



COMMISSION ON TAXATION  
AN COIMISIÚN UM CHÁNACHAS

## PART 9

# TAX AND THE ENVIRONMENT



## Part 9:

### **Tax and the Environment** — *investigate fiscal measures to protect and enhance the environment including the introduction of a carbon tax*

**Section 1** is an introduction.

**Section 2** gives the context within which our deliberations were made. It also gives a broad outline of current environmental measures and issues.

**Section 3** looks in detail at the case for a carbon tax, a tax aimed at limiting emissions of carbon dioxide and other “greenhouse gases” which are capable of being converted to carbon dioxide equivalent measures.

**Section 4** examines other environmental taxes and fiscal measures that might be appropriate to support a sustainable environment.

**Section 5** considers revenue neutrality in the context of the carbon tax.

**Section 6** provides an overview of the ‘green economy’ and summarises our recommendations in this area.

**Our recommendations in this Part are as follows:****Taxing carbon dioxide emissions**

9.1	A carbon tax on fossil fuels should be introduced.
9.1.1	The carbon tax should be based on a standardised measure of CO <sub>2</sub> content of the energy product. Measurement factors used should accord with international norms.
9.1.2	The carbon tax should apply to energy products released for consumption in Ireland.
9.1.3	<ul style="list-style-type: none"> <li>• The tax rate should approximate the ETS price of carbon.</li> <li>• The price should be established annually, on a recognised market place for trading carbon credits.</li> <li>• A floor price for carbon should be set.</li> </ul>
9.1.4	Any phasing in of the tax rate should depend on the scale of the price.
9.1.5	<ul style="list-style-type: none"> <li>• The tax should be collected at the earliest practical point of supply and linked into the existing mineral oils tax system where appropriate.</li> <li>• The tax should be clearly visible at the point of final consumption to ensure it is not seen as 'just another tax'.</li> <li>• Working capital problems caused to small distributors/suppliers with slow stock turnover by the imposition of a tax at the earliest point of supply should be accommodated where practicable.</li> </ul>
9.1.6	<ul style="list-style-type: none"> <li>• In general, there should not be preferential rates of carbon tax.</li> <li>• Binding action-based and/or target-based monitored agreements to reduce emissions should be accommodated under the carbon tax design.</li> </ul>
9.1.7	<ul style="list-style-type: none"> <li>• Carbon tax should not apply to ETS participants.</li> <li>• Tax should not be imposed at this time on ETS participants in order to capture the gains they made from the free allocation of permits; the issue should be monitored and taxation may be appropriate in the future.</li> </ul>
9.1.8	Administrative rules for the carbon tax should fit in with existing tax provisions where practicable.

**Tax on other greenhouse gases**

9.2	Research into measures to reduce agricultural emissions – such as alternative technologies and feeding systems – should continue and be intensified.
9.3	If methane and nitrous oxide emissions from agriculture become capable of being monitored, reported and verified with sufficient accuracy, their exclusion from the carbon tax should be reconsidered.

## Other proposed fiscal measures to improve the environment

## Product taxes

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| 9.4 | <ul style="list-style-type: none"> <li>• Environmental product taxes should be considered where voluntary initiatives are unsuccessful.</li> <li>• If such taxes were to be considered, the criteria developed by us (see Box 9.8) should be met.</li> </ul> |
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## Energy efficiency

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| 9.5 | Continue the Accelerated Capital Allowance for energy-efficient equipment scheme for its current term; evaluate the potential for expanding the scheme to incentivise innovation (based, for example, on the Dutch model). |
| 9.6 | Ireland should support amendments to the EU VAT Directive that would allow the implementation of lower VAT rates for energy-efficient goods and services.  |
| 9.7 | Businesses that are not in the emissions trading scheme should be given a rebate on their carbon tax payments if they participate in an approved mandatory energy reduction programme.                                     |

## Transport

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| 9.8 | The VRT system should be replaced by a system based on car usage, in the longer term. Such a system should be introduced over a 10-year period in order to minimise adverse impacts (in relation, for example, to the existing fleet of tax-paid vehicles). |
| 9.9 | A focussed scrappage scheme, targeted at encouraging a switch to the purchase of electric and very low carbon emitting vehicles, should be considered.  |

## Section 1: Introduction

### 1.1 The environmental remit

We were invited, in the context of maintaining an equitable incidence of taxation and a strong economy, to consider the structure of the tax system and specifically to investigate “fiscal measures to protect and enhance the environment including the introduction of a carbon tax”. We were also asked to have regard to the commitment in the Programme for Government “to introduce measures to further lower carbon emissions and to phase in on a revenue neutral basis appropriate fiscal measures including a carbon levy over the lifetime of the Government”.

The Minister for Finance indicated in the October 2008 Budget that our Report would assist the Government in assessing how a carbon levy might best be structured and implemented fairly and consistently in Budget 2010.

Our environmental remit extends further than simply investigating the carbon tax proposal. We have also examined other fiscal measures aimed at protecting the environment.

