

# Environmental Taxes: Feasibility Investigation

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# Executive Summary

In April 2015 the States resolved to:

*“Direct the Treasury and Resources Department, after consultation with the Environment Department, Social Security Department, Commerce and Employment Department and Policy Council as appropriate, to lay before the States no later than March 2016 proposals to diversify the tax base by introducing or increasing environmental taxes, and to agree that a comprehensive energy efficiency programme to assist in mitigating any possible regressive effects of such taxes on low income households should form an integral part of such diversification (Resolution on Billet D’Etat IV, made in April 2015).”*

This research report is intended to be a first step in progressing this resolution.

An Environmental Tax is defined as ‘a tax whose base is a physical unit (or a proxy of it) that has a proven negative impact on the environment.’ These taxes are primarily designed to promote environmentally positive behaviour, reduce damaging effects on the environment and generate revenue that can potentially be used to promote further environmental protection.

In line with the spirit of the resolution, Environmental tax reforms (ETR) can be used to shift the burden of taxes from conventional taxes such as labour to environmentally damaging activities, such as resource use or pollution. In this way, they are typically revenue-neutral. However whilst encouraging sustainable practise, the effects of the tax on competitiveness, their distributional effects on households and their public acceptability must all be considered if the tax is to be successful as both an environmental and revenue management tool.

Environmental taxes can be split into four main categories, those that tax: energy, transport, pollution or resources. The total revenue from environmental taxes in the EU-28 in 2014 was €343.6 billion; this figure equates to 2.5 % of gross domestic product (GDP) and to 6.3% of the total revenues derived from all taxes and social contributions. In the UK in 2014, environmental axes raised £44.6 billion and include an aggregates levy, landfill tax, a carbon price support mechanism, vehicle excise duty based on vehicle emissions and a climate change levy which taxes energy use.

In Guernsey, environmental taxes have not, until recently, been used as a means for addressing environmental damage or as a source for generating revenue or diversifying the tax base. Their use in the ‘First Registration’ Duty for motor vehicles has been the first use of environmental measures to levy a charge on an environmentally damaging activity. Beyond this, traditional use of taxes and charges to provide revenue for services has been the norm. While Guernsey applies taxes that might be considered “environmental taxes”, such as motor fuel duty, the environmental impacts were typically not the motivation for their introduction and have not been factored into these in any significant economic sense.

Based on evidence on their usage within other jurisdictions, a number of options for using environmental taxes were explored in this research paper.

**Table 1: Summary of Environmental Tax Options & Possible Revenues in Guernsey**

Environmental Tax	Summary	Viability	Est. potential revenue
Vehicle Emissions Tax	<ul style="list-style-type: none"> <li>• Tax based on emissions of vehicles.</li> <li>• Already implemented within the UK &amp; Jersey</li> <li>• Risk of duplicating vehicle taxation, if current motor fuel duty is not rebranded to remove continued reference to 'motor tax element'.</li> <li>• Does encourage the use of lower emissions cars, which may in turn decrease fuel demand.</li> <li>• Does not necessarily reduce actual vehicle use or numbers</li> </ul>	<p>Viable</p> <p>Relatively low revenue, experience in Jersey shows less than predicted.</p>	<b>£500,000</b>
Increasing & Extend Motor Fuel Duty	<ul style="list-style-type: none"> <li>• Options to increase fuel duty or rebalance levy where there are concessionary rates.</li> <li>• Removal or narrowing of exemptions should be considered, particularly in regard to marine fuels.</li> <li>• Administratively less demanding as legislation is already in place.</li> <li>• Fuel demand is unlikely to decrease significantly, creating a stable tax base.</li> </ul>	<p>Most viable</p> <p>Removal of exemptions will increase revenue.</p> <p>Relatively stable</p>	<p><b>Options of: £80,000 - £900,000</b></p> <p><b>Most feasible: £700,000</b></p>
Energy/ Carbon Tax	<ul style="list-style-type: none"> <li>• Tax on carbon content of fuel and therefore emissions.</li> <li>• Two-tier system could be used, with a higher rate for motor fuels in order to further encourage a reduction of vehicle use and address traffic concerns.</li> <li>• This tax would replace that of current motor fuel duty, although would not necessarily increase it.</li> <li>• Introduction of tax on electricity &amp; gas would see an increase in household bills.</li> </ul>	<p>Reasonably viable.</p> <p>Needs investigation of level of tax appropriate and whether increase in household bills is tolerable.</p>	<b>£2,200,000*</b> (increases or removal of exemptions in fuel duty may be used in conjunction)
Water Tax	<ul style="list-style-type: none"> <li>• Flat rate applied to the unit charge of water.</li> <li>• Encourage reduced water consumption</li> <li>• Unlikely to receive public support as Island does not suffer regular water shortages.</li> </ul>	<p>Revenue is not significant.</p>	<b>£50,000</b>
Non- Renewable Waste Disposal Tax	<ul style="list-style-type: none"> <li>• Tax based on weight or proportion of recyclables/non-recyclables produced.</li> <li>• Current system based on TRP does not reflect individual household recycling rates.</li> <li>• Any flat rate tax based on this would be inappropriate, dis-incentivising recycling and unfairly burdening lower income households.</li> <li>• Tax could only be introduced if a per kilo or quantity of refuse type system were introduced.</li> </ul>	<b>Strategy already being developed to address refuse collection, based on refuse type.</b>	

\*This total is likely to be an over-estimate as it was not possible to break down the quantity of gas oil by fuel class or use, and so this revenue may overlap with revenue from other fuel types. Further investigation would likely reduce revenue from gas oil stated, see appendices (*Methodology & Calculations*).

## What Next?

The following lines of investigation were identified based on those options which were deemed most viable for Guernsey:

- Investigate the introduction of a tiered carbon tax, with a higher levy (equivalent to that of current motor fuel duty) for motor fuels, and lower for electricity and other uses.
  - The tax would replace the current motor fuel duty, which would be abolished (therefore there would be no change in end cost to the customer).
  - A distinction in rates between domestic and non-domestic use, again with possible differing rates, or even an exemption for domestic use should be investigated.
- Investigate the possible introduction of a Vehicle Emissions Duty, equivalent to that of the UK.
- Investigate how fuel duty exemptions could be narrowed and fuel duty increased for marine and non-road based use.

## Table of Contents

<b>Executive Summary</b> .....	<b>2</b>
<b>What Next?</b> .....	<b>4</b>
<b>Introduction</b> .....	<b>7</b>
<b>Background</b> .....	<b>8</b>
<b>What is an Environmental Tax &amp; What are Their Objectives?</b> .....	<b>8</b>
Defining Environmental Taxes.....	8
Environmental Tax Objectives.....	8
<b>Types of Environmental Taxes</b> .....	<b>9</b>
<b>Benefits &amp; Disadvantages of Using Environmental Taxes</b> .....	<b>10</b>
Encouraging Sustainable Practice .....	10
Implications for Households, Distributional Effects.....	10
Diversifying the Tax Base.....	11
Effects on Competitiveness, Goods & Services.....	11
Perception & Acceptance.....	12
<b>Environmental Taxes: Use by Jurisdictions</b> .....	<b>13</b>
<b>UK</b> .....	<b>13</b>
Aggregates Levy .....	13
Climate Change Levy .....	13
Carbon Price Support .....	14
Landfill Tax.....	14
Vehicle Excise Duty.....	14
Air Passenger Duty .....	14
<b>EU</b> .....	<b>15</b>
Netherlands.....	16
Germany.....	17
<b>Jersey</b> .....	<b>18</b>
<b>Environmental Taxes Around the World</b> .....	<b>19</b>
Carbon Tax – British Columbia, Canada .....	19
Water & Waste Water Taxes – Denmark .....	19
Land Use Change Tax – New Hampshire, USA. ....	20
Fishing Tax - Iceland .....	20
Plastic Bag Tax - Ireland.....	20
<b>Environmental Taxes in Guernsey: Present Situation &amp; Potential Application</b> .....	<b>21</b>
<b>Environmental Taxes Already in Guernsey</b> .....	<b>21</b>
First Registration Duty.....	21
Fuel Duty .....	21
<b>Exploring Options for Environmental Taxes in Guernsey</b> .....	<b>22</b>
Transport/Vehicle Emissions Tax .....	22
Increase & Extend Motor Fuel Duty.....	22
Energy/Carbon Tax.....	23

