the Obama Administration, the US has managed to reduce oil imports by 10 percent (which equates to 1 million barrels per day) between 2010 and 2011 (The White House, n.d.).

Since the Obama Administration came into force, this is the first time the United States is cataloguing various greenhouse gas emissions from the largest sources. This will allow the reductions in carbon emissions to be measurable. In January of 2012 the Administration made an online tool available to the public which listed 29 different industrial categories of greenhouse gas pollution. President Obama also instructed the Federal Government to reduce its greenhouse gas emissions from direct sources by 28 percent by the year 2020 and greenhouse gas emissions from indirect sources by 13 percent by the year 2020. By adhering to these goals the Federal agencies could save up to $11 billion in energy costs as well as eliminate the need for 235 million barrels of oil over the next decade (The White House, n.d.).

With the Obama Administration’s investment in clean energy being the highest clean energy investment in US history, the US has almost doubled its renewable energy generation since 2008. Last year the US earned the title of the world’s leading investor in clean energy technologies. President Obama has also called on Congress to eliminate the ineffective tax breaks which the oil and gas industry enjoy. This would save US taxpayers around $4 billion per year (The White House, 2012).

In addition to this, since 2009 the Department of Interior has approved 29 onshore renewable energy projects as well as issuing permits for 10 000 megawatts of renewable power on
public land by the end of 2012. This would be able to provide power to 3 million homes (The White House, 2012).

It became apparent that President Obama was considering a tax on carbon emissions in order to assist in reducing the US budget deficit. This proposed tax would start at $20 per metric ton of carbon dioxide and would increase by around 6 percent per year. This would force the polluting companies to internalise their costs of pollution (Turley, 2012).

However, this proposition was recently dismissed by Congress, as it was considered a burden for family budgets, job seekers and energy consumers. A White House spokesperson reiterated that they have no intention of proposing a carbon tax (Alpert, 2012). This once again places the US in an unfavourable position regarding the implementation of carbon taxes.

4.3 Tax deductions

The usage of fossil fuels creates emissions which harm human health e.g. lung-related diseases. Based on recent research, if Greenhouse Gas mitigation is put in place, Mexico City, New York City, Santiago and Sao Paulo can save 64,000 people by 2020 (Joint Commission on Taxation, 2009).

Fossil fuel industries have the benefit of much larger tax deductions on their taxable income compared to other industries. As it is uncertain how many reserves there are in an oil well, the Internal Revenue Service has allowed a percentage depletion method for independent oil producers and royalty owners where the total amount of deductions may be more than the cost of the shareholding in the asset (Mann, 2002).

The Percentage Depletion method allows a 15% deduction for royalty owners and independent producers limited to 100% of the net income of the property for the year. To further highlight the excessive benefits that oil producers receive, there is a provision in place where if oil drops to less than $20 per barrel, the 15% depletion rate is increased by 1% for each dollar that it drops limited to a maximum of 25% (Mann, 2002).

Promoters of gasoline used to portray gasoline tax as an environmental tax. This was not a true reflection of what it really was, as over 80% of the revenue generated was used to subsidise road construction which lead to more pollution. After taking into account inflation,
gasoline tax rates have dropped to almost half their charges in the 1930s (taxpolicycenter.org, 2011). (Refer to figure 4.1 below)

![Figure 1. U.S. Gasoline Tax Rates, 1933-2005](image)

**Notes:**
- Adjusted for inflation, 2006 dollars


**Figure 4.1 US Gasoline Tax Rates**

Source: taxpolicycenter.org, 2011

From the above, it seems that oil producers benefit from much higher tax deductions compared to alternative energy producers. This is an indication of the complete contradiction in the policies that are followed by the US government where on the one hand, the country is promoting the alternative energy market and on the other, it is supporting the oil and gas market.

The SAFE Act (Securing America’s Future Energy Act of 2001) was passed on 1 August 2001. It established certain tax incentives and tax credits which aimed to reduce the US dependence on foreign energy sources by 11% before 1 January 2012. These included incentives and tax credits for: oil and gas production, new offshore oil structures, emission reductions and improvements in coal-based electricity generation, application of advanced clean coal technologies, prepayments for natural gas, electric power, spent nuclear fuel storage, energy efficiency, alternative fuels and renewable energy (Mann, 2002).
Other goals of the act included reducing US dependence on Iraqi oil from 700,000 to 250,000 barrels per day by 1 January 2012, as well as improving environmental quality with the reduction of CO₂ emissions (World Nuclear Association, 2010). Stipulations in the SAFE Act also provide for a 15% tax credit for residential solar hot water (limited to $2,000), a larger tax credit for electric vehicles, and a tax credit for increasing the conservation of energy in homes (Mann, 2002).

It is important to note that the alternative energy sources are not going to be sufficient if there is no consideration for the need to reduce the demand for energy sources that contribute to global warming. This is because the American people do not currently realise the gravity of the issue at hand and therefore they do not acknowledge the need for alternative energy sources.

Although these were plausible goals that were set forth a decade ago, it is questionable whether the nation’s social consciousness was prepared to successfully enact policies of such a scale.

4.4 Carbon taxes

Congress has proposed the introduction of carbon tax several times but none has been enacted. Two of the proposed taxes were: differing rates on different fuels depending on carbon content and a $50 tariff per tonne of carbon dioxide emitted by power-generating units. If these carbon taxes are enforced the taxes will be collected and reinvested to establish a Clean Air Trust Fund, which will fund the initiation of a carbon sequestration strategy to counteract increases in US carbon dioxide emissions and to execute methods of biologically managing carbon dioxide. The latest proposal includes an excise tax of 30 cents per megawatt of power produced by fossil fuel-producing power plants (Mann, 2009b).

4.5 Green incentives

An example of a green incentive is the implementation of a tradable permit system to regulate greenhouse gases (Stavins, 1997). A tradable permit system is a system where the government grants a credit or permit to organisations that voluntarily reduce their emission rates below their historical baseline levels. These organisations can then sell these credits or permits to other organisations which are unable to meet their emission reduction targets.
Hybrid environmental instruments have been reviewed by the government where they merge quantity restrictions with a price cap. A hybrid environmental instrument is an instrument that combines the features of various environmental instruments in their pure form (Mann, 2002).

4.5.1 Proposed greening incentives

Certain suggestions of green incentives include a guarantee by the government where if the freely traded permits surpass a certain price, more emission permits will be issued at a lesser price. If the target price is set low enough then the extra cost of the government guaranteed permits has the effect of an emissions tax. A credit will be granted equal to the amount of qualified investment in an alternative energy plant per year. This will also create a tax credit for the expenses created during the year in the eradication of green house gas emissions (Mann, 2002).