The environmental agenda also presents opportunities for Ireland and we conclude this Part with an overview of the ‘Green Economy’.

## Section 2: Overview of environmental measures and issues

### 2.1 Environmental policy instruments

Markets are a means of reflecting scarcity; if demand for oil rises sharply and supply is constrained, prices rise and we are incentivised to cut back our consumption. However, the market fails to adequately protect environmental endowments – air, the capacity to absorb greenhouse gases, water, wildlife, landscapes – in part because there is no price signal telling us that they are getting scarce and should be used sparingly. Therefore, we have significantly depleted the capacity of the earth’s atmosphere to absorb greenhouse gases without serious risk of major climatic disturbance, with no feedback about pending scarcity, and little understanding of the volumes of greenhouse gases we emit, individually or collectively.

The solution proposed by economists is to repair the market failure by either imposing an environmental tax on emissions, or by capping emissions and allocating allowances to the emitters (such that the total allocation does not exceed the cap), and allowing them to trade on condition that the allowances they hold are sufficient to ‘cover’ their emissions. In either case, polluters are faced with a price per unit of pollution emitted that reflects the scarcity of the environment, and provides a continuing financial incentive to reduce emissions. This approach is favoured because:

- It is economically efficient – the response is left up to the polluters, and they will choose the least cost mix of responses
- It encourages innovation – there is a payoff to developing better and less expensive ways

to reduce emissions, and

- It is fair in the sense that those who choose to pollute most, pay most

In the case of environmental taxes, there may be a further benefit, in that the revenues can be used to achieve some combination of reduction in other taxes, improvement in the situation of the less well off, or more expenditure on environmentally beneficial activities.<sup>1</sup>

There is a range of other market interventions open to governments to help influence public behaviour where the environment is concerned - see Box 9.1.

#### Box 9.1: Other types of market-related instruments

- **Direct and indirect expenditures:** Subsidies, grants and loans for environmental improvements; also loans at low rates, tax breaks (such as capital allowances for eco-friendly investments) and tax credits
- **Enforcement incentives:** Fines for non-compliance with environmental regulations or performance bonds payable by polluters/users, which are refunded when an environmental standard is met
- **User charges:** Charges for water supply or for waste collection, or fees for dumping material at landfills. User charges may be aimed at financing the cost of treatment or disposal that is associated with the consumption of the product
- **Product taxes or levies:** These have the effect of reducing use of products which diminish environmental quality. Examples from Ireland include the plastic bags levy and the excise duty on petrol and diesel

## 2.2 Relevant principles in the application of environmental taxation

### Environmental taxes to take account of pollution costs

The rationale behind environmental taxes is that the additional economic cost they impose per additional unit emitted will act as an incentive to the emitters to reduce their emissions and associated environmental impacts.

Ideally, the additional economic cost will cover the external environmental costs associated with the activity, so that such costs are not fully carried over to third parties, but borne by the producers or consumers concerned. With a well-designed tax, the price reflects the costs the pollution in question imposes on society.

Environmental charges and taxes give effect to the polluter-pays principle. This was first recommended as a 'guiding principle' by the OECD in 1972, and then incorporated into the EU Treaty (Article 174). Its import is that the individuals and companies responsible for creating the pollution pay the relevant costs of their activities.

The United Nations glossary of environmental statistics (1997) describes it thus:

"The polluter-pays principle is the principle according to which the polluter should bear the cost of measures to reduce pollution according to the extent of either the damage done to society or the exceeding of an acceptable level (standard) of pollution."

<sup>1</sup> See: OECD Environment Directorate, 2006. The Political Economy of Environmentally Related Taxes, Paris, for a review of experience in the application of environmental taxes in OECD countries.

### Principles underpinning the environmental taxes agenda

We adopted a number of guiding principles to set the context of our work. These included our core principles of taxation – equity, simplicity, tax neutrality and flexibility – as well as operational principles that the approach adopted would be pragmatic and evidence-based. We agreed two additional principles in relation to the environmental agenda:

- Polluter pays
- Revenue neutrality

In practice, these principles ensure that any measures proposed by us on the environmental front will be well-targeted and proportionate. The need to take into account competitiveness issues and distributional effects - in other words, the impact on different sectors of the economy - is also noted.

**A targeted, proportionate measure** is one which addresses the problem that needs to be addressed. For example, if the demand for a product does not respond well to price changes (i.e. is 'inelastic' because, for example, consumers may not have alternative or substitute products), the imposition of an environmental tax is unlikely to have much effect on demand or production. Also, if the tax represents only a small proportion of the price, the effect may not alter behaviour. However, there is typically a distinction between the response in the short run (less than one year) and the impact on behaviour in the medium to long term – a negligible response in the short-term can often develop into a substantial one in the long-term. (See for example, Sterner (2007)<sup>2</sup>.)