Water Tax.....	24
Non-Renewable Waste Disposal Tax.....	24
<b>Developing Taxes as a Revenue Stream .....</b>	<b>26</b>
<b>Conclusions &amp; Lines for Investigation.....</b>	<b>27</b>
<b>Appendices.....</b>	<b>28</b>
<b>Environmental Tax Categories in More Detail .....</b>	<b>28</b>
<b>Key Elements of a Successful Environmental Tax.....</b>	<b>29</b>
<b>Overview of Environmental Taxes, Charges and Levies in Place in European Countries.....</b>	<b>30</b>
<b>Revenue from Environmental Taxes in Europe .....</b>	<b>31</b>
<b>Energy Tax in the Netherlands.....</b>	<b>32</b>
<b>Examples of Environmental Taxes Around the World .....</b>	<b>33</b>
<b>Comparing UK &amp; Jersey Vehicle Excise Duty Tax Bands.....</b>	<b>34</b>
<b>Guernsey – First Registration Duty Bands .....</b>	<b>35</b>
<b>Methodology &amp; Calculations - Developing Taxes as a Revenue Stream .....</b>	<b>36</b>
Transport/Vehicle Emissions Tax .....	36
Increase & Extend Motor Fuel Duty.....	36
Carbon/Energy Tax.....	39
Water Tax.....	41
<b>References.....</b>	<b>42</b>
Table 1: Summary of Environmental Tax Options & Possible Revenues in Guernsey.....	3
Table 2: Types of Environmental Tax Used in the EU .....	15
Table 3: Energy Tax Charges in the Netherlands .....	16
Table 4: Environmental Tax Investigation in Jersey.....	18
Table 5: Environmental Tax Options & Revenues for Guernsey.....	26
Table 6: Environmental Tax Categories in More Detail .....	28
Table 7: Overview of Environmental Taxes in European Countries .....	30
Table 8: Tax Revenue for EU Countries .....	31
Table 9: Detailed Energy Tax Rates in the Netherlands.....	32
Table 10: Examples of Taxes Around the World.....	33
Table 11: UK Vehicle Excise Duty Bands .....	34
Table 12: Jersey Vehicle Excise Duty Bands.....	34
Table 13: Guernsey First Registration Duty Bands .....	35
Table 14: Increasing Motor Fuel Duty in Guernsey, Scenario 1.....	37
Table 15: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 2 .....	37
Table 16: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 3 .....	37
Table 17: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 4 .....	38
Table 18: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 5 .....	38
Table 19: Guernsey Energy/Fuel Usage, Quantities & Current Duties Levied .....	39
Table 20: Carbon Tax Revenue Potential for Guernsey.....	40

# Introduction

This research paper looks to address the amendment made during the debate on Personal Tax Pensions and Benefits Review, to explore the opportunities to *'diversify the tax base by introducing or increasing environmental taxes'* (Resolution on Billet D'Etat IV, made in April 2015) within Guernsey.

The main objectives of this paper are to provide:

- Background on what environmental taxes are, their objectives and their benefits and disadvantages when implemented.
- An analysis of their application in jurisdictions around the world, including inside and out of the EU
- A brief overview of environmental and pseudo-environmental taxes currently applied in Guernsey
- An initial assessment of the feasibility of the environmental tax options most appropriate for the Island
- A first estimate of the revenue produced by these options
- Recommendations regarding which, if any, options should be investigated further.

Whilst analysing feasibility of environmental tax options, this paper does not go so far as to provide solutions for options which may influence, whether directly or indirectly, other taxes within the Island or economic and social implications resulting from their potential introduction.

# Background

## What is an Environmental Tax & What are Their Objectives?

### Defining Environmental Taxes

The European Statistical Office (Eurostat) define an environmental tax as *'a tax whose base is a physical unit (or a proxy of it) that has a proven negative impact on the environment.'* They are levied on goods and activities directly or indirectly linked to polluting activities.<sup>1</sup>

In 2012, the UK Government defined environmental taxes as those which meet all of the following three principles:

- The tax is explicitly linked to the government's environmental objectives
- The primary objective of the tax is to encourage environmentally positive behaviour change
- The tax is structured in relation to environmental objectives.<sup>2</sup>

The total revenue from environmental taxes in the EU-28 in 2014 was €343.6 billion; this figure equates to 2.5 % of gross domestic product (GDP) and to 6.3% of the total revenues derived from all taxes and social contributions. Across the EU Member States, businesses paid 53% of all energy tax revenue collected by governments, while the contribution of households rose to 45%. The remainder (2%) was paid by non-residents or not allocated.<sup>3</sup>

### Environmental Tax Objectives

Environmental taxes are primarily designed to promote environmentally positive behaviour, reduce damaging effects on the environment and generate revenue. Taxes can directly address the failure of markets to take environmental impacts into account by incorporating these impacts into prices.

If an environmental tax is aimed primarily at achieving environmental benefits, the emphasis will be on the regulating impact and behavioural response.<sup>4</sup> In this way, it should be designed with the objective of progressing towards environmental targets, for example reduction in carbon emissions in line with the targets set in the Kyoto and subsequent agreements. This does require an adequate estimation of the behavioural response, as the stronger this response (i.e. the higher the elasticity of supply and/or demand to the tax), the stronger the regulating effect. This also implies lower revenues in the longer term than at their introduction.<sup>5</sup> With every step towards achieving the environmental target the tax revenue will decrease as the use of the discouraged goods or activities reduces in

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<sup>1</sup> Eurostat (2016a)

<sup>2</sup> HM Treasury (2012)

<sup>3</sup> Eurostat (2016b)

<sup>4</sup> Kosonen & Nicodème (2009)

<sup>5</sup> OECD, (2011)



response to the tax. **There is, therefore, a trade-off between tax revenue and the environmental goal, and, if successful in achieving its environmental goals, this will not generate a stable long-term source of tax revenue.**<sup>6</sup>

Environmental tax reforms (ETR) have been used within the EU, in different forms, to shift the burden of taxes from conventional taxes, such as labour, to environmentally damaging activities, such as resource use or pollution<sup>7</sup>. In this way they aim to increase the efficiency of resource use and increase environmental sustainability, whilst reducing other taxes, typically so that the policy is revenue neutral overall.<sup>8</sup> When considering such a “revenue neutral” policy it is important to consider both the short and long term revenues of the tax and the behavioural response to its application.

Alternatively tax revenues may be directed towards the development of environmental projects or initiatives, such as renewable energy development. This approach is very common, examples include the UK Aggregates Levy used to fund a ‘Sustainability Fund’ for quarry restoration projects, and Germany’s Renewable Energy Act surcharge, used to support renewable energy providers, both described in this paper.

## Types of Environmental Taxes

Environmental taxes can be split into four main types: energy; transport; pollution and resource.

Energy (e.g. coal, oil products, natural gas and electricity) taxes comprise the majority of environmental tax revenue (72.9% in the UK, 2014).

Transport taxes consist mainly of taxes related to the ownership and use of motor vehicles, although taxes on other transport and related transport services are also included. In 2014, transport taxes contributed 23.7% of all environmental tax revenue. Motor vehicle taxes paid by households made the most important contribution, accounting for 47.6% of total transport tax revenue in 2014.

Pollution and resource taxes include taxes on the extraction of raw materials and on the management of waste. Only 3.4% of total environmental tax revenue comprised pollution and resource taxes in 2014. Landfill tax made the largest contribution to pollution and resource taxes. In 2014, this tax generated £1.1 billion in revenue, representing 75.8% of all income from pollution and resource taxes.<sup>9</sup>

A more detailed breakdown of these tax categories is included in the appendices (Table 6).

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<sup>6</sup> Vollebergh (2014)

<sup>7</sup> EEA (2005)

<sup>8</sup> Ekins et al. (2011)

<sup>9</sup> Office of National Statistics (2015)

## Benefits & Disadvantages of Using Environmental Taxes

The Organisation for Economic Co-operation & Development (OCED) identifies a number of issues that an environmental tax should address when implemented. The key points are addressed below but a full list can be found in the appendices (*Key Elements of a Successful Environmental Tax*).

### Encouraging Sustainable Practice

Environmental taxes are used to discourage the use of activities that have a negative effect on the environment, or to at least ensure that polluters pay for such activities in a measured and fair manner.<sup>10</sup> They place environmental impact in an economic context that can be financially identifiable to the user, provoking action due to the realisation of cost savings.

Environmental taxes also force a shift towards more sustainable methods, particularly within the production of goods and services. If effective, taxes should provoke a change in behaviours encouraging the use of less energy intensive or polluting practices or use of renewable energy sources. It also encourages business to innovate as they invest in new technologies and methods of abatement, giving them the flexibility to achieve compliance how they see fit.

In addition taxes are a far more effective at exploiting the entire range of emissions reduction opportunities than regulatory approaches.<sup>11</sup> They are relatively efficiency in application as well as being a typically cost effective mechanism to implement over regulatory measures although secondary effects and their costs/benefits should still be considered.

### Implications for Households, Distributional Effects

There is substantial evidence<sup>12</sup> that increases in environmental taxes can be regressive, meaning that they fall disproportionately on low-income households, because these groups spend a relatively high proportion of their income on domestic energy. This can affect the political feasibility of ETRs and therefore it is crucial that policy makers understand these implications and implement measures to address this.

This unequal distribution is often addressed through revenue recycling in which users are 'reimbursed' in some manner, typically through cuts in personal and/or corporate income taxes, or exemptions. It is crucial that revenue recycling occurs in a manner that is fair and targets those at greatest risk<sup>13</sup>. Therefore a number of factors must be considered in any ETR, including the sustainability of employment levels for sectors where the new tax has most impact, the impact on different households

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<sup>10</sup> O'Riordan (2014)

<sup>11</sup> Heine et al. 2012

<sup>12</sup> See OECD (1995), Speck (1999), Speck et al. (2006), Leipprand et al. (2007), Serret and Johnstone (2006).

<sup>13</sup> Johnstone & Alavalapati (1998)

as well as the indirect costs that may result within other sectors e.g. loss of duties or other taxes from decreased demand.