Another proposal was that unused credits be carried forward into the next year. This would allow for performance standards to be surpassed if the facility has enough emissions credits (Mann, 2002).

Senator Sam Brownback proposed the creation of a carbon sequestration credit (Mann, 2002). According to this proposal the qualifying tax payer will be entitled to receive a $2.50 credit for every tonne of carbon sequestrated (storage of carbon dioxide in underground reservoirs) per year. This is limited to 50% of the investment in the sequestration project. This bill needs a panel that grants the go-ahead of the project as well as allocate up to $200 000 in tax credits annually. It also has the power to withdraw such credit if the tax payer does not meet certain terms and conditions. Brownback’s policy does not make the administration of tax policies any easier as it requires another level of government to ascertain whether or not to revoke such credit if necessary (Mann, 2002).

The discontinuation of fossil fuel subsidies as well as creating tax benefits for carbon sequestration will promote conservation of the environment, improve public welfare and perhaps avoid the disaster of global warming. It can even be considered as a moral essential. Up to now too much focus has been placed on the fiscal value of the earth’s resources, not taking into account other values resulting in inaction until catastrophe strikes. The goals of changing tax policies should be economic as well as moral (Mann, 2002).
4.5.2 History of greening taxes in the US

Even though climate change strategies are still being dealt with by the US Congress, it is not a new notion. In the 1970s the Unites States was at the forefront of using taxes to decrease pollution (Milne, 2008).

A tax on lead additives in gasoline and a sulphur dioxide tax were introduced in 1970 by President Nixon. Although these schemes were not put into place, a tax on petrol-guzzling cars was introduced and implemented in 1978 followed by a tax on chemicals in 1980 which was used to eradicate hazardous waste sites (Milne, 2008).

The US was also at the forefront of permit trading administrations, by using them to put in place laws on gasoline in the 1980s, ozone diminishing chemicals in 1988 and sulphur dioxide in 1990. The latest policy that has been implemented is a $0.03 tax per litre of gasoline or jet fuel. However, the European countries have taken the helm in greening taxes and trading regimes as of late (Milne, 2008).

4.6 Energy sources

With the switch to natural gas, the US is using less and less coal. With the harsh regulations on CO₂ emissions, more and more coal-fired power plants are shutting down with the last power plant in Oregon shutting down in 2020. The Powder River Basin in the north-eastern region of Wyoming has one of the richest deposits of coal in the world. 400 million tonnes of it were mined last year. The US Energy Information Administration expects the demand for coal in the electricity sector to drop by 14% this year. Although this seems promising with regards to environmental responsibility, the US is still mining the coal. This is because China, the biggest polluter in the world, has had double the demand for coal this year compared to last year and US coal companies are trying to encourage coal exports to China. Although the US is meeting its environmental goals domestically, the exporting of coal to China and other Asian countries will result in cheaper global prices of coal and therefore encourage these countries to burn more of it. By exporting coal to these Asian countries, the US is indirectly going to be responsible for increasing global carbon emissions. (Walsh, 2012: 45-46).

The US decided to shift its governmental support towards renewable energy sources after the threat of climate change became more apparent in recent years. However, the hurry to move
to the alternative energy market was short-sighted. The government failed to acknowledge that there is a potential threat of water shortages and water pollution as a result of these alternative energy sources being supported (Mann, 2009a).

Currently the US government has a few policies in place in order to promote the reduction of greenhouse gases in the US. This involves imposing control over emissions; enforcing carbon taxes or cap-and-trade systems on carbon-intensive fuel sources in order to make them more expensive; and subsidising alternative energy sources in order to promote them directly or by using tax reductions. As of 2010, Congress has not succeeded in enforcing a detailed federal climate change regulation (Broder, 2010). Although the policies exist, none of them have been enforced.

It is important to note that most of the electricity in the US is produced by natural gas, nuclear power and renewable energy sources. Natural gas produces 23% of the total; nuclear power produces 20%; and renewable sources including hydroelectric, geothermal, solar, wind and biomass collectively produce 11% (EIA, 2008). It must not be overlooked that massive amounts of water are used in all these electricity-producing processes. Electricity is generated by turbines which need steam to stay in motion. Water is not only used to produce steam to move the turbines but it is also used as a coolant (Karl, Melilo & Peterson, 2009).

One must not merely focus on the effectiveness of a renewable energy source without taking into account the impact that it may have on water resources. If more water is used up in order to make the alternative energy source work or if it pollutes the water, then it may lead to another environmental disaster.

**Energy sources can be categorised into renewable and non-renewable sources:**

Renewable energy is generated from natural resources and can be regenerated indefinitely.

Non-renewable energy is obtained from limited sources that are available on earth and cannot be regenerated within a short time span (King & Webber, 2008).

**4.6.1 Non-renewable fuels**

The following non-renewable fuels are widely used in the US. It will become evident that the more conventional fuels such as petroleum require much less water to be produced than the non-conventional fuels such as tar sand (King & Webber, 2008).
Petroleum: petroleum products constitute 95% of the US Transportation fuel requirements (EIA, 2010a). It was determined by researchers Carey King and Michael Webber of the University of Texas that petrol and diesel that fuelled light-duty vehicles consumed between 0.30 and 0.87 litres of water per km. It was concluded by King and Webber that the petroleum-based fuels have had a small impact on US water sources compared to alternatives which use much more water. Therefore, the water consumption of alternative fuels must be considered before making a shift towards these alternative energy sources (King & Webber, 2008).

Natural gas: liquid fuels used in transportation can be produced using fuel sources other than petroleum. According to King and Webber, production of natural gas from shale deposits can result in gas infiltration into permeable, porous rocks, resulting in pollution of drinking water for those living in the vicinity of an active fracking well. It was found that production of natural gas-based liquid fuels also results in double the water usage compared to petroleum-based fuels (King & Webber, 2008). This is as a result of the process called fracking (short for hydraulic fracturing) which involves tonnes of explosives, chemicals and millions of gallons of water which fracture the shale hundreds of feet underground, thereby releasing trapped supplies of gas. Fracking for natural gas has significantly changed the gas industry in the US. There is such an abundance of gas being produced that the US natural gas prices recently hit a ten-year low (Walsh, 2012).

Coal: King and Webber found that the production of fuel from coal uses more water than the production of liquid fuel from gas. The mining of coal also causes water pollution. This is as a result of the run-off from the mining operations which can consist of acid sulphides and toxic heavy metals which drain into local streams (Barnthouse, Cada, Cheng, Easterly, Kroodsma, Lee, Shriner, Tolbert & Turner, 1994).