International competitiveness issues arise where, for example, an environmental tax in Ireland would lead to companies moving production to countries with less stringent regimes. The result would be a fall in investment and employment opportunities in Ireland, because we adopted higher environmental standards. At the same time, there would be no reduction in global pollution because the environmentally-damaging activity is relocated to an area with more lenient regulatory or taxation regimes.

While targeted exemptions to address such problems reduce the effectiveness of the tax, they may be necessary to support economic activity and employment opportunities.

**Distributional effects** are also important. Certain environmental taxes – such as energy taxes – have a disproportionate impact on lower-income households who spend a relatively greater proportion of disposable income on fuel. If measures are not taken to compensate such households, there may be a widening of inequalities in the distribution of income.

## 2.3 How should environmental tax revenues be used?

### Rebalancing tax burdens

Environmental fiscal measures may be seen as serving a dual purpose. They provide economic incentives to protect the environment, and in addition a source of revenue to alleviate actual or future tax burdens in other parts of the tax system. The aim of an environmental tax measure may be to improve economic efficiency or contribute to economic growth – for example, by funding cuts in social insurance payments. Alternatively, they could be used to address social issues – funding tax cuts or social welfare increases for lower income households and/or to subsidise further action on emissions reduction. (We refer to the overall effects of carbon tax on vulnerable households in Section 5.)

2 Sterner, T. 'Fuel Taxes: An important instrument for climate policy', Energy Policy Volume 35, issue 6 June 2007 pp 3194-3202.

Tax-shifting policies, under which environmental tax revenues have been used to reduce other taxes, have been used in a number of countries.

A broad programme of environmental tax reform would shift the tax burden from 'goods' such as employment, to 'bads' such as pollution. A number of submissions to us suggested that support for environmental taxes increases if there is a clear idea of where the revenue is going. The argument here is that there is a tendency amongst industry and consumers to regard environmental taxes as a form of income generation for government, rather than an environmental tool. However, if the revenues are spent on, for example, environmental activities, it may negate this argument and increase public acceptability for the tax.

## 2.4 International context

### **Terminology: taxes, charges or levies?**

The OECD defines environmentally-related taxes as any payments to the general government budget, where the benefits provided by government to taxpayers are not normally in proportion to their payments. In other words, there is no specific return to the taxpayer.

It defines any compulsory payments to the government that are levied more or less in proportion to the environmentally-related service provided – such as the amount of waste collected – as fees or charges. In other words, payments are made for specific services.

In either case, the tax base is deemed to be of particular environmental relevance – for example, energy, transport, waste, measured or estimated emissions and natural resources. Frequently, the revenue generated by fees or charges is earmarked for environmental funds, while revenue from taxes tends to go to general budget. The term 'levy' is used by the OECD to cover both taxes and fees or charges. Actual use of the terms 'tax' and 'charge' in practice do not always reflect the OECD's analytical distinction.