## Diversifying the Tax Base

Within the EU, the revenue raised by environmental taxes have been used as part of wider reforms that aim to shift the tax burden away from current sources as a part of broadening the tax base, in similar way to the approach outlined in the States resolution which initiated this report. Often revenue is used to reduce distorting taxes such as those on labour (e.g. social security contributions) and in this way the tax is budget-neutral<sup>14</sup> with such revenue recycling being critical for their success.<sup>15</sup>

Further to this, in some instances ETRs may result in a 'double dividend'<sup>16</sup> in which the introduction of the tax results in environmental benefits and also wider non-environmental ones as well. A very simple example may be that the reduction in labour taxes, as discussed, having a positive impact on employment. The existence of a double dividend is wholly dependent on the individual circumstances in which they are introduced and the levels to which any negative impacts are mitigated. In reality, the assumption that reducing labour taxes would lead to higher employment, is an oversimplification, particularly in a jurisdiction like Guernsey where employment rates are already very high. The broad and indirect impacts that an ETR may have, will not necessarily translate to positive economic outcomes. A double dividend effect is in no way a guarantee and should not be assumed within any ETR.<sup>17</sup>

**However it is clear that use of environmental taxes can be used to diversify the tax base and create a more stable environment for government revenue, reducing dependency on single sources, but only if the significant distributional effects (changes to welfare, competitiveness, prices of goods and services) are managed sufficiently.**

## Effects on Competitiveness, Goods & Services

By seeking to reduce polluting behaviours, environmental taxes alter production decisions. Changes or high rates of environmental taxes will inevitably force businesses to reanalyse costs, particularly in sectors that use high levels of energy (the most significant area where such taxes have impact) in the production of goods or services. Increases in costs of production may be passed on to the customer, reducing the competitive nature of the business, or force them to move to a jurisdiction with lower rates of tax. Any jurisdiction looking to undertake any tax reform should consider the impact of such changes on GDP and business related tax, as well as wider economic, social and employment consequences.

In Guernsey, the businesses likely to be most affected by increases in energy costs in particular tend to be largely domestic in nature. There is, for example, little manufacturing activity in Guernsey which

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<sup>14</sup> COMETR (2007)

<sup>15</sup> Ballad (2015)

<sup>16</sup> Goulder (1995)

<sup>17</sup> Ballard (2015)

might choose to relocate in response to an environmental cost. **An increase in consumer costs in areas such as construction or the impact of the overall viability of light industry business is likely to be more of an issue.**

## Perception & Acceptance

Public acceptance of any new tax can be difficult, personal and business taxes remain topical issues within many jurisdictions and the fairness of their implementation is often debated. Environmental taxes are no exception, not only must the tax be broad enough to encompass all users, a disproportionate impact on vulnerable individuals will likely render them politically difficult to introduce. In this respect, a clear reasoning and balanced approach is needed to encourage public support of the tax. This support is critical and has previously been the most difficult step of such tax reforms. Common points raised by the public include:

- i) 'A lack of knowledge about the overall scheme;
- ii) Scepticism about governments using the funds to reduce other taxes and instead feeling that ecological tax reform was a guise to generally increase taxes;
- iii) The connection between the introduction (or augmentation) of environmental taxes and reduction in other taxes was perceived as not necessarily appropriate;
- iv) According to taxpayers, the revenue should be used for environmental purposes.'<sup>18</sup>

The general public tends to miss the incentive effect of carbon taxes, thus expecting tax revenues to be earmarked for environmental purposes. When this is not the case, most people feel that carbon taxes are just a pretext to raise fiscal revenues.<sup>19</sup> When tax revenues are earmarked for other purposes, the general public is generally disconcerted about the possibility of using the revenues of an environmental tax for something unrelated to the environment.<sup>20</sup> **This is the fundamental challenge of environmental tax reforms, particularly if the initial incentive for their introduction was to fulfil a budgetary need, rather than an environmental purpose. Therefore considerable transparency is needed in order to gain public support and fundamentally ensure that the tax is successful.**

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<sup>18</sup> Baranzini, A & Carattini, (2016)

<sup>19</sup> Baranzini, A & Carattini, (2016)

<sup>20</sup> Saelen & Kallbekken (2011)

# Environmental Taxes: Use by Jurisdictions

## UK

- Environmental taxes raised £44.6 billion in the UK in 2014.
- Environmental tax revenue has remained broadly stable as a percentage of GDP (2.5% in 2014).
- They provided 7.5% of all revenue from taxes and social contributions in 2014.
- Hydrocarbon oil duties (including transport fuels) accounted for 60.8% of all environmental taxes in 2014.
- Households paid an average of £765 in environmental taxes in 2012.

(ONS, 2015)

The main environmental taxes implemented in the UK are as follows:

### Aggregates Levy

This tax is currently payable on the commercial exploitation of primary sand, gravel and rock (with some exceptions). Funds were recycled through a cut in employers' National Insurance contributions (NICs) and a new 'Sustainability Fund' that provided grants for sustainable/environmental projects. The levy has been successful in encouraging the use of recycled materials and grants for sustainable projects have been beneficial and seen positive results. However it has decreased competitiveness with overseas aggregate as construction demand continues.<sup>21</sup>

### Climate Change Levy

A tax on the use, by industry, commerce, agriculture and the public sector, of energy including electricity, coal, coke and gas, aimed at reducing greenhouse gas (GHG) emissions. The levy applies to non-domestic users and supply of these fuels. It is not a tax on electricity generation as this is covered by the Carbon Price Support (CPS) tax detailed below, but looks at 'supply'. All other fuel uses including motor fuels and those used for heating are included in a separate fuel duty (which is not deemed an environmental tax).

The Summer Budget of 2015 removed the exemption for renewable energy, which the Government stated would provide an additional £490 million for 2015/16 in revenue.<sup>22</sup> However this has reduced income for renewable energy companies/developers and therefore has disadvantaged, and in some respects halted development of this sector.

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<sup>21</sup> Seely (2011)

<sup>22</sup> HM Treasury (2015)

## Carbon Price Support

The Carbon Price Support (CPS) mechanism was brought in to help decarbonise the electricity sector and targets electricity generation. The mechanism creates a carbon price per tonne by setting a trajectory for a total carbon price for UK power sector participants. This means that there is a carbon tax on top of the EU Emissions Trading Scheme price to create a pre- defined total carbon price. The CPS is currently set at £18 per tonne of CO<sub>2</sub>. It was estimated that the tax would raise £3.2 billion from 2013<sup>23</sup>, although reforms in the tax cap have adjusted this.

*Note: The EU Emissions Trading Scheme is a mechanism introduced in 2005 that puts a cap on the CO<sub>2</sub> emitted by business and creates a market and price for carbon allowances.*

## Landfill Tax

This tax aims to encourage businesses to use alternative forms of waste management and produce less waste. It is payable by businesses and local authorities when they dispose of waste at a landfill in addition to landfill fees. Current charges are: Standard rate: £84.40 per tonne, lower rate (for inert or inactive waste): £2.65 per tonne.

## Vehicle Excise Duty

A tax based on carbon emissions (g/km) for a vehicle. VED increases the annual running costs of owning a car. It uses a number of rates or bands according to the CO<sub>2</sub> emissions of the vehicle (see appendices, Table 11). Lower emissions incur a lower rate and therefore the intention is that individuals will purchase these lower emissions vehicles, the current rate is from £20 - £515 per year. There is therefore a reasonable cost saving to be made with the purchase of a lower emissions vehicle. However this tax does little to reduce actual car numbers as it is not so large as to change behaviours and therefore individuals are not dissuaded from owning or purchasing a vehicle.

The duty is being reformed in 2017 to introduce a first year rate for those vehicles first registered from 1<sup>st</sup> April 2017 onwards. Thereafter an annual flat rate fee of £140 per year will be charged. The first year rate increases based on emissions and can be as much as £2000. This increases the duty paid by high emissions cars, with the intention of ensuring these owners pay a greater share. For those vehicles first registered before April 2017, the system will not change.

## Air Passenger Duty

A tax on air travel based on distance of travel, when leaving the UK. This tax has been used to increase revenues, and environmental benefits from APD are secondary. The tax does not have a strong effect on emissions, in fact with recent changes in payment structure, whilst it may discourage flying, its use does not correlate directly with reducing emissions overall.

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<sup>23</sup> Scottish Government (2015)

## EU

Environmental taxes are used extensively throughout the EU, in a variety of ways and to address a number of environmental areas, detailed below:

**Table 2: Types of Environmental Tax Used in the EU**

Environmental Area	Examples of Instruments	
Energy	Nuclear fuel tax Energy tax	
Water Stress and availability	Water abstraction charges Water pricing Water trading	Payments for ecosystem services (PES) Regional water board levy
Water quality, pollution	Waste water charges/ wastewater treatment levy Pesticide taxes	Fertiliser taxes Groundwater levy
Air pollution and GHG emissions	SO <sub>2</sub> taxes NO <sub>x</sub> taxes Particulate matter taxes	Aviation/air ticket tax Carbon tax Road fuel tax
Waste management & products	Landfill taxes Incineration taxes Packaging taxes	Pay-as-you-throw (PAYT) schemes Plastic bag tax Tax on disposable cutlery
Materials	Natural resources taxes Aggregates taxes	
Biodiversity	Pesticide taxes Fertiliser taxes	Stumpage fees Wildlife and hunting fees

Source: IEEP (2014)

These taxes have had varying degrees in success, dependent on their proper management, a clear understanding of their direct and indirect effects, as well as their use alongside other policy instruments. As it will be made clear below, the majority of these taxes have been primarily implemented for environmental purposes and are often therefore revenue neutral. Such taxes have been used to varying degrees by different countries, with the most common taxes being on transport, energy, and water. Table 7 in the appendices details the taxes by category, implemented in each country as of 2014. A significant level of revenue is made in the EU from environmental taxes, however, most were introduced as revenue neutral measures and were offset by reductions in other forms of taxation. Table 8 in the appendices shows that in total EU countries made €343,641 million in 2014.