Nuclear: nuclear power generates the most electricity. On the one hand, nuclear power does not emit greenhouse gases but on the other, it uses up the most water in order to operate the nuclear plants. Most of the 104 nuclear power plants in the United States are strategically based on shores of lakes and rivers. This allows them to extract billions of gallons of water and once the process is complete, they emit toxic hot water back into lakes and rivers (Union of Concerned Scientists, 2007).
• Tar sands and oil shale: water is the major component which is consumed in processing tar sands. Oil shale involves intense mining and drilling in order to extract it. In addition to this, light fuel used from oil shale and tar sands uses ten times more water compared to regular petroleum (King & Webber, 2008).

Taking into account what has been mentioned above, it is evident that non-conventional, non-renewable resources such as liquid fuel from coal and tar sand use much more water compared to regular fossil fuels such as petroleum-based gasoline. This must be considered before crossing over to non-conventional energy sources as water is a scarce commodity.

4.6.2 Renewable fuels

The following list contains the most common renewable fuels used in the US:

• Ethanol: in the US, 95% of the production of ethanol is used from corn. In order to grow the corn needed for production, an excessive amount of water is needed. The use of corn for ethanol also competes with food uses of corn (Yacobucci, 2007).
• Biodiesel: similar to ethanol, biodiesel uses an exceptional amount of water to irrigate the soybeans from which it is made (Mann, 2002).
• Biomass: the burning of biomass (animal and vegetable derived material) directly as opposed to turning it into liquid fuel is much more efficient with regards to water consumption (Gerbens-Leenesa, Hoekstra & Van der Meer, 2009).
• Wind: according to the US Department of Energy, wind does not use water in generating electricity (US DoE, 2006). In a 2008 study, the US Department of Energy determined that if wind-generated electricity supplies around 20% of the total US electricity by the year 2030, it will result in a 17% reduction in water usage in the electric division (US DoE, 2008a).
• Solar: electricity from solar photovoltaic panels uses very little water. However, many toxic waste products are formed when manufacturing these panels (Pasqualetti & Kelley, 2007).
• Geothermal: this generates electricity by channelling the heat under the earth’s crust. In theory, this is a water-efficient source of energy. Steam is generated by pumping water into sedimentary hotspots in the crust which is then used to produce electricity (Union of Concerned Scientists, 2009). However, there have been cases where an
abundance of water has been used in order to assist in the cooling processes (National Renewable Energy Laboratory, 2008).

- Marine renewable energy: energy is generated with the use of wave energy converters which absorb the energy from a wave when it is formed. Wave energy converters do not consume water resources excessively. Yet, marine life may be harmed if fish collide with the wave energy converters (Nelson, 2008).

The following table illustrates the water efficiency of various sources of energy:

<table>
<thead>
<tr>
<th>Technology</th>
<th>Lifecycle Greenhouse Gas emissions per unit of energy</th>
<th>Water consumption per unit of energy</th>
<th>Water pollution factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wind</td>
<td>Zero</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Coal (no sequestration)</td>
<td>High</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Coal (CCS)</td>
<td>Low</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Solar</td>
<td>Zero</td>
<td>Low + Medium</td>
<td>Low</td>
</tr>
</tbody>
</table>

Table 4.1 Water efficiency of various sources of energy

Source: Mann, 2009a

The US Government does not seem to consider the impact on water when creating and approving alternative energy incentives. The factors mentioned in each of the alternatives above must be considered before an incentive is approved. As seen in the above table, wind and solar energy are the most water-efficient and non-polluting (Mann, 2009b).

4.7 Tax incentives

Specific tax incentives have been allocated to certain industries and types of energy sources. The US government has been allocating tax incentives for energy usage for a while now. These incentives ease the tax incurred on income produced by preferred industries (Mann, 2009b). The different forms of incentives that the US government makes available include tax credits (a credit allowed for a portion of an amount which a taxpayer owes the government), accelerated deductions, or exclusions from income derived (Mann, 2002).
Of all the incentives allocated, the fossil fuels enjoyed a significant portion of the benefit up until very recently. In 2007, governmental support for the energy sector amounted to $16.6 billion dollars. Of this, the tax incentives amounted to $10.4 billion (Mann, 2009b).

The tax incentive for fossil fuels dropped from 60% of total tax subsidies for energy in 1997 to around 50% in 2007 (Metcalf, 2009). However, new legislation in 2008 and 2009 has allowed for $40 billion of environmental tax expenditures (Joint Committee on Taxation, 2009).

The following energy incentives are being enjoyed by the various industries in the US:

4.7.1 Fuel for transportation

- Oil:

  The oil and gas tax incentives (deductions) include: the enhanced oil recovery credit; the marginal well tax credit; the expensing of intangible drilling costs; the deduction of tertiary injectants; and the domestic manufacturing deduction for oil and gas production among others (Mann, 2009b).

  As the oil industry is very well established it is not necessary to continue implementing subsidies (Editorial, 2010). This also does not assist with the shift to the use of renewable energy sources, for by subsidising oil production it creates lower prices for petroleum products, therefore increasing their demand (Mann, 2009a).

- Efficient vehicles:

  The federal government has allowed incentives for energy-efficient vehicles since 2005. Every manufacturer was allowed a credit against his or her tax payable for up to 60 000 units of hybrid vehicles. This credit expired in 2010.

  The Emergency Stabilization Act of 2008 provided another tax credit for customers purchasing plug-in electric drive vehicles. The credit ranges from $2 500 to $15 000 on the purchase price of the vehicle, depending on the battery life and weight of the car. This credit was limited to 200 000 units per manufacturer and the credit was capped in 2009 at $7 500 and valid until 2011. There are also tax credits for fuel cell vehicles, lean-burn vehicles and alternative-fuel vehicles (Mann, 2009b).
• Ethanol:

The US federal government also provides tax incentives for alternative fuels. Ethanol enjoys the largest tax credit. The largest tax incentive for alternative fuels is the Volumetric Ethanol Excise Tax Credit (Mann, 2009b). These tax breaks include a 14-cent per litre tax credit on ethanol imports, a 27-cent per litre tax credit to cellulosic ethanol producers and a 2.65-cent per litre tax credit for small producers of ethanol.

Congress has decided to reduce the tax subsidy for corn ethanol and increase the subsidy for cellulosic ethanol. Cellulosic crops (a type of crop from which biofuel is generated) are very easily cultivated and are not expensive to grow. They do not need irrigation or agricultural efforts, thereby contributing to more efficiency in the usage of water (Service, 2009).