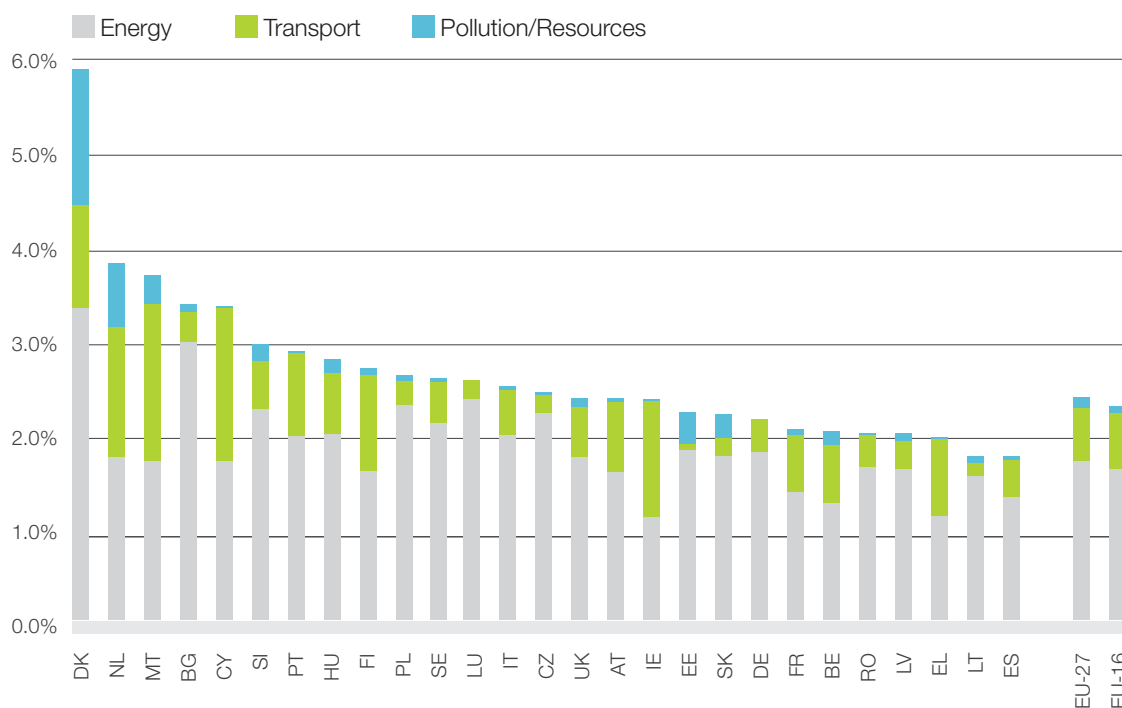
### **OECD environmental database**

The development of consistent definitions for environmental measures allows for comparisons between countries. In co-operation with the EU Commission, the OECD and the European Environment Agency have developed a database on environmental policy instruments. This covers both market-based instruments (environmental taxes, fees and charges, environmentally-related subsidies, tradable permit systems, deposit-refund systems) and voluntary approaches that are in operation in OECD countries (which includes EU Member States and non-EU members of the European Economic Area (EEA)).

The database for 2006 showed some 375 entries for environmentally-related taxes in OECD member countries. There were a further 250 environmentally-related fees and charges. Energy products (150), motor vehicles (125) and various forms of waste (50) accounted for most of the taxes, with the balance in numbers made up by a huge range of product and other taxes, including batteries tax, beverage containers tax, tax on aircraft noise, tax on groundwater extraction, pesticides tax and tyres tax. In revenue terms, taxes on auto-fuels and vehicles account for some 90% of environmentally-related revenues across all OECD countries.

The environmental tax-to-GDP ratio for EU Member States for 2007, broken down by type of tax (energy, transport, pollution/resources), is shown in Figure 9.1. It can be seen that most countries (including Ireland) fall in the band from 2% to 3%. Environmental tax revenues exceed 3.5% of GDP in Denmark, the Netherlands and Malta. While energy taxes are predominant in most Member States, transport taxes account for about half of environmental taxes in Ireland, Cyprus and Malta.

Fig. 9.1: Environmental tax revenues as % GDP 2007, EU-27



Source: Taxation Trends in the European Union – EU Commission (2009) available from: [http://ec.europa.eu/taxation\\_customs/resources/documents/taxation/gen\\_info/economic\\_analysis/tax\\_structures/2009/2009\\_full\\_text\\_en.pdf](http://ec.europa.eu/taxation_customs/resources/documents/taxation/gen_info/economic_analysis/tax_structures/2009/2009_full_text_en.pdf)

## 2.5 Environmental tax revenues

The relative success of environmental policy cannot be measured in terms of tax yield, as a measure that is comparatively minor in revenue terms may be very important in environmental terms.

More generally, interpreting revenues from environmentally-related taxes can be difficult.

For example:

- The proportionate breakdown between environmental and other taxes depends on the level of the traditional taxes in a country
- High environmental tax revenues may be transitory, if the new taxes trigger large changes in behaviour and result in the erosion of the tax base (as producers or consumers adapt in the longer run). Revenue sustainability depends on the availability of substitutes, or the ability of consumers and businesses to change their behaviour
- Low environmental tax revenues may be attributed to the tax being set at too low a level. On the other hand, they may be attributed to high taxes and a low base of pollution
- The issue may be complicated by consumers travelling to low tax jurisdictions to buy products. Thus, a country with low fuel rates may have high fuel revenues because of the numbers of foreigners going there to fill their tanks

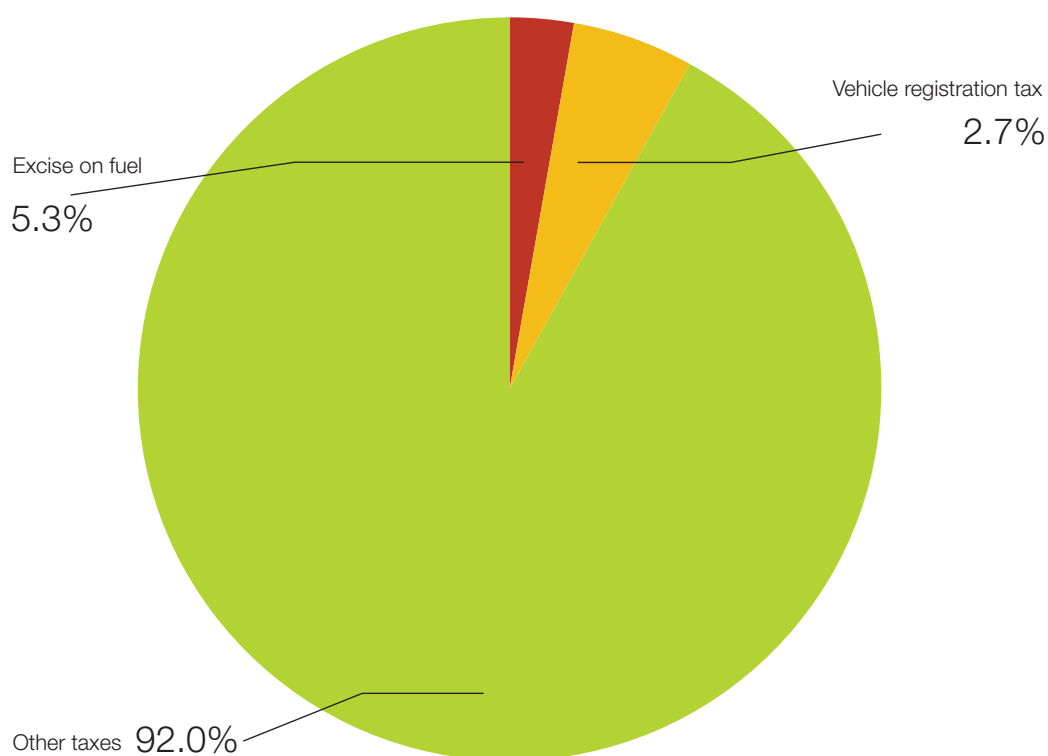
## 2.6 Environmental fiscal measures in Ireland