## Netherlands

At present about 10% of total tax revenue in the Netherlands comes from environmental taxes. This is one of the highest rates within the EU. Environmental taxes largely consist of energy and water usage taxes.

### Energy Tax

The Netherlands levies energy taxes on the combustion of natural gas and the consumption of electricity and mineral oils (see Appendices, Table 9). Tax rates are higher for smaller household users than large industrial ones (see below). This is in part due to the existence of the EU Emissions Trading Scheme which regulates CO<sub>2</sub> emissions from large industrial installations and power plants, with the aim of reducing these by 21% by 2020.<sup>24</sup>

**Table 3: Energy Tax Charges in the Netherlands**

	Households (€)	Services & other (€)	Industry (€)	Agriculture (€)
Natural Gas	5.3	3.5	0.7	0.8
Electricity	14.3	3.8	0.9	11.2
Petrol	22.7	22.7	22.7	22.7
Diesel	12.3	12.3	12.3	12.3
LPG	4.0	4.0	4.0	4.0

Source: PBL (2014)

Note: Figures provided are charges in Euros per unit of energy (GJ – gigajoules), NOT percentage rates of tax.

To stimulate self-generation from renewable energy sources, households and other small users are exempt from the energy tax if electricity is generated through such methods, such as using solar panels.<sup>25</sup>

The current energy tax structure in the Netherlands is relatively stable. Although taxes on electricity and natural gas for heating more ordinarily evoke a behavioural response, heating demand remains stable and electricity demand within the country overall has increased. In this way the energy tax structure has been used to provide a revenue neutral source, being balanced by tax reductions elsewhere.

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<sup>24</sup> European Commission (2016)

<sup>25</sup> Vollebergh (2014)



## Water Tax

Businesses and households in the Netherlands pay a tap water tax and VAT (6%), these are incorporated into the drinking water rate. Water companies pay provincial groundwater levies. There is also a tax for installations on public land or water.

On average, the water taxes constitute 23.4% of the total drinking water consumer (business & households) price. The tap water tax alone was 33.3 cents (28p) per m<sup>3</sup> in 2015.<sup>26</sup>

## Germany

From 1999 Germany underwent an Environmental Tax Reform (ETR) using a number of mechanisms:

- **Electricity Tax** – Tax on electricity consumption, currently around 7%.
- **Energy/fuel taxes** – Increases in taxes on combustion of some fuels and reductions of exemptions.

These were balanced by a reduction in social contributions (to be revenue-neutral) and resulted in a reduction of CO<sub>2</sub> emissions by around 2-3%, reduction in fuel sales and the creation of 250,000 additional jobs.<sup>27</sup>

- **Nuclear fuel tax** – introduced in 2011 and levied on grams of each fuel used.

**The Renewable Energy Act surcharge (levy).** This is the mechanism used to finance feed-in payments that producers of renewable power receive per kilowatt-hour (KWh). The surcharge is levied on all consumers of electricity, with some exceptions. It is used to integrate renewable energy sources into the energy market by increasing their competitiveness. It is adjusted annually and is based on predicted use of renewables by producers in the coming year, the greater the production of renewable energy, the higher the surcharge. It does not form part of governmental central revenue. The levy has been successful, alongside other mechanisms, in increasing renewable energy production within Germany, however does result in an increase in household energy bills.

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<sup>26</sup> Geudens (2015)

<sup>27</sup> Schlegelmilch (2011)

## Jersey

The States of Jersey undertook an analysis of the options for using environmental taxes within the Island to achieve a number of objectives already set out, in 2007. This explored three main topics, energy, transport and waste as areas that could utilise a tax or tax based mechanism in some way to provide the funding required to meet these objectives.

The only recommendation from this study was to introduce a Vehicle Emissions Duty based upon CO<sub>2</sub> emissions, as in the UK. Initially it was estimated that this could raise over £10 million, however re-analysis in 2008 limited this to £5.2 million (£4 million replacing what was being raised by Vehicle Registration Duty, abolished with the introduction of GST).<sup>28</sup> Since the introduction of the tax in 2010, revenue has been much lower than this,<sup>29</sup> with 2015 accounts showing that the tax has only raised £743,000 (and £760,000 in 2014).<sup>30</sup> These options are summarised in the table below:

**Table 4: Environmental Tax Investigation in Jersey**

Subject	Objectives	Actions	Funding needed for objective	Tax options	Potential Tax Revenue
Energy	Reduce GHG emissions. Less dependency on fossil fuels	Energy efficiency Fuel switching Carbon offsets	£7M (£1.4M p.a.)	Energy flat tax Carbon weighted tax	1.4m was required, this could be achieved with a flat rate raise of GST by 1.3%
Transport	Replace VRD revenue Reduce congestion Improve air quality	ITTP package, inc. Public transport	£ 5.5 M	Emissions banded VED Increase fuel duty Parking charges	Initially 10m from VED but since introduction this has proven to <1m
Waste	Reduce volumes Increase recycling	Bring banks Kerbside collection	£1M	Gate fees Bellozanne Household charge	1m was needed, could be achieved

Source: Planning & Environment Department, States of Jersey (2007)

<sup>28</sup> States of Jersey, (2008)

<sup>29</sup> States of Jersey, (2015a)

<sup>30</sup> States of Jersey, (2015b)

## Environmental Taxes around the World

Environmental taxes have been implemented around the world and have seen varying degrees of success. Below are a number of key examples that emphasise the broad scope of environmental areas that they can cover and an indication of what they have achieved in terms changing behaviours. A more extensive list of taxes and brief descriptions, beyond those detailed below, is provided in the appendices (Table 10).

### Carbon Tax – British Columbia, Canada

**Tax based on GHG emissions.** Implemented in 2008 at \$10 per tonne of carbon dioxide but gradually increased to \$30 per tonne by 2012. It will remain at this level for 5 years.

Based on key principles:

- **The tax was revenue neutral.** All revenue was recycled through tax reductions in income and corporate taxes
- **Started at a low rate** giving individuals and businesses time to make adjustments.
- **Low-income individuals and families were protected** – A refundable Low Income Climate Action Tax Credit was designed to help offset the carbon tax paid by low-income individuals and families.
- **The tax has the broadest possible base** – Taxed ALL emissions from fuel combustion.
- The tax was integrated with other measures such as a ‘cap and trade’ system.

The tax is a positive example of carbon taxation, which resulted in moderate impact on emissions and no negative economic impact.<sup>31</sup> The tax was found to be highly progressive even prior to consideration of the revenue-recycling scheme (i.e. reducing of income/corporate taxes), such that the negative impact of the carbon tax on households with below-median income was smaller than that on households with above-median income.<sup>32</sup>

### Water & Waste Water Taxes – Denmark

Denmark has the highest water supply and sanitation prices amongst OECD countries. The water supply tax acts as an incentive to reduce leakage, as providers are required to cover part of the tax if more than 10% of water is wasted through leakages. It raised approximately £151 million in 2011 (0.07% of GDP), well above most other schemes.<sup>33</sup> A wastewater tax on based on discharges content, raising £20 million in 2011. It has been calculated that the real price of water (including environmental taxes) increased by 54% from 1994 to 2004, and this has decreased urban water demand from by 24%. Urban water consumption in Denmark is now one of the lowest in the OECD.<sup>34</sup>

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<sup>31</sup> Rivers & Schufele (2014)

<sup>32</sup> Beck et al. (2015)

<sup>33</sup> Eunomia and Aarhus University (2014)

<sup>34</sup> European Environmental Agency (2013)

## Land Use Change Tax – New Hampshire, USA.

In 1973, a 'Current Use Programme' was established which provides a tax incentive to certain landowners who keep agriculture and forestry land areas from being converted into developments. A tax levy is applied to land owners wishing to change uses or for when the land is being developed. However there are incentives for owners who undertake sustainable practise and good forest management practises. Over 50% of revenues collected by the land use change tax are allocated to conservation funds.

## Fishing Tax - Iceland

Iceland first introduced a resource tax, imposed on fisheries operations, in 2002 due to criticisms that the public was not accruing any benefits from the privatisation of the resource.<sup>35</sup> The tax underwent a reform in 2012 to place a significantly higher levy on fishing companies. It is now comprised of two elements: the standard fee collected to finance the cost of running the fishery, and a special fee designed to capture part of the natural resource rent in fisheries.<sup>36</sup> The revenues from the tax go towards reducing the national deficit.<sup>37</sup>

## Plastic Bag Tax - Ireland

A levy was implemented on the purchase of plastic bags in Ireland. Following its introduction in March 2002, plastic bag use fell from an estimated 328 bags per capita to 21 bags per capita by the end of the year and eventually to 14 bags per capita in 2012.<sup>38</sup> The revenues are earmarked to an environment fund which is used to cover the administrative costs of the levy and to support waste management, recycling centres, litter clean-up and other environmental initiatives.<sup>39</sup> Annual revenues were approximately €23.4 million in 2009 although they went down even further, to €16 million due to the success of the levy in reducing the use of plastic carrier bags, Overall annual revenues have been around one tenth of that initially expected.