4.7.2 Electricity

The tax incentives for renewable power allow the taxpayer a choice: he or she can use the Production Tax Credit (PTC) or the Investment Tax Credit (ITC). The PTC is used to reduce the income taxes of owners of renewable energy projects based on the electrical output of their renewable energy source. Every kilowatt-hour (kWh) which is produced by the renewable energy source reduces the amount of income tax owed, thereby providing an incentive for these owners to continue to use and further develop alternative sources of energy, e.g. wind, biomass and geothermal technology. The ITC is used to reduce the federal income taxes of owners based on their capital investment in the renewable energy project. The investment tax credits are received when the capital equipment is put into use. This assists in offsetting upfront investments in renewable energy projects and therefore provides an economic incentive to erect more costly renewable energy technologies, e.g. solar photovoltaic systems (Mann, 2009a).

• Coal:

Coal is a preferred energy source as it is inexpensive and easy to get hold of. However, it is the highest emitter of CO₂ among fuels. Coal emits between 93 and 103 kilograms of CO₂ per billion joules of energy (Energy Information Administration, 2010). Electricity generated from nuclear, wind or solar power emits no CO₂ (Mudd & Diesendorf, 2008). It is also important to note that coal is not only a huge greenhouse gas emitter and water
polluter but it causes adverse health effects on those mining the coal and surrounding communities (Mann, 2006). The US federal government has given $2.55 billion in tax credits for investing in clean coal facilities. Clean coal facilities are facilities that make use of techniques to reduce the pollutant emissions into the atmosphere when burning the coal (Mann, 2002). With the use of Integrated Gasification Combined-Cycle (IGCC) technologies clean coal provides a more efficient way of reducing CO₂ emissions (Goodell, 2007). Tax credits are given to these IGCC plants (Environmental Protection Agency, 2006).

- Nuclear:

Although there are no direct emissions with nuclear power, they pollute and degrade water quality. After nuclear power was excluded from the tax subsidy for a number of years, the Energy and Investment Tax Act decided to allow a 1.8 cent per kWh tax credit produced from qualified nuclear facilities. A taxpayer operating a qualified facility can claim up to $125 million in tax credits per 1 000 megawatts of allocated capacity limited to an eight-year period. An advanced nuclear facility is a nuclear facility which produces electricity and has a reactor design that was approved after 1993 by the Nuclear Regulatory Commission. In order to enjoy the credit, the facility must be in place after 8 August 2005 and before 1 January 2021 (Mann, 2002).

- Renewable energy:

Up to 7% of the total US energy supply is made up of renewable energy. The biggest portion of renewable energy is biomass (52%), hydroelectric (34%), wind (7%), geothermal (5%) and solar (1%) (Energy Information Administration, 2010). The tax credits available for renewable energy include the production tax credit and the investment tax credit. The investment tax credit provides for 10% to 30% of the project cost (Mann, 2002).

Although the US government promotes energy efficiency with regards to greenhouse gas emissions with the use of tax incentives, a rather important aspect has been overlooked: the water usage and water pollution of these non-emitting resources could far outweigh their emissions.
In order for the US to address this issue, more emphasis should be placed on economic instruments. The usage of economic instruments can influence behaviour. Economic instruments include subsidies (incentives) and taxes (deterrents) used to encourage a beneficial activity by decreasing its cost or discouraging harmful activity by raising its costs. The most popular means of discouraging a high emission activity include carbon taxes and cap-and-trade mechanisms (Mann, 2009a).

While discouraging environmentally indifferent behaviour it forces the market to choose an environmentally conscious behaviour. By using tax incentives, the costs of the preferred energy sources are reduced.

It would be more effective to tax the energy fuels directly rather than spend money to subsidise methods of conservation (Toder, 2009).

Unfortunately it seems that Congress is not skilled enough to determine which technologies are environmentally effective and cost-efficient. Instead, the decision to subsidise a certain technology is based merely on political considerations (Mann, 2009b).

4.8 Conclusion

As can be seen in this chapter, the US has proposed a variety of environmental tax incentives but only a handful have been put into practice. The US may have many proposed incentives, yet Congress and the Bush Administration decided to not take part in the Kyoto Protocol which forms the foundation block of an environmentally-conscious government. This was the first step in the wrong direction the US took regarding environmental awareness. It has also become evident that there is a contradiction in the policies that are followed by the US government regarding subsidies: where on the one hand it is promoting the alternative energy market and on the other, it is supporting the oil and gas market. The federal government should continue to give incentives for the reduced usage of petroleum products.

The US was also at the forefront of permit trading during the 1980s to 1990s regarding laws on gasoline, ozone diminishing chemicals and sulphur dioxide. Yet, it is evident that the European countries are now at the helm of greening taxes and trading regimes.
Much ado has been made regarding the use of renewable fuels as opposed to non-renewable fuels in the US. Unfortunately the adverse effect on the water involved in the processes has been overlooked. There is a risk of over-usage as well as contamination of the already scarce water sources used in the processes mentioned above.

With the Obama Administration more effort has been made with respect to environmental expenditure and environmental targets. There was however a setback regarding a proposed carbon emission tax which the administration was considering that was recently dismissed by Congress.

The US is on the right path to addressing environmental awareness with new legislation in 2008 and 2009 allowing $40 billion in tax incentives being allocated to environmental tax expenditures. Although there are many proposed incentives and taxes in US draft bills and acts, it is imperative that these proposed environmental tax structures are actually implemented before it is too late.
5.1 Introduction

There is very little information on environmental tax policies in South Africa. The policies and Acts in existence are not as comprehensive as is evident in the chapters discussing the United Kingdom and the United States of America.

South Africa agreed to the Kyoto Protocol in 2002. The Kyoto Protocol set binding targets for developed countries to reduce their greenhouse gases by 5 percent during the period 2008 to 2012 (expiry date) compared to 1990 levels. However, South Africa was considered a developing country in terms of the Convention and therefore was not obliged to conform to the requirements set out. This resulted in South Africa not being able to make use of any of the flexible mechanisms as set out in the Kyoto Protocol. South Africa therefore has to rely on its domestic measures to voluntarily reduce its greenhouse gas emissions by implementing certain environmental taxes (Department of Environmental Affairs, n.d.).

The South African Draft Taxation Laws Amendment Act of 2009 introduced two incentives in support of sustainability objectives for the environment: firstly, an income tax incentive for any business that is involved in a clean development mechanism. It applies to the disposal of carbon emission reductions and the disposal of such carbon reductions will be exempted from income tax. Secondly, the Draft Taxation Laws Amendment Act proposes that businesses will be able to obtain deductions from income tax for energy saving provided that there is documentary proof of the resulting energy efficiencies endorsed by the Energy Efficiency Agency (Temkin, 2009).