### Fuel and motor taxes

In common with most countries, Ireland has had taxes that have had an environmental impact long before we ever had taxes established as an instrument in environmental policy. Also in common with most countries, VAT and excise duties on motor fuels and on vehicles are the primary 'environmentally-related' taxes in use<sup>3</sup>.

In 2008, total excise receipts were €5.6 billion (14% of total tax revenue). Excise from fuel products alone accounted for approximately €2.17 billion, and vehicle registration tax (VRT) came to €1.1 billion. Excise duties on fuel and vehicle registration tax comprised some 8% of total receipts in 2008.

Fig 9.2: Excise on fuel, VRT as % total revenue, Ireland 2008



Source: *The Revenue Commissioners - Annual Report 2008*

The "rebalancing" of vehicle registration tax (VRT) began in Finance Act 2008, when a tax based on emissions rather than engine size was introduced. Motor tax was also rebalanced. In addition, changes were made to the capital allowances and leasing regime for business cars, to link the availability of relief to CO<sub>2</sub> emission levels. The rebalancing process was extended in the Finance (No. 2) Act 2008 to provide for a new CO<sub>2</sub> emissions-based system for calculating benefit-in-kind (BIK) in respect of company cars provided for employees<sup>4</sup>.

3 Using the OECD definition of the term, that the tax base is of particular environmental relevance – see section 2.4 in the text.

4 The provision is subject to Commencement Order; this has not been signed at time of writing.

## Plastic bags

Tax measures with specific environmental objectives have come to feature more strongly in Ireland in recent years. The environmental levy – or so called ‘plastic bag tax’ – is a good example of this.

### Box 9.2: The plastic bag levy

- Introduced in March 2002 at 15 cent per bag
- Charge applies at the point of sale: customers pay the full amount, which is itemised on the receipt
- Retailers make quarterly returns and payments to the Revenue Commissioners by direct debit. Administration costs are low because the system is integrated with VAT returns
- Plastic bag levy revenues (approximately €120 million up to end-2008) are earmarked for the ‘environmental fund’ and support waste management, litter and other environmental initiatives
- Aim was to encourage the use of reusable bags. The levy had an immediate effect on consumer behaviour, with an estimated overnight fall in consumption of bags, from 328 per head to 21 per head
- Income from the levy increased during the course of 2006, suggesting that plastic bag usage rose to 31 bags per capita. Accordingly, the price was also increased
- The levy was raised to 22 cent per bag from July 2007

## Tax reliefs and incentives

Some environmentally-related reliefs and incentives have already been introduced to the Irish tax system.

For example, policy support mechanisms for renewable energy in Ireland include the following measures:

- The biofuels excise relief scheme, introduced in November 2006 (see Box 9.3)
- Tax commitments in the Department of the Environment, Heritage and Local Government’s National Climate Change Strategy (2007 - 2012) include:
  - Extending the qualifying period for corporate tax relief for corporate equity investments in certain renewable energy generation projects, and
  - Extending the Business Expansion Scheme and the Seed Capital Scheme, both of which can be used for investment in companies carrying on renewable energy generation and recycling

### Other measures include:

- A scheme of accelerated capital allowances for energy-saving plant and machinery (see section 4.3 of this Part)
- Allowances and credits issued under emissions trading schemes can now be treated in a tax neutral manner for securitisation purposes

*Box 9.3: The biofuels excise relief scheme*

- A €200 million excise relief scheme for biofuels was introduced in Budget 2006
- The aim is to reach a 2% target for biofuels penetration of the transport fuels market and CO<sub>2</sub> savings of over 250,000 tonnes per annum
- Four types of biofuels are supported under the scheme:
  - Bio diesel made from pure plant oil, used cooking oil and tallow, blended with fossil diesel and sold at regular diesel pumps
  - Bio diesel in higher blends of up to 100% in specific fleets of vehicles whose engine warranties cover these blends
  - Bio ethanol made from wheat, barley, whey and other feedstock, blended with petrol and sold at regular petrol pumps
  - Pure plant oil made from the oilseed rape crop and used in modified diesel engines
- Sixteen projects have been selected through the application process for excise relief; reliefs are awarded by the Minister for Finance in consultation with the Minister for Communications, Energy and Natural Resources
- The successful projects cover a broad range of business sectors including renewable energy companies, oil companies, recycling companies and food and farming sector businesses