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<sup>35</sup> Matthiasson (2008)

<sup>36</sup> IEEP (2014)

<sup>37</sup> Iceland Ocean Cluster, 2012

<sup>38</sup> Lyons (2013)

<sup>39</sup> Convery et al. (2007)

# Environmental Taxes in Guernsey: Present Situation & Potential Application

## Environmental Taxes Already in Guernsey

There is very little in terms of environmental taxes or broad environmental charges within Guernsey legislation currently. Where charges do exist, this is simply a charge for the provision of the service or is used against administration costs and is not applied explicitly to modify behaviours, even if the service does have an environmental element/impact. Further to this, the actual value of the impact on the environment of these services, in most cases, has not been calculated and therefore could not be used to determine the level of any levy if it were implemented. **It is clear from this that a proper valuation exercise would need to be undertaken before a decision to implement any of the tax options discussed in this report could be justified to establish appropriate tax rates.**

Those charges that are already applied in Guernsey and considered environmental or pseudo-environmental taxes are detailed below:

### First Registration Duty

The Duty is based on a motor vehicle's carbon dioxide emissions and uses bands of emissions levels to establish the levy charged. It applies to all 'new' and 'second-hand' vehicles being imported and registered in Guernsey for the first time. 'Low emission' vehicles will be zero-rated and rates are scaled to a maximum levy is £690 for both petrol and diesel vehicles. A number of exemptions apply for service vehicles and other specialised vehicles. Rates and bands are included in the appendices (Table 13). Revenue from this duty was projected to be £1,150,000 in 2016.

### Fuel Duty

Fuel duty comprises two elements, a 'motor tax element' which was used to replace Vehicle tax when it was abolished in 2008, and a 'non-motor tax element' which aligns with the fuel itself. In the 2016 Budget this duty was raised by 6.7p to 58.5p, although this rise was implemented to restore the 'real value of the motor tax element' and was not based on fuel usage or environmental reasoning. **Therefore 'fuel duty' remains in a grey area in regard to its role as an environmental tax, as whilst in principle it is a tax on fossil fuels, it is not based and was not originally introduced to combat environmental damage or reduce use.** The duty has been a long-standing, and socially accepted, revenue source and changes in the levy are based on economic reasoning with this revenue used as part of the central government budget. Fuel duty has been included in this section largely due to its capacity to evolve as an environmental tax if so needed.

## Exploring Options for Environmental Taxes in Guernsey

### Transport/Vehicle Emissions Tax

The use of a Vehicle Emissions Tax, similar to that of the UK, could be an option for diversifying the tax base. Due to the known application of this tax in other jurisdictions, particularly Jersey, it is not unreasonable that to suggest that it could be replicated within Guernsey. However, revenue is unlikely to be high and its potential to have a meaningful impact in balancing a reduction in taxes elsewhere would be low.

Introduction of an annual vehicle tax may prove to be controversial as it was abolished in 2008 and replaced with an increase of fuel duty. There is potential for this to be viewed as double taxation. However it should be emphasised that an Emissions Tax would be based upon environmental damage, whereas the 'motor tax element' of fuel duty indirectly funds, as a revenue source for central Government, the infrastructure needed for these vehicles.

Further to this, the timing of this would be fairly poor with such a recent consultation on the introduction of a vehicle tax and the eventual decision for a First Registration Duty, which came into force in May 2016. However, in reality, the First Registration Duty affects only a small number of users and therefore its ability to curb environmental emissions will be relatively poor.

### Increase & Extend Motor Fuel Duty

Increasing fuel duty may be an alternative option to an Emissions Tax. The 2016 Budget recently increased the duty by 6.7p to 58.5p per litre, in order to restore the real value of the motor tax element. From 2008 to 2015 the fuel based element of the duty has increased by 31.8p, this is substantial in comparison, however retail price still remains lower than that of other jurisdictions such as the UK, which add VAT. This duty raised £17,082,000 in 2015 with the 'motor tax element' accounting for around 60% of this. Therefore motor fuel duty could be increased to better reflect carbon emissions in a simulated carbon tax methodology (although not so as to result in a decrease of the current retail price, as within the carbon tax example).

Further, in terms of environmental objectives, fuel duty has some merits in that it is directly related to vehicle usage and is proportionate to the levels of carbon consumed, rather than the class of vehicle. In this respect it is clearly tied to environmentally damaging activity and is a stronger incentive for behavioural change. In addition, as this duty is already in place this would require no additional administrative costs and could be a cost efficient option for revenue diversification.

### Removal of Exemptions

Fuel duty is not currently levied on diesel for marine, and other non-road uses, whilst marine petrol is levied at a concessionary rate of 36.6p. From an environmental perspective, marine vessels are damaging in a number of ways, through direct pollution (oils & fuel entering the marine environment), GHG emissions and release of toxic gases, as well as impacts associated with use such as physical disturbance and damage of marine ecosystems and depletion of fishing stocks.

It is accepted that the use of vessels is far lower than that of cars in Guernsey, however it is not inappropriate to utilise the rate of fuel duty as a proxy for environmental impact, and in doing so, include marine use. That said, a universal increase in the duty for ALL marine use would not be appropriate or recommended as the risks this would place on commercial use are not known and would need investigating. Therefore an increase in duty for non-commercial vessels only should be considered. In all of the possible fuel duty options (both road and non-road use) this is likely to be the most feasible as it carries lesser risk, whilst re-enforcing the 'polluter-pays' principle.

In addition, as there is not currently a duty on fuels used for aviation this could be introduced under the same rhetoric as marine use, predominantly due to significant levels of GHG emissions produced by this use. However, in order to preserve competitiveness in the market, again this would not be for commercial use, as no duty is applied within the UK, or EU, except for that used for private aircraft. It is also unlikely that an aviation duty of any sort would be viable, as it would be politically and socially undesirable and could have extensive indirect impact.

## Energy/Carbon Tax

The implementation of a carbon tax in the Island has been discussed previously in a consultation document in a joint review by the Social Security and Treasury and Resources Departments in 2013. This showed that a tax of £121 per tonne of carbon would result in a net increase in revenues of approximately £20m. However this tax would have varying effects on the different uses of fuels/energy. In the case of motor fuels, if applied consistently across all fuel types and was used to replace existing duty, it would actually result in a decrease of cost per litre. At the same time it would increase a household's total fuel and electricity costs by an average of around £320 a year.<sup>40</sup>

Applied to its full extent, a carbon tax would replace the current motor fuel duty, although would not need to see a decrease in motor fuel costs, as in the 2013 workings, as this would reduce the projected revenue. To avoid a reduction in the duty on motor fuels this could be applied as a tiered tax, with higher rates applied to motor fuels per tonne of CO<sub>2</sub> than other uses, reflecting the additional impact of infrastructure and land use requirements of motoring. In addition differing rates could be applied to those energy sources that are most polluting such as coal, which would attract heavier taxation than cleaner alternatives, to more fairly reflect environmental damage.

The extension of the 20% corporate income tax rate to 'the importation and/or supply of hydrocarbon oil or gas in Guernsey' in the 2016 Budget, targets wholesalers and may have implications for those households using gas and oil, based upon the actions of the providers, who will incur additional costs. The tax is not intended to affect electricity generation. The 2016 Budget states that this will '*align Guernsey with the tax position in Jersey and is estimated to raise additional income of £350,000 per annum*'.<sup>41</sup>

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<sup>40</sup> States of Guernsey (2013)

<sup>41</sup> States of Guernsey (2015)

In regard to electricity use, a carbon tax would aim to reduce demand through more efficient use or increased use of renewable energy sources. However without a cost effective renewable alternative or incentives for increasing household efficiency (e.g. for insulation, water efficiency, heating) the customer may feel that they are being unfairly charged for not using renewable energy or reducing their bills, even though they may be willing but unable to do so. At an Island-wide level a reduction of carbon use would predominantly occur through use of connections with France (via Jersey). Within this agreement 30% of energy is derived from renewable sources. Any further increase would require a renegotiation of this arrangement and would not necessarily decrease costs to the customer, since the reduction of the carbon intensity would be offset by an increase in the import cost. As it stands, Guernsey Electricity are mandated to provide electricity at lowest possible cost and therefore a move towards possibly more expensive renewable sources, would not be in line with this. However, a tax, if incorporated within the definition of 'lowest cost' may shift the cost balance towards typically cleaner import rather than the more carbon intense on-island generation.

## Water Tax

Taxation of water use within Guernsey would look to discourage water wastage and the use of natural sources for activities where it is not essential that treated water be used. This may reduce household demand on water overall and therefore extend upon the duration for which current water storage facilities could supply the Island during periods of low or no rainfall. A significant change in behaviour towards decreasing water use could lead to decreased processing costs for Guernsey Water however an increasing population (and the increased demand that comes with this) would likely overshadow any benefit, unless the change was dramatic.

Fundamentally a water tax within Guernsey would be difficult to justify for environmental reasons alone. The Island does not experience drought often, derives little from ground water stores and has very few natural fresh water sources that are actively depleted by human action. Therefore it is unlikely that demand would decrease significantly. Due to the outlined difficulty in justifying a water tax for environmental reasons, it would therefore be clear that any tax would be for revenue based purposes and therefore would attract significant public attention, even it was part of revenue neutral practice.

## Non-Renewable Waste Disposal Tax

In 2014, 13.2kt (50.9%) of household waste was sent to landfill, 32.3% was recycled and 16.8% was composted via the green waste scheme. Therefore the overall recycling rate (which includes composting) for household waste was 49.1%. This is just below the target set by the EU to recycle 50% of household waste by 2020 and well below a number of jurisdictions, who have already surpassed this including in Austria, with 63 %, followed by Germany (62 %), Belgium (58 %), the Netherlands



(51 %) and Switzerland (51 %).<sup>42</sup> There is clearly room to increase recycling rates and reduce waste going to landfill.