South Africa has made sufficient efforts to feature among the developed countries that are just as serious about addressing climate change. This was evident in November 2011, when South Africa hosted the COP17 convention. The outcomes of the international negotiations under the United Nations Framework Convention on Climate Change (COP17) and the Kyoto Protocol will be highlighted.
• The decision to increase the transparency of developing countries’ national mitigation actions.
• Commitment to review and assess the developed countries’ domestic emission reduction targets and commitments.
• Full implementation of a number of international mechanisms to support mitigation and adaptation efforts on climate change in developing countries, particularly for those needed in least developed African and small island countries most vulnerable to the impacts of climate change but who have contributed the least to the problem.
• Preservation of a combined rules based system underpinning the mitigation regime by agreeing on a second commitment period.
• Development of emission reduction targets for countries not part of the Kyoto Agreement.
• Full implementation of international mechanisms to enable and support alleviation and adaptation efforts in developing countries.
• Establishment of a process to increase the transparency of the mitigation efforts of developed and developing countries (in light of the fact that various developed countries have not embraced the Kyoto Protocol).
• Strengthening of the international adaptation agenda by consolidating adaptation programmes under the Adaptation Framework and the implementation of the Adaptation Committee that will execute global work on adaptation.
• Placing Africa’s priority of adapting to the impacts of climate change on a worldwide agenda.
• Executing the outcomes that were successfully negotiated in Cancun last year in terms of a finance agreement on the detailed design of the Green Climate Fund steered by Trevor Manuel. The design includes mechanisms for bringing private sector and market structures into play so as to increase potential flow of subsidies into climate change responses.
• Launching a selection process for the host of the Climate Technology Centre.
• Implementation of the Climate Technology Centre and Network. One spin-off is the establishment of a national innovation structure for a low carbon and climate resilient future (Molewa, 2011).

It is interesting to note that no tax policies are mentioned in the COP17 address which may
be needed in order to achieve certain of the proposed targets mentioned above.

In December 2010 the National Treasury released a discussion paper titled *Reducing Greenhouse Gas Emissions: The Carbon Tax Option*. The National Treasury believes that the development of a tax policy in South Africa is strengthened with efficiency, impartiality and administrative feasibility. The purpose of environmental tax instruments to sustain the attainment of environmental goals has now been acknowledged. The National Treasury conducted a feasibility study of market-based instruments, specifically environmental taxes to support environmentally conscious practices which are on par with sound tax and fiscal policy incentives. This study was mentioned in an *Environmental Fiscal Reform Policy Paper* which was published in 2006. This paper provides a framework and the criteria to guarantee the consistent development of environmentally related tax policies. An all encompassing approach to the development of carbon tax policies is required to ensure alignment with current tax policies (National Treasury, 2010).

In the 2012 budget speech, Finance Minister Pravin Gordhan indicated that government has allocated R9.5 billion towards environmental protection. The speech was received with some cynicism as South African prisons were allocated as much as R17.9 billion. Although the amount allocated towards environmental protection is significant, it begs the question of whether South Africa is as focused on environmental protection as it is on other issues. The amount allocated for environmental protection of entities includes:

- Sanparks for tourism infrastructure;
- National Meteorology Institute for equipment;
- Department of Agriculture, Forestry and Fisheries to improve agricultural support services;
- The Land Bank to ‘conclude its recapitalisation’;
- Provincial and Municipal agricultural colleges; and
- The Department of Rural Development and Land reform for settlement of restitution claims.

Other proposals include a carbon tax for emitters of CO₂ of R120 per tonne. This emissions levy will come into effect in the 2013 / 2014 tax year. The levy will be escalated annually at 10% until the 2019 / 2020 tax year. The Minister indicated that an additional R4.7 billion
was allocated to the installation of one million solar water geysers as well as R600 million to be allocated to municipalities to install low-energy lighting (South Africa’s 2012 Budget Speech and what it means for the environment, 2012).

Details provided by SARS indicate that the budget speech shed light on carbon tax in order to create incentives to change behaviour and for the economy as a whole to focus on cleaner-energy technologies and the research and development of low-carbon emissions. The purpose of the budget is to encourage the development of sustainable practices which will encourage local municipalities, public and private sectors to put pressure on the government in order to steer the South African economy towards a low-carbon future (South Africa’s 2012 Budget Speech and what it means for the environment, 2012).

South Africa’s existing environmental taxes are contained in the Customs and Excise Act no. 91 of 1964 (the Customs and Excise Act). The allowances and expenditures relating to environmental endeavours are contained in the Income Tax Act no. 58 of 1962 (the Income Tax Act). There are also provisions for aviation fuel taxes contained in the Civil Aviation Authority Levies Act of 1998 (Act No. 41 of 1998).

The Customs and Excise duties will be discussed first, followed by the provisions contained in the Income Tax Act and Civil Aviation Act.

5.2 Customs and Excise Act

The Customs and Excise Act contains the following levies and duties relating to the environment:

- Fuel Levy and Road Accident Levy on petroleum products:
  These levies are collected indirectly through the price of fuel charged in order to compensate for the emissions caused by the vehicles. The rate of the fuel levy varies according to the type of fuel used. The petrol levy amounts to R1.98 per litre compared to the cleaner biodiesel fuel levy which amounts to R0.88 cents per litre (SARS, n.d.: 1). The Road Accident Fund (RAF) levy amounts to R0.88 cents per litre irrespective of which type of fuel is being used (SARS, n.d.: 1).
• Carbon Emissions Levy:
A Carbon dioxide vehicle emissions tax was introduced and came into effect on 1 September 2010 in South Africa. New passenger cars are now taxed on their CO\textsubscript{2} emissions at R75 per g/km for every extra g/km above 120 g/km that they emit. The tax is added to their purchase price. As an example, a Mercedes Benz B200 Turbo emits 190g/km. Therefore R75 per g/km must be charged above 120g/km. Therefore 70g/km x R75= R5250 additional cost to the purchase price of the vehicle (SARS, n.d.: 1).

• Plastic Bags Levy:
This levy is aimed at the retail consumer in order to reduce the pollution caused by plastic bags. The levy applies to plastic bags manufactured or imported into the country. The levy includes “carrier bags” – bags constructed with handles; “flat bags” – bags constructed without handles and “immediate packings” meaning bags that are used for products or goods that are packed in sets. The rate is set at 4 cents per any type of bag and the levy is payable by the plastic bag manufacturers (SARS, n.d.: 1).