## Section 3:

### Carbon tax

#### 3.1 Context – the climate change challenge

The introduction of a carbon tax requires a completely new tax charge and structure. While the primary focus was on the form the tax should take (in accordance with our terms of reference), we were also cognisant of the fact that the scale of the tax would have policy implications for other aspects of our terms of reference – such as supporting economic activity and competitiveness.

The importance of reducing greenhouse gases<sup>5</sup> to curb climate change is now well documented. Six groups of greenhouse gases have been identified as contributing most to global warming:

- Carbon dioxide (CO<sub>2</sub>),
- Methane (CH<sub>4</sub>),
- Nitrous oxide (N<sub>2</sub>O),
- Hydrofluorocarbons (HFCs),
- Perfluorocarbons (PFCs), and
- Sulphur hexafluoride (SF<sub>6</sub>).

As emissions from all six sources may be converted to carbon equivalent measures, a carbon tax may apply to emissions from any of the greenhouse gases.

<sup>5</sup> Greenhouse gases are gases in the atmosphere contributing to the greenhouse effect (i.e. the process by which the atmosphere captures and recycles energy emitted by the earth's surface).

## Carbon tax in the EU

There is wide agreement that tackling climate change requires that there be a credible long-term stable price on emitting carbon. For some time, the EU has been in favour of a co-ordinated carbon energy tax to reduce emissions in an effort to combat global warming. It put forward a proposal in 1991 for a tax that was based both on carbon emissions and on the energy content of fuels<sup>6</sup>. The proposal contained certain exemptions for energy intensive industries, and other measures to even out the disparities between Member States in terms of their dependence on different energy sources.

While there is still no European-wide carbon tax, several EU Member States introduced carbon/energy type taxes in the 1990s, including Sweden (1990), Denmark (1992), the Netherlands (1996), Finland (1997), Germany (1998) and the UK (1999).

There is now an EU-wide Energy Tax Directive (ETD), which sets out the current framework for taxing energy products across the Community. We also took account of this in our deliberations. The Directive, which came into force in 2004, widened the scope of the EU's minimum rate system for energy products, previously limited to mineral oils<sup>7</sup>, to all energy products including coal, natural gas and electricity. Peat is exempt. The current position in Ireland is:

- Oil, auto fuel and LPG are taxed at various rates per 1,000 litres
- An exemption (derogation) applies for natural gas; broadly speaking, this expires in 2013, or when natural gas reaches 25% of energy consumption in Ireland, if that comes sooner
- In accordance with the ETD, coal has been taxed since 2005, but Ireland availed of several exemptions from this tax. (The exemptions include coal for domestic use, for electricity generation, and for use in agriculture/forestry; also coal used by charities)
- An excise duty on electricity – 'electricity tax' – was introduced from October 2008. (There are a number of exemptions, including supplies to domestic households, electricity generated from renewable sources, and electricity produced from eco-friendly combined heat and power generation)

A proposal to amend the ETD was due to be published by the EU Commission before the end of 2008; its timescale is now uncertain. This may include the proposal that each tax rate would have separate energy and carbon elements.

## Kyoto Protocol and emissions trading

The Kyoto Protocol is a protocol to the UN Framework Convention on Climate Change (1992), which was signed by participating countries in December 1997, and committed them to agree to specific reductions in greenhouse gas emissions in the period 2008-2012. The Protocol was ratified in February 2005 and approximately 175 countries are signatories. The EU signed up to the Kyoto protocol in addition to the individual Member States. The 15 countries that were Member States of the EU in 1990 were given a collective target for 2008-2012 of minus 8% over 1990 emission levels. Under the EU burden-sharing agreement, Ireland's allocation within this amounts to plus 13% over our 1990 emissions levels.

6 A broad-based tax on all energy sources (and not just the CO<sub>2</sub> content in fossil fuels) does not lead to maximum reductions in CO<sub>2</sub> emissions (maximum abatement), because it ignores the relationship between the demands for fossil and non-fossil fuels (i.e. cross-price elasticities). A pure carbon tax would, on the other hand, increase the price of certain fuels only, leading (in theory at least) to an increase in demand for non-carbon fuel substitutes.

7 Petrol, diesel, kerosene, LPG, heavy fuel oil.

Emissions trading – sometimes called ‘cap and trade’ – was one of a number of market mechanisms agreed to help countries achieve their Kyoto targets. The EU has channelled its efforts into creating a trading system since Kyoto. The EU Emissions Trading Scheme (EU ETS) came into operation on 1 January 2005 and key elements are set out in Box 9.4.