A non-renewable waste disposal tax, in Guernsey, could be used to fulfil that of the Landfill Tax in the UK, with the aim of encouraging households not to put recyclable material in refuse (typically as a part of 'black bag' waste) destined for landfill. However, refuse rates are currently based on the TRP value for the household and therefore bear no relation to the levels of recycling, weight or type of refuse produced. Without variable charges or rebates for households with a high recycling rate, increasing the existing charge would be ineffective and be an unstable base for taxation.

However, proposals for household waste charging mechanisms were approved by the States in December 2014 (Billet D'Etat XXVI) for a flat fixed charge for collection services but that all other costs related to refuse (disposal, recovery, provision of a household waste recycling centre, etc.) be paid through a combination of flat fixed charges and a variable charge per bag for waste and recyclables. This forms part of wider strategy for solid waste proposed in 2014 and currently underway. Therefore as there is already a proposed change to how refuse will be dealt with in Guernsey, this option as an environmental tax is not explored further in this research paper, as these changes should more appropriately address recycling rates within individual households, and how the Island manages its refuse long term.

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<sup>42</sup> EEA (2013)

## Developing Taxes as a Revenue Stream

Guernsey's GDP is £2.4 billion in 2014. Using the average ratio of revenue from environmental taxes within the EU, which was around 2.5%, this equates to a potential £59m for the Island. Total revenue including Social Security Contributions, in Guernsey, was £573 million (£416 million from General Revenue Income & Operating Income, £157 million from Social Security Contributions). Based on the UK's figure of environmental taxes accounting for 7.5% of revenue from all taxes and social contributions, this equates to £42,975,000 of revenue within Guernsey. Both the GDP and revenue figure are considerable overestimates, firstly because it cannot be assumed this is a net gain (GDP may decrease in other sectors due to the taxes), and secondly because there are not the range of opportunities to apply environmental taxes in the Island as in other jurisdictions.

The potential revenues of environmental taxes in Guernsey have been explored. These are summarised below, with details and workings for each tax option/scenario provided in the appendices (titled *Methodology & Calculations*). To contextualise the possible revenues, it is assumed they would be offset by a reduction in revenue/tax elsewhere within the Government budget. If this were the case, as an example, it has been estimated that around £7 million would be needed to raise the Personal Allowance by £1000 in the Island.

**Table 5: Environmental Tax Options & Revenues for Guernsey**

Tax Option		Description	Viability	Est. Revenue
1. Transport/Vehicle Emissions Tax			Most Reasonable	£500,000
2. Increase & Extend Motor Fuel Duty	Scenario 1:	Increase motor fuel duty by 5%	Viable	£900,000
	Scenario 2	Increase marine petrol duty	Reasonable	£80,000
	Scenario 3	All marine diesel taxed	Not viable	See appendices
	Scenario 4	Non-commercial marine diesel use taxed	Most viable	£700,000
	Scenario 5	Introduce aviation fuel duty	Not viable	See appendices
3. Carbon/Energy Tax		Tiered tax on fuels & electricity generation.	Reasonable	£2,200,000 (Does not include revenue from motor fuels, see above)
4. Water Tax		Not viable	Not viable	£50,000

It is clear that only Options 1, 2 & 3 would be viable, as possible revenues may be significant enough to justify further investigation. Within Option 2, Scenario 4 is the most viable and any further investigations should look to narrow exemptions on fuel duty in this way, whereas Scenarios 3 and 5 would not be politically desirable due to their wider economic ramifications. It is likely that the revenue for Option 3 is an over-estimate as it was not possible to break down the quantity of gas oil by fuel class or use, and therefore revenue may overlap with revenue from other fuel types. Further investigation would likely reduce revenue from gas oil stated.

Option 4, a Water Tax, would not yield enough revenue to justify it as a viable option and therefore should not be pursued for investigation.

## Conclusions & Lines for Investigation

Environmental taxes have been implemented successfully in a number of jurisdictions as a part of wider environmental reforms in Government. This has been primarily due to a worldwide drive towards greater sustainable practise as the economic & social consequences of long-term environmental damage become increasingly apparent and costly. Whilst principally utilised to encourage behavioural change (in society, business and the household) to achieve environmental goals and to provide revenue for these, environmental taxes can and have been used to diversify the tax base within a jurisdiction, most commonly as a revenue-neutral instrument. However, such taxes are often regressive in regard to effects on low-income households and may have further indirect implications for other sectors of the economy, and therefore should be implemented in a comprehensive and equitable manner so that they may have a positive net impact on the economy, society and environment.

The ability to implement environmental taxes in Guernsey is limited. Traditional areas for tax such as energy, water and waste are those which attract most public criticism. Whilst an Island with its own unique circumstances, Guernsey faces the inevitable economies of scale for all industries and services, only exacerbated by being an import dependent jurisdiction, and reflected in costs. From this initial research, it has been shown that there is a limited selection of environmental taxes not already under development that could be appropriate within the Island. These options require more significant investigation in order to determine viability and wider impact on the economy and revenue. Suggested lines of investigation are detailed below:

- Investigate the introduction of a tiered carbon tax, with a higher levy (equivalent to that of current motor fuel duty) for motor fuels, and lower for electricity and other uses.
  - The tax would replace the current motor fuel duty, which would be abolished (therefore there would be no change in end cost to the customer).
  - A distinction in rates between domestic and non-domestic use, again with possible differing rates, or even an exemption for domestic use should be investigated.
- Investigate the possible introduction of a Vehicle Emissions Duty, equivalent to that of the UK.
- Investigate how fuel duty exemptions could be narrowed and fuel duty increased for marine and non-road based use.

For all of the above lines of investigation further research should be undertaken into the value of Greenhouse Gas Emissions and environmental damage within the Island so that any taxes appropriately reflect these, and their economic and social impacts.

# Appendices

## Environmental Tax Categories in More Detail

**Table 6: Environmental Tax Categories in More Detail**

Category	Sub-categories	
Energy (including fuel for transport)	Energy products for transport purposes	<ul style="list-style-type: none"> <li>• Unleaded petrol</li> <li>• Leaded petrol</li> <li>• Diesel</li> <li>• Other energy products for transport purposes (e.g. LPG, natural gas, kerosene or fuel oil)</li> </ul>
	Energy products for stationary purposes	<ul style="list-style-type: none"> <li>• Light fuel oil</li> <li>• Heavy fuel oil</li> <li>• Natural gas</li> <li>• Coal</li> <li>• Coke</li> <li>• Biofuels</li> <li>• Electricity consumption and production</li> <li>• District heat consumption and production</li> <li>• Other energy products for stationary use</li> </ul>
	Greenhouse gases	<ul style="list-style-type: none"> <li>• Carbon content of fuels</li> <li>• Emissions of greenhouse gases (including proceeds from emission permits recorded as taxes in the national accounts)</li> </ul>
Transport (excluding fuel for transport)	<ul style="list-style-type: none"> <li>• Motor vehicles import or sale (one off taxes)</li> <li>• Registration or use of motor vehicles, recurrent (e.g. yearly taxes)</li> <li>• Road use (e.g. motorway taxes)</li> <li>• Congestion charges and city tolls (if taxes in national accounts)</li> <li>• Other means of transport (ships, airplanes, railways, etc.)</li> <li>• Flights and flight tickets</li> <li>• Vehicle insurance (excludes general insurance taxes)</li> </ul>	
Pollution	Measured or estimated emissions to air	<ul style="list-style-type: none"> <li>• Measured or estimated NO<sub>x</sub> emissions</li> <li>• Measured or estimated SO<sub>x</sub> emissions</li> <li>• Other measured or estimated emissions to air (excluding CO<sub>2</sub>)</li> </ul>
	Ozone depleting substances (e.g. CFCs or halons)	<ul style="list-style-type: none"> <li>• Measured or estimated effluents of oxydisable matter</li> <li>• Other measured or estimated effluents to water</li> <li>• Effluent collection and treatment, fixed annual taxes</li> </ul>
	Non-point sources of water pollution	<ul style="list-style-type: none"> <li>• Pesticides (based on e.g. chemical content, price or volume)</li> <li>• Artificial fertilisers (based on e.g. phosphorus or nitrogen content or price)</li> <li>• Waste management</li> <li>• Collection, treatment or disposal</li> <li>• Individual products (e.g. packaging, beverage containers, batteries, tyres, lubricants)</li> <li>• Noise (e.g. aircraft take-off and landings)</li> </ul>
Resources	<ul style="list-style-type: none"> <li>• Water abstraction</li> <li>• Harvesting of biological resources (e.g. timber, hunted and fished species)</li> <li>• Extraction of raw materials (e.g. minerals, oil and gas)</li> <li>• Landscape changes and cutting of trees</li> </ul>	

Source: Eurostat (2013)

## Key Elements of a Successful Environmental Tax

The OCED identify the following key elements for designing an environmental tax:

- Environmental tax bases should be targeted to the pollutant or polluting behaviour, with few (if any) exceptions.
- The scope of an environmental tax should ideally be as broad as the scope of the environmental damage.
- The tax rate should be commensurate with the environmental damage.
- The tax must be credible and its rate predictable in order to motivate environmental improvements.
- Distributional impacts can, and generally should, be addressed through other policy instruments.
- Competitiveness concerns need to be carefully assessed; coordination and transitional relief can be effective responses.
- Environmental taxes may need to be combined with other policy instruments to address certain issues.
- Environmental tax revenues can assist fiscal consolidation or help to reduce other taxes.
- Clear communication is critical to public acceptance of environmental taxation.<sup>43</sup>