• Electricity levy for electricity generated by using non-renewable (fossil) fuels:
This levy is included in the price of electricity charged and is paid by the electricity consumers. It aims to compensate for the non-renewable energy source that has been used to generate the electricity. Eskom as the electricity provider collects the charges. The rate of the electricity levy amounts to 3.5 cents per kilowatt hour. According to section 2b of the schedule, electricity generated from renewable sources is not subject to any electricity levy (SARS, n.d.: 1).

• Incandescent light bulbs:
There has been phasing out of filament light bulbs in South Africa and more households are using energy-saving light bulbs. The rate of environmental levy per filament light bulb regardless of voltage is set at R3 per light bulb on the manufacturing level (SARS, n.d.: 1).
5.3 Income Tax Act

Along with many allowances and inclusions, the Income Tax Act also allows for deductions against income for capital expenditure incurred on certain assets. When considering deductions, one always refers to section 11(a) of the Income Tax Act. This section deals with deductions relating to expenditure incurred in the production of income (South Africa, 1962f: section 11(a)). However this section is not likely to be used as the deductions available for environmental expenditure are normally capital in nature. The following sections in the Income Tax Act are the only ones that have been legislated regarding environmental expenditure and respective allowances in the South African Income Tax Act, 1962 (Act 58 of 1962):

- Section 12B: Deductions in respect of certain machinery, plant, implements, utensils and articles used in farming or production of renewable energy
- Section 37B: Deductions in respect of environmental expenditure
- Section 37C: Deductions in respect of environmental conservation and maintenance
- Section 11D: Deduction for research and development costs
- Section 12K: Exemption for Certified Emission Reductions
- Section 12L: Special Allowance for Energy Efficiency Savings

The above mentioned sections are discussed below:

It is also important to note that the deductions that have been allowed in this Act are not allowed to exceed the cost of the asset to the taxpayer. This is applicable to all sections.

5.3.1 Section 12B: Deductions in respect of certain machinery, plant, implements, utensils and articles used in farming or production of renewable energy

This section provides for an allowance (tax deduction) on:

- assets (other than livestock) used for the taxpayer’s farming activities; or
- machinery, plant or utensils used specifically for the production of bio-diesel or bio-ethanol; or
- assets used for the generation of electricity from wind, sunlight, gravitational water forces, biomass and improvements to such assets.
The deductions for such assets are as follows: 50% in the year that it was first brought into use, 30% in the second year and 20% in the third.

These deductions are subject to certain rules which are covered in the sub-sections of this Act (South Africa, 1962a: section 12B(1)(f)(g)(h), 12B(2)(a)(b)(c)).

5.3.2 Section 37B: Deductions in respect of environmental expenditure

These deductions are for assets (and improvements to these assets) used in environmental treatment or recycling and environmental waste disposal. These plants must be used for air, water or solid waste treatment. It is required that these plants are set up for the purpose of protecting the environment.

The deductions are categorised into 2 subsections:

- For new and unused assets used in environmental treatment, 40% of the cost to the taxpayer of the asset is allowable in the first year of use and 20% for 3 years thereafter.
- For a new and unused environmental waste disposal asset, 5% per year for 20 years.

These deductions are subject to certain rules which are covered in the sub-sections of this Act (South Africa, 1962b: section 37B(1), 37B(2)(a)).

5.3.3 Section 37C: Deductions in respect of environmental conservation and maintenance

The non-capital costs incurred by a taxpayer to maintain and conserve land is deductible if the expenditure is incurred in terms of a biodiversity agreement that has a period of 5 years which has been entered into by the taxpayer in terms of section 44 of the National Environmental Management Biodiversity Act. Any expenditure that exceeds the income of the taxpayer must not be deducted in the current year; it will rather be deemed to be expenditure incurred in the following year of assessment.

If the taxpayer is in breach of the agreements required above, the full deduction will be included as a recoupment in the taxpayer’s income for the current year of assessment (South Africa, 1962c: section 37C(1)(a), 37C(4)).
5.3.4 Section 11D: Deduction for Research and Development Costs

This section of the Act identifies what the term ‘research and development’ should mean in order to qualify for a deduction.

- It involves the systematic experimental activity of discovering scientific knowledge or inventing according to the Patents Act, or designing according to the Designs Act a computer program or the knowhow of use of such conception, or improving existing knowledge. The deduction allowable is equal to the expenditure incurred by the taxpayer in the production of income and the carrying on of a trade.
- In addition to the deduction allowed, the taxpayer is allowed to deduct a further 50% of expenditure if certain further requirements of the various Acts are met (South Africa, 1962d: section 11D(1)(a), 11D(3)).

In this case environmental research conducted under section 11D can be classified as environmentally friendly and therefore qualifies for a deduction under this section.

5.3.5 Section 12K: Exemption for Certified Emission Reductions

An exemption from normal tax is given to taxpayers who have received an amount relating to a certified emission reduction in the continuance of a qualifying Clean Development Mechanism project carried out by those people. The amount is included in the taxpayer’s gross income and then exempted, therefore it is not taxed (South Africa, 1962e: section 12K(1)).

A Clean Development Mechanism is defined in Article 12 of the Kyoto Protocol. It commits a country to an emission reduction project which earns credits that will count towards meeting Kyoto targets (UNFCCC, 2012c).

5.3.6 Section 12L: Special Allowance for Energy-efficiency Savings

For purposes of section 12L a concurrent benefit will be allowed. This is an allowance granted by any sector of the government for participating in energy-efficiency savings.

The taxpayer who claims the allowance must in the year of assessment:
- Register the energy-efficiency savings which the allowance is claimable for with the South African National Energy Development Institute (hereafter SANEDI).
- Appoint a verification professional to draft a report containing the energy-efficiency savings which the taxpayer has claimed in the year of assessment.
- Submit the certificate from SANEDI and a claim for the allowance to SARS.

It can be deduced that the type of allowance provided for under this section relates to large deductions based on the fact that there needs to be an eight-member committee in place by SANEDI which consists of industry specialists who evaluate all reports claimed by the taxpayer (Department of Energy, 2011).

At the time of writing this dissertation section 12L has not yet been enforced in the Income Tax Act.

5.4 Aviation Levies

In April 2012 the South African Civil Aviation Authority issued a Determination whereby a levy on the sale of aviation fuels is payable. The current levy payable amounts to 12.2 cents per litre. “Aviation fuel” means any fuel produced primarily for the propulsion of aircraft (Department of Transport, 2012).