**Box 9.4: EU emissions trading scheme (EU ETS)**

- The EU ETS came into operation on 1 January 2005 and operated on a pilot basis across the EU (with no binding targets) until 31 December 2007 (phase 1)
- Phase 2 runs from 2008 to 2012, which coincides with the first Kyoto commitment period, and has binding targets for each Member State. Some of the target – in Ireland’s case, about 30% of emissions – is met under the trading scheme. (Typically, approx. 50% of emissions in other Member States are covered under the ETS; Ireland’s figure is lower because of our high proportion of emissions from agriculture, which falls outside the remit of the ETS)
- Under the EU ETS, each Member State has a cap on CO<sub>2</sub> emissions for all installations covered by the scheme; each installation gets an allowance (from its national regulatory authority) for a given period
- Four categories of activity are covered – energy activities; iron, steel and metal ore production/processing (ferrous metals) activities; cement, glass and ceramics production (mineral industry) activities; and timber, paper, board production activities. In each case, the ETS covers installations where the level of activity is above certain specified thresholds
- About 70 companies in Ireland are in the ETS, operating in sectors covering power generation, large boilers, cement, lime, glass, ceramics, oil refining and paper mills
- The principle behind the trading scheme is as follows:
  - The polluters must hold sufficient allowances at the end of the period to ‘cover’ their emissions for the period
  - If they emit more than their allowances, they must buy allowances from those who haven’t reached their threshold
  - These transactions produce a price per unit of pollution. It provides an incentive to polluters to reduce emissions (and sell their surplus allowances)
- Emissions must be monitored and reported in accordance with agreed guidelines that apply

**EU energy and climate change package of December 2008<sup>8</sup>**

In December 2008, the European Union agreed a set of legally binding obligations for the Member States. In regard to the EU ETS, the trading period has been extended to 2020, and the overall EU cap on emissions has been reduced by 21% from the 2005 base. For the non-trading sectors (agriculture, transport, residential and commercial, light industry, waste) each Member State has been given a legally binding cap. Ireland’s legally binding cap is a 20% reduction from a 2005 base.

## 3.2 Current state of play in Ireland

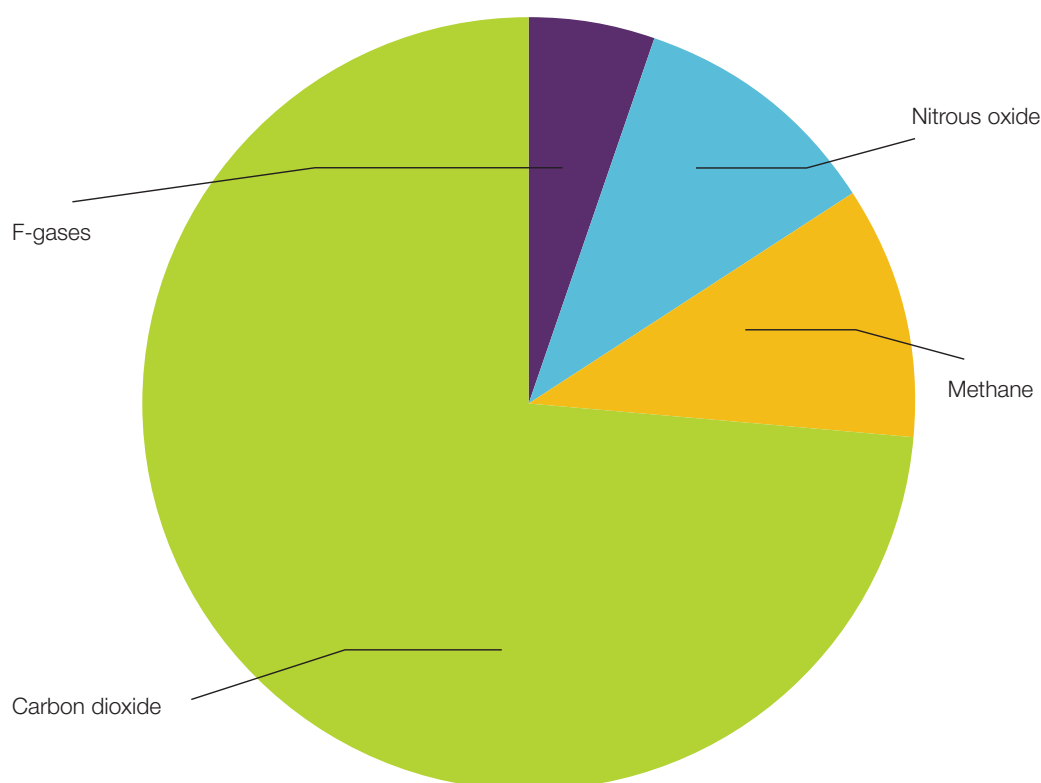
The following Table and Chart show a breakdown of total greenhouse gas emissions for Ireland for 2007.