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<sup>43</sup> OCED (2011)

# Overview of Environmental Taxes, Charges and Levies in Place in European Countries

**Table 7: Overview of Environmental Taxes in European Countries**



Source: IEEP (2014)

## Revenue from Environmental Taxes in Europe

**Table 8: Tax Revenue for EU Countries**

## Energy Tax in the Netherlands

**Table 9: Detailed Energy Tax Rates in the Netherlands**

Energy product	Tax rate <sup>2)</sup>	Exemptions	Climate: EU ETS (CO <sub>2</sub> )	Air quality (SO <sub>2</sub> ; NO <sub>x</sub> ; PM) <sup>3)</sup>
<b>Natural gas</b>				
Small use	Average <sup>4)</sup>	CHP	No	Standards for gas appliances
Large use	Low	Electricity generation CHP/Heat Non-energy use	Yes (emissions)	Standards for power plants (strict) Standards for heat installations
<b>Coal</b>				
Large use	Low	Dual use Non-energy use	Yes (emissions) No	Standards for power plants (strict)
<b>Electricity</b>				
Small use	High <sup>4)</sup>	Net metering <sup>5)</sup> Self-generation <sup>5)</sup> Reduced rates local community <sup>5)</sup>	n/a	n/a
Large use	Low <sup>6)</sup>	Own use of CHP electricity	n/a	n/a
<b>Crude oil</b>				
Oil refinery	None	Yes (entirely)	Yes	Standards for refinery installations
		Non-energy use		
Petrol	Very high	None	No	Engine standards (strict)
Diesel, Passenger transport	High	None	No	Engine standards (strict)
Diesel, Road freight transport	High	None	No	Engine standards (strict)
Diesel, Inland shipping	None	Yes (entirely)	No	Engine standards (moderate)
Kerosene	Low	Yes (aviation)	No	Engine standards (strict)
Heavy fuel oil	High	None	No	Engine standards (weak)

**Table notes:**

- 1) This table focuses on consumption of energy products; for example, electricity consumption is not covered by the EU ETS, but consumption of natural gas and coal for electricity production is.
- 2) Rough indication of tax rate per GJ (see also Section 3.4)
- 3) According to the latest emission standards for installations and engines (e.g. the Euro VI standards for heavy-duty vehicles)
- 4) Taxpayers receive a tax refund to compensate lost income (318 euros per electricity connection).
- 5) This exemption only applies to self-generation of energy from renewable sources (solar and wind) by, for example, community energy cooperatives within a prespecified postal code.
- 6) There is a refund scheme for installations using more than 10 million kWh per year, provided the average tax amount paid is higher than the EU minimum rate.



Source: Vollebergh (2014)

## Examples of Environmental Taxes around the World

Table 10: Examples of Taxes around the World

Case study	Brief description
Air pollution charges in the Czech Republic	Current air pollution charges have been in force since 1992, with the objective to reduce emissions of major pollutants that affect air quality, especially VOCs, and increase efficiency by inducing fuel switching at pollution sources. Revisions in 2013 focused the charges on a more limited number of pollutants (PM, SO <sub>2</sub> , NO <sub>x</sub> and VOC, excluding methane) and introduced higher tax rates.
Tax on polluting activities in France	The Taxe générale sur les activités polluantes (TGAP) was introduced in 1999. It aims to implement the polluter-pays principle and provide a price signal to discourage polluting activities. When introduced the tax covered the disposal of waste, atmospheric industrial pollution and air traffic noise. It has subsequently been extended to cover washing products, insecticide products, waste storage, incineration and single use plastic bags.
Vehicle acquisition fee in France	A bonus-malus system was introduced in 2007 with the aim of stimulating purchases of low-emission vehicles. While encouraging more fuel-efficient vehicles, the system has also led to increased purchase of vehicles and more drivers on roads who are encouraged to travel more.
Air passenger tax in Germany	An air passenger duty came into force in January 2011. The duty is levied on airlines for all passengers departing from German airports. Rates vary depending on which zone the final destination falls within. The main purpose can be considered to be revenue raising, given its adoption as part of a wider package for fiscal consolidation; other objectives include incentivising environmentally- friendly behaviour.
Natural Resources Tax in Latvia	A comprehensive tax covering extraction of natural resources, waste disposal (e.g. household, hazardous, industrial, construction & demolition), products (e.g. oils, batteries), air pollutants CO <sub>2</sub> , SO <sub>2</sub> , NO <sub>x</sub> ) single-use dinnerware, radioactive substances, coal, coke, lignite and water. The tax aims to promote resource efficiency, reduce negative impacts, promote environmentally-friendly technologies and raise revenues.
Energy tax in the Netherlands	The energy tax, previously known as the 'regulatory energy tax', was introduced in 1996. When introduced, the tax aimed to reduce energy consumption with revenues recycled back to the economy. The main purpose of the tax today is to raise revenues; the secondary purpose is to reduce energy consumption.
Pesticide tax in Norway	In 1999, a new pesticide tax system was introduced which is area-based and consists of seven tax bands based on the environmental and health related risks linked to the pesticides. The tax was initially introduced in 1988 as a revenue raising tool; the revision in 1999 reflected a stronger objective of reducing the use of pesticides.
CO <sub>2</sub> tax in Sweden	Sweden was one of the first countries to introduce a CO <sub>2</sub> tax in 1991. The tax was introduced as part of a wider fiscal reform package which included reductions to personal income taxes and environmental taxes including on SO <sub>2</sub> and NO <sub>x</sub> emissions. Since its introduction the overall objective of the tax has changed, from its initial tax-shifting focus towards more environmental protection.

Source: IEEP (2014)

## Comparing UK & Jersey Vehicle Excise Duty Tax Bands

### UK

Table 11: UK Vehicle Excise Duty Bands

	CO <sub>2</sub> emission (g/km)	Single 12 month payment
A	Up to 100	£0
B	101-110	£20
C	111-120	£30
D	121-130	£110
E	131-140	£130
F	141-150	£145
G	151-165	£185
H	166-175	£210
I	176-185	£230
J	186-200	£270
K*	201-225	£295
L	226-255	£500
M	Over 255	£515

### Jersey

Table 12: Jersey Vehicle Excise Duty Bands

Manufacturer's CO <sub>2</sub> Emission Specifications (g/CO <sub>2</sub> /km)	Rate of Vehicle Emission Duty
100g or less	£0
101-125g	£50
126-150g	£150
151-175g	£250
176-200g	£400
201-225g	£750
226-250g	£1,250
251g or more	£1,800

## Guernsey – First Registration Duty Bands

**Table 13: Guernsey First Registration Duty Bands**

NON-DIESEL CLASS VEHICLE'S ESTABLISHED CARBON DIOXIDE EMISSIONS FIGURE (g/km)	NON-DIESEL CLASS VEHICLE'S ESTABLISHED ENGINE SIZE FIGURE (cc) (IF CO <sub>2</sub> FIGURE UNAVAILABLE)	FIRST REGISTRATION DUTY (£)
0 to 110	0 to 1000	0
111 to 130	1001 to 1350	150
131 to 140	1351 to 1500	285
141 to 150	1501 to 1650	420
151 to 165	1651 to 1800	555
166 and over	1801 and over	690

DIESEL CLASS VEHICLE'S ESTABLISHED CARBON DIOXIDE EMISSIONS FIGURE (g/km)	DIESEL CLASS VEHICLE'S ESTABLISHED ENGINE SIZE FIGURE (cc) (IF CO <sub>2</sub> FIGURE UNAVAILABLE)	FIRST REGISTRATION DUTY (£)
0 to 100	0 to 1000	0
101 to 110	1001 to 1150	150
111 to 120	1151 to 1300	285
121 to 130	1301 to 1450	420
131 to 140	1451 to 1600	555
141 and over	1601 and over	690

## Methodology & Calculations - Developing Taxes as a Revenue Stream

### Transport/Vehicle Emissions Tax

As in the UK and Jersey, a Vehicle Emissions Tax could be introduced in Guernsey. Revenue from this can be estimated by using the revenue from Jersey for their use of the tax and the number of registered vehicles there. The latest of both of these figures is from 2014. This can then be applied to Guernsey using the Island's total vehicle numbers from 2015. This is a crude methodology but does have merits as Jersey is the closest comparable jurisdiction and is likely to have similar ratios of vehicle classes as Guernsey.

No of vehicles registered in Guernsey: 83,588 in 2015

Jersey income from VED in 2014: £760,000<sup>44</sup>

No. of vehicles registered in Jersey in 2014: 121,551<sup>45</sup>

Revenue from a possible Vehicle Emissions Tax is therefore £522,635.60

### Increase & Extend Motor Fuel Duty

In 2015 the revenue from all motor fuel duty was £17,082,000. Road fuel duty was 51.8p, marine petrol was 36.6p. In 2016 road fuel duty was increased to 58.5p, and marine petrol remained unchanged. Marine diesel is still exempt from taxation. The increase is predicted to raise £2.15 million per annum.

A number of scenarios could be used to increase or extend the motor fuel duty. Revenues generated are presented below. All of the figures presented are for **additional** revenue and therefore this would be on top of the £17 million already generated.

#### Scenario 1:

**5% increase in fuel duty, only on those fuels which are already levied.** This scenario is viable in terms of implementation as duty increases have occurred in previous years. However such an increase is likely to be socially unpopular and may be politically undesirable, as it would directly affect household expenditure.