Airport taxes are required by the National Treasury and are split into taxes, regulated charges, non-regulated charges and airline costs. The taxes as well as the regulated charges are collected on behalf of the National Treasury, Airports Company South Africa and the Civil Aviation Authority (Airports Company South Africa, n.d.).

5.5 Water Tariffs

Water tariffs on the usage of water vary between the different sectors. The price range per kilolitre varies between R1.36 and R4.08 per kilolitre. The Ethekwini and Rustenburg areas are the most expensive areas whereas the Sedibeng and Magalies area have the cheapest prices. The cost varies because of the availability of water in the different regions (Eberhard, n.d.).
Regarding waste water, the Department of Water Affairs and Forestry introduced a policy on waste water known as Waste Discharge Charge System (WDCS) in 1999. The purpose of this system was to enforce the polluter pays principle (Bailey, 2004). The system was completed in 2006 and the pilot phase began in 2007 (Waste Discharge Charge System; Status and Progress to date, 2011).

Once the WDCS is fully implemented, the charges will be payable by any organisation that emits waste directly or indirectly into a water resource (Bailey, 2004).

5.6 Environmental tax earmarking

Another important issue with regards to these environmental taxes is whether or not the environmental taxes collected should be specifically earmarked for environmental projects. This would be an ideal situation, as any revenue generated from the taxing of environmentally harmful endeavours could be ploughed back into more expenditure on environmental research or innovative and environmentally friendly methods of harnessing energy from diverse resources.

It is evident that the South African government does not earmark environmental taxes as it does not like to be limited in its spending decisions. According to Bernard du Plessis, a director for tax Edward Nathan Sonnenbergs, the government needs to be more transparent about how the revenue will be used as well as the benefit of environmental taxation (Government Urged to Earmark Green Taxes, 2011).

5.7 Conclusion

Although the above mentioned sections of the South African Income Tax Act, Customs and Excise Act and South African Civil Aviation Authority are useful, they are not efficient enough to promote the behaviour of environmental awareness that is required from taxpayers. The implementation of comprehensive environmental tax policies in South Africa is long overdue. South Africa has one of the most sophisticated tax systems in the world and it is therefore surprising that no swift steps have been made to put forward comprehensive environmental tax policies similar to those in the US or the UK. However, the Customs and Excise Act is on the right track to being on par with the type of tax policies that are
implemented in the UK. This is evident in the introduction of the fuel levy and the carbon emissions levy.

Chapter 6
Comparison, Recommendations and Conclusion

6.1 Comparison

Data from the OECD (2006) in the figure below (figure 6.1) illustrate the environmental taxes as a share of total taxes generated in each of the most developed countries between 1994 and 2003. The environmental taxes earned are shown as a percentage of that country’s total Gross Domestic Product (GDP). The UK did not rank very high on the list but was consistent in generating environmental revenues between 1994 and 2003. The US ranked last with the lowest ratio of environmental tax revenue to GDP of OECD countries. Perhaps this is because the US only signed and did not ratify the Kyoto Protocol, therefore not committing the US to desired environmental targets. It is also evident from the graph that the UK exceeded OECD standards in achieving a higher percentage of GDP compared to the average rate required by the OECD. The US did not achieve these targets (Fullerton et al., 2008). South Africa did not feature in this study because of its lack of environmental policies at the time in order to give a valid comparison (Fullerton et al., 2008).
Figure 6.1 Environmental taxes as a share of % GDP
Source: Fullerton, Leicester & Smith 2008

Figure 6.2 below illustrates the percentage of environmental taxes collected as a share of total tax revenue. Once again the UK was consistent in generating environmental tax revenue as a percentage of total tax revenue between 1994 and 2003 but it does not have a significant rank on the list. The Nordic countries seem to be more focused on their environmental tax policies. The US featured last on the list once again (Fullerton et al., 2008).

Figure 6.2 Environmental taxes as a share of % total tax revenue
Source: Fullerton, Leicester & Smith 2008
The above graphs can be summarised in the following table relating to the United Kingdom (UK), United States (US) and South Africa (SA):

Table 6.1

<table>
<thead>
<tr>
<th>Countries</th>
<th>Above or below OECD standards</th>
<th>Percentage of GDP</th>
<th>Percentage of total tax revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>Above</td>
<td>+/- 3%</td>
<td>+/- 8%</td>
</tr>
<tr>
<td>US</td>
<td>Below</td>
<td>+/- 1%</td>
<td>+/- 4%</td>
</tr>
<tr>
<td>SA</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

The following table summarises and compares some of the environmental tax policies or acts that have been implemented in the United Kingdom (UK), United States (US) and South Africa (SA).

Table 6.2

<table>
<thead>
<tr>
<th>Implemented</th>
<th>UK</th>
<th>US</th>
<th>SA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel and motor taxes</td>
<td>The UK has a fuel duty as well as a Vehicle Excise Duty (VED).</td>
<td>There is a $0.03 per litre tax on the use of gasoline and a tax incentive for the use of energy efficient vehicles.</td>
<td>The Customs and Excise Act no. 91 of 1964 contains a fuel levy as well as a carbon emissions levy on new vehicles. (However, The carbon emissions levy is not a yearly levy like the UK VED)</td>
</tr>
<tr>
<td>Air passenger taxes</td>
<td>The UK imposes an Air Passenger Duty (APD).</td>
<td>There is a $0.03 per litre tax on the use of jet fuel but no air passenger tax per se.</td>
<td>N/A</td>
</tr>
<tr>
<td>Landfill tax</td>
<td>The UK has a landfill</td>
<td>Certain states impose</td>
<td>N/A</td>
</tr>
<tr>
<td>Levy Type</td>
<td>Description</td>
<td>Current Levy</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>--------------</td>
<td>-------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Aggregates levy</td>
<td>The UK imposed a levy on the commercial exploitation of rock, sand and gravel. The current levy is £2 per tonne.</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Electricity levy</td>
<td>The UK has imposed the Climate Change Levy (CCL), which taxes electricity usage, coal, natural gas and petroleum gas used by businesses. The US offers a tax incentive used to reduce the income taxes of owners of renewable energy projects based on the electrical output of their renewable energy source which produces electricity.</td>
<td>3.5c per kWh</td>
<td>This levy is included in the price of electricity charged and 3.5c per kilowatt hour is paid by the electricity consumers. This is to compensate for the non-renewable energy source that has been used to generate the electricity.</td>
</tr>
<tr>
<td>Plastic Bags levy</td>
<td>No plastic bag levy. (Only evident in Wales where there is a 5p charge)</td>
<td>N/A</td>
<td>South Africa has a 4c levy per plastic bag. Certain counties are considering a tax on plastic bags while others are banning them altogether. This charge is paid by the plastic bag manufacturers.</td>
</tr>
</tbody>
</table>
### Incandescent light bulbs

- **Incandescent light bulbs**
- No levy but phasing out of incandescent light bulbs.
- No such levy in the US but a future phase out is expected.
- There has been phasing out of filament light bulbs in South Africa. The rate of environmental levy per filament is set at R3.