Table 9.1: Emissions in 2007, Ireland

Gas	Emissions Gg CO <sub>2</sub> equivalent	
Carbon dioxide	46,480	68.13%
Methane	12,963	19.00%
Nitrous oxide	8,076	11.84%
F-gases (HFCs, PFCs, SF <sub>6</sub> )	701	1.03%
Total	68,220	100%

Source: Environmental Protection Agency (EPA), National Inventory Report 2009. "Table 2.1- Greenhouse Gas Emissions 1990 – 2007", Page 26 (figures include net CO<sub>2</sub> from activities related to land-use, land-change and forestry (LULUCF)). Note: Gg = 1,000 tonnes.

Fig 9.3: % Breakdown of emissions 2007, Ireland



Source: Derived from the figures in Table 9.1

### Targets up to 2012

Ireland's greenhouse gas emissions were 55.6 million tonnes in 1990<sup>9</sup>. Our EU commitments allow for an annual average emissions level of 62.8 million tonnes for 2008–2012 (i.e. not more than a 13% increase on our 1990 total). Our annual average actual emissions were about 7 million tonnes over the baseline in 2005 and in 2006 – or 25% over the 1990 total for each of these years.

9

This is an agreed figure which was calculated using CO<sub>2</sub>, N<sub>2</sub>O and CH<sub>4</sub> emissions for 1990 and Fgas emissions for 1995.

The deterioration in the economic outlook since 2008 has meant that projected outturns for future emissions are less pessimistic than previous estimates. In fact, emissions from sectors covered by the emissions trading scheme are now projected to be less than the amount allocated in the National Allocation Plan 2008-2012 (see below). As Table 9.2 shows, the latest projections suggest that Ireland will come in below target in 2012.

*Table 9.2: Projected annual emissions to 2012 and distance to Kyoto target (62.8 MtCO<sub>2</sub> equivalent)*

MtCO <sub>2</sub> equivalent	With measures (WM)		With additional measures (WAM)		Economic shock plus WAM	
	Projected emissions	Distance to limit	Projected emissions	Distance to limit	Projected emissions	Distance to limit
2008 - 2012	65.4	2.5	61.8	-1.0	58.4	-4.5
of which:						
ETS	19.6		17.7		16.6	
Non-ETS	45.8		44.2		41.8 to 42.3	

Source: Environmental Protection Agency – Ireland's Greenhouse Gas Emissions Projections 2008 - 2020 (March 2009) – Table 3 on page 15

- Numbers do not sum due to rounding
- With measures means emissions forecasts are based on policies in place at end 2007. With additional measures means forecasts incorporate planned energy saving policies. Economic shock means forecasts incorporate up to date recession data. See text below for more detail on the three scenarios

Summary details on our carbon commitments to 2012 are provided in Box 9.5.

**Box 9.5: Ireland's carbon commitments to 2012**

- 1990 greenhouse gas emissions level = 55.6 million tonnes
- 2008-2012 targets agreed under EU/Kyoto = 62.8 million tonnes (annual average) or 13% over 1990 level
- 2006 emissions = 69.76 million tonnes, or 25.5% above the 1990 level
- Average annual emissions = 25% above the baseline level
- Exceeding the target comes at a cost to the Exchequer. The excess requires extra permits to be purchased from other countries, the cost depending on price per tonne. The National Treasury Management Agency (NTMA) was established as the purchasing authority for the State under the Carbon Fund Act 2007
- Ireland's National Allocation Plan 2008 - 2012 (drawn up by the EPA and approved by the EU in February 2008) allocates about 30% of Ireland's projected emissions for the period to installations covered under the EU emissions trading scheme. Under the National Allocation Plan, emissions amounting to 22.3 million tonnes of CO<sub>2</sub> per annum are assigned to the ETS sector
- The remaining 70% of Ireland's greenhouse gas emissions are accounted for by the non-trading sectors – principally agriculture, transport and residential

All sectors have a role to play in reducing emissions. The most extreme difficulties arise if the focus is on one sector. The most appropriate course is for emissions reductions to occur up to the point where the cost per 'tonne of carbon dioxide reduced' costs the same everywhere. In this way the nation does not end up paying for expensive reductions while cheaper reductions in other areas are left unexploited.

### **Obligations after 2012**

Our terms of reference require us to take a medium to long-term strategic perspective. As noted above, the EU energy and climate change package of December 2008 requires demanding emissions-reduction targets for sectors outside the emissions trading scheme (the non-trading sectors). Ireland's target requires us to reduce emissions by some 20% over baseline 2005 levels. (Under the climate change package, a single EU-wide cap has been agreed for sectors covered by the EU Emissions Trading Scheme. This means that Ireland does not have any specific national emissions target for emissions from our ETS installations by 2020. Our 20% target is for the non-ETS sectors.)

### **Projections for Ireland**

The Environmental Protection Agency (