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<sup>44</sup> States of Jersey (2015b)

<sup>45</sup> States of Jersey (2015c)

**Table 14: Increasing Motor Fuel Duty in Guernsey, Scenario 1**

Fuel Type	Total Quantity Consumed	Current Duty Rate (2016)	Increase of Duty by 5%	Additional Revenue
Road petrol	21,081,000 litres (2015)	58.5p	2.925p to 64.35p	£616,619.25
Road Diesel	10,359,000 litres (2015)	58.5p	2.925p to 64.35p	£303,000.75
Marine Petrol	360,000 litres (2012)	36.6p	1.83p to 40.26p	£6,588
<b>Total Additional Revenue</b>				<b>£926,208</b>

**Scenario 2:**

**Marine petrol duty is brought in line with other duties.** This scenario is again feasible however such a large increase in duty would be undesirable.

**Table 15: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 2**

Fuel Type	Quantity of Fuel Consumed	Current Duty Rate	New Duty Rate	Additional Revenue
Marine Petrol	360,000 litres (2012)	36.6p	58.5p	<b>£79,920</b>

**Scenario 3:**

**Marine diesel is no longer exempt and levied at same rate as marine petrol.** If all marine diesel use was levied at a rate equivalent to petrol, or even at a concessionary rate to this, the use of marine diesel would more fairly reflect environmental impact, and would introduce a significant revenue stream. An increase to 36.6p is the most viable option in this scenario, however as this would tax commercial use, there would likely be wider negative economic effects (i.e. increased transportation costs for imports) and therefore is not viable in this sense.

**Table 16: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 3**

Fuel Type	Quantity of Fuel Consumed	Revenue with Current Marine Rate of 36.6p	Revenue with Fuel Duty Rate of 58.5p
Marine Diesel	5,500,000 litres (2012)	£2,013,000	£3,217,500

## Scenario 4

**Marine duty is only levied on non-commercial vessels.** This is the most feasible of all of the fuel duty scenarios as it would introduce a marine diesel duty but would not carry the risks of resultant indirect impacts from commercial use (i.e. increased transport costs for imports).

**Table 17: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 4**

Fuel Type	Total Quantity of Fuel Consumed	Quantity Consumed by Non-Commercial Vessels	Additional Revenue with Fuel Duty Rate of 36.6p
Marine Petrol	360,000 litres (2012)	Not known. Calculated as if 100%	No additional revenue
Marine Diesel	5,500,000 litres (2012)	2,000,000 litres (2012)	£732,000
<b>Total Additional Revenue</b>			<b>£732,000</b>

## Scenario 5

**Aviation fuel duty is introduced.** The quantities of aviation fuel used for commercial and non-commercial use were not known. It is therefore not appropriate to use the estimates below as revenue totals for this scenario as a duty on commercial use would not be recommended. Indeed further to this, the application of an aviation fuel duty would **not be a viable tax** to introduce, as its indirect negative impacts would likely be extensive. Figures shown below are therefore purely for illustrative purposes.

**Table 18: Increasing/Extending Motor Fuel Duty in Guernsey, Scenario 5**

Fuel Type	Quantity of Fuel Consumed	Revenue with Tax Rate of 36.6p	Revenue with Tax Rate of 58.5p
Jet Fuel	4,076,000 litres	£1,491,816	£2,384,460
AVGAS	674,000 litres	£246,684	£394,290
<b>Total Additional Revenue</b>			<b>£2,778,750</b>

## Carbon/Energy Tax

The table below shows the current consumption and revenue from energy sources in Guernsey:

**Table 19: Guernsey Energy/Fuel Usage, Quantities & Current Duties Levied**

Fuel Type	2015 Average Retail Price	Total Quantities Used (in 2015, unless stated)	Current Duty	Current Revenue Raised	UK Duty (less rebates)
Road Diesel	£1.08/l	10,359,000 litres	0.585/l	£17,082,000 (2015 Actual)	£0.5795/l
Road Petrol	£1.06/l	21,081,000 litres	0.585/l		£0.5795/l
Marine petrol	Not known	360,000 litres (2012)	£0.366/l		Not known
Marine Diesel	Not known	5,500,000 litres (2012)	0		£0.1114/l
Jet Fuel	Not known	4,076,000 litres	0	0	£0.5795 (for private use)
AVGAS	Not known	674,000 litres			£0.3770/l
Kerosene	£0.46/l	23,868,000 litres	0	0	0 (for heating only)
Coal	£9.43 per bag	Not known	0	0	£0.01526 per kg
Butane gas	£38.46 (13kg bottle)	18,777 MWh	0	0	£0.01251 KWh
Natural gas	Domestic Rates: Standard tariff 0.1839, Economy tariff 0.1274	63,341 MWh	0	0	£0.00195 KWh
Gas oil	Not known	12,328,000 litres (this may include marine fuel)	0	0	£0.1114/l
Heavy fuel oil*	N/A	N/A	0	0	£0.1070/l
Electricity Generation	Domestic Rates: Normal rate £0.185, economy rate £0.077	Total Usage (domestic & non-domestic) 350,292,000 kWh	0	0	£18 per tonne of CO <sub>2</sub>
	N/A	Heavy Fuel Oil: 21,997,542 litres	0	0	£0.05711 per litre (based on £18 per tonne CO <sub>2</sub> )
	N/A	Gas Oil: 542,305 litres	0	0	£0.04916 per litre (based on £18 per tonne CO <sub>2</sub> )

\*Heavy fuel oil is used on Island for electricity generation and so is excluded from further workings.

Potential revenue is simulated by applying UK rates/levies on fuels that are not currently taxed in Guernsey. No changes are made to the revenue for motor fuel taxes, and so revenue from any increases or removal of exemptions would be in addition to the calculated revenue for other fuels. The scenarios from the previous motor fuels section could be added to revenue as appropriate.

## Electricity Generation Workings

Average carbon emissions for generation of electricity by Guernsey Electricity have been used to calculate the equivalent taxes that this would incur, aligned with the £18 per tonne of CO<sub>2</sub> used in the UK's Carbon Price Support mechanism. The average emissions also factor in carbon emissions from electricity generated by EDF in France and supplied to Guernsey.

Average for 2015 emissions (published by Guernsey Electricity): 179 gCO<sub>2</sub>/kWh

350,292,000 kWh generated or supplied by Guernsey Electricity.

179 gCO<sub>2</sub>/kWh x 350,292,000 kWh = 62,702,268,000 gCO<sub>2</sub> emitted.

This equates to 62,702.268 tCO<sub>2</sub>

CPS at rate of £18 tCO<sub>2</sub>: 62,702.268 x 18 = £1,128,640.82 potential tax to be levied.

## Gas Oil Workings

It is not clear whether the gas oil classification for 2015 includes marine fuel quantities (which were collected in 2012) and so it is likely that this revenue would be nearly half that stated. If this option were pursued, the quantities of gas oil consumed should be investigated and classed by use for more accurate revenue figures, therefore the figure stated below will be an over-estimate.

## Carbon Tax Revenue Summary Table

**Table 20: Carbon Tax Revenue Potential for Guernsey**

Fuel Type	Total Quantities Used (in 2015 unless stated)	Current Duty	UK Tax/Levy	Potential Additional Revenue
Road Diesel	10,359,000 litres	£0.585/l	0.5795/l	See Fuel Duty Workings
Road Petrol	21,081,000 litres	£0.585/l	0.5795/l	
Marine petrol	360,000 litres (2012)	£0.366/l	Not known	
Marine Diesel	5.5 million litres (2012)	0	0.1114/l	
Jet Fuel	4,076,000 litres	0	0.5795 (private use)	
AVGAS	674,000 litres	0	£0.3770/l	
Kerosene	23,868,000 litres	0	0 (heating use)	
Coal	Not known	0	£0.01526 per kg	Not known
Butane gas	18,777 MWh	0	£0.01251 KWh	£234,900.27
Natural gas	63,341 MWh	0	£0.00195 KWh	£123,514.95
Gas oil	12,328,000 litres (6,792,000 litres, removing marine use)	0	£0.1114/l	£1,373,339.20 (£756,629 removing marine use)
Electricity Generation	350,292,000 kWh	0	£18 per tonne CO <sub>2</sub>	£1,128,641
	Heavy Fuel Oil: 21,997,542 litres	0	£0.05711 per litre (based on £18 per tonne CO <sub>2</sub> )	£1,256,279 .62
	Gas Oil: 542,305 litres	0	£0.04916 per litre (based on £18 per tonne CO <sub>2</sub> )	£26,659.71
<b>Total Revenue</b>				<b>£2,243,685</b>



## Water Tax

Domestic usage: 2,508 megalitres in 2015 which is 2,508,000 cubic metres of water.

Water rates increased for metered supplies from 2015-16 by 2p, so a similar increase is simulated for a Water Tax.

An additional 2p per cubic metre = £1.96. It is simulated that all usage is from metered households, although the total for cubic metres for overall domestic use is a total of metered & unmetered supplies.

$0.02 \times 2,508,000 = \text{£}50,160$  in additional revenue.

This is extremely low. The actual total would be higher as 41% of supplies are unmetered and the unit charge for TRP is £0.52.

Domestic usage totals around 55% of total consumption and therefore it is unlikely that an increase in the cost per unit of water would result in a viable revenue source without significantly greater increase in unit price. Increasing unit prices for all non-domestic users is also unlikely to increase this revenue to a threshold where it becomes viable.

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