### Incentives for alternative fuels

- **Incentives for alternative fuels**
- No tax incentive perse on using alternative fuels. However, the revenues generated from the Fossil Fuel Levy are used to contribute exclusively to funding the development of alternative energy sources.
- The US federal government provides tax credits for ethanol along with other alternative fuels. Ethanol enjoys the largest tax incentive among alternative fuels.
- Section 12B of the Income Tax Act allow deductions in respect of certain machinery, plant, implements, utensils and articles used specifically for the production of bio-diesel or bio-ethanol.

### 6.2 Recommendations

According to Professor R. Mann of University of Oregon, a tax policy solution to prevent further global warming consists of 3 key strategies:

- Ending the current subsidies for fossil fuels
- Enforcing a carbon tax on CO₂ emitting industries
- Using incentives to address and reduce CO₂ emissions (Mann, 2002).

These strategies should be applied in South Africa to assist its progression in implementing comprehensive environmental taxes. However, they are not entirely applicable. South Africa currently does not subsidise the fossil fuel sector unlike the US which is still doing so.
Renewable fuels receive large tax incentives in the US. As mentioned in Chapter 4, a significant portion of US energy supply is made up of renewable energy. The largest portion of renewable energy is biomass (52%), hydroelectric (34%), wind (7%), geothermal (5%) and solar (1%) (Mann, 2002).

As South Africa is a resource-rich country, these renewable sources can easily be obtained here. Biomass (animal and vegetable derived material) is converted into liquid fuel. South Africa has an abundance of wildlife and vegetation and obtaining biomass would not be a concern. Hydroelectric power was already producing 1 billion kilowatt hours by 2006 (South Africa Hydroelectric Power Production by year, 2011). Wind and solar energy are also in abundance in South Africa where the sun shines most of the year and there are areas of strong wind activity.

The South African government should make use of tax incentives in order to promote the harnessing of these alternative energy sources.

As seen in Chapter 3, the following taxes are the most prominent in the UK: Fuel and Motor Taxes and Air Passenger Duty (APD).

In the UK, a Vehicle Excise Duty (VED) is levied on cars registered after 1 March 2001 based on the emissions rating of the vehicle purchased. In 2006, an enhanced system of VED was approved and announced in the budget. This system of ‘graduated’ VED (GVED) has made adjustments whereby it will not charge an emissions tax on vehicles which emit 100g or less CO$_2$ per kilometre driven and it will charge a new higher rate for high CO$_2$ emitting vehicles (if they are more than 226g per kilometre) of £210 per year (Fullerton et al., 2008).

In South Africa the roads are getting busier by the day. According to November 2010 figures from the Arrive Alive campaign, there are over 9.7 million cars on our roads (How many vehicles are in South Africa November 2010, 2011). There are enough incentives for a Vehicle Excise Duty (VED) to be implemented in South Africa. South Africa imposes a similar levy known as the Carbon Emissions Levy under the Customs and Excise Act (as seen in chapter 5). However, this levy is only charged on a once-off basis and is included in the purchase price of the vehicle. It is not a yearly levy such as with the Vehicle Excise Duty imposed in the UK and is therefore not as effective in generating large tax revenues. A yearly carbon emissions levy on all road vehicles in South Africa should be considered. The taxi industry in South Africa plays an extremely important role in the economy as many South
Africans rely on the public transport to get to work. Minibus taxis and buses make up 85 percent of the public transport in South Africa (Minibus Taxis and Road Safety, n.d.).

In the budget on 21 March 2012 the UK Government stipulated that Air Passenger Duty rates would increase by double the inflation rate from 1 April 2012. It is charged on a per person per flight basis and it varies according to class, ticket and the minimum distance in miles from London. The Office of Budget Responsibility (OBR) anticipated revenues from APD of £2.7 billion for 2011-2012. There are two rates: a reduced rate for economy class and a standard rate for premium classes (Fullerton et al., 2008). South Africa should consider charging an APD on its local as well as international flights. It would most certainly result in passengers thinking twice about making their trips as a result of the inflated price and it would stimulate environmental consciousness.

Although there have been shifts to environmental considerations in South Africa as mentioned in Section 12 of the Income Tax Act, it is still very limited and too vague. There is a dire need for a comprehensive environmental tax policy in South Africa. The most effective environmental policies would be a combination of the US and the UK policies. There are many environmental tax policies to consider for South Africa, each with their corresponding tax incentives. It is up to the government to take the initiative to implement the environmental policies that would be appropriate in the South African context.

After taking into account the various policies and acts in the US, UK and South Africa as discussed in previous chapters and the comparison of these three countries, it can be seen that the UK has the most comprehensive and effective environmental tax regime. Perhaps this is because it was the first country of the three countries examined to implement a form of environmental levy in the 1850s. The US follows only because of its many proposed policies that have been set forth by congress and since the US has not ratified the Kyoto Protocol, it can only be assumed that the US is not as serious about addressing the global warming issue as other Kyoto Protocol member countries. There is little proof that the proposed policies would work in the US, however they are plausible policies and in time could prove to be very effective if implemented in South Africa.

6.3 Conclusion

As seen from the information gathered in this study, the most successful tax policies are those which are economically viable and simple to control. This is achieved through effective
implementation by tax authorities as well as taxpayers’ willingness to adhere to these policies. It is imperative that the countries with established environmental tax policies encourage certain environmental standards which will in turn make it easier for developing countries to follow by example.

It can be concluded that tax policies are effective tools in assisting in the prevention of further global warming. The most effective way to achieve environmental consciousness is by implementing tax systems that use economic means to achieve social change. However, the reason behind the implementation of these policies must not only be economic, but ethical as well (Mann, 2002).

The ever-increasing threat and the consequences of global warming are becoming more apparent and the need for immediate action and policy implementation by all countries as a preventative measure cannot be advocated enough. It is ironic that the words echoed by Mr Gandhi so many decades ago are more than ever appropriate in the present day. “What we are doing to the forests of the world is but a mirror reflection of what we are doing to ourselves and to one another.” (Gandhi, n.d.).
References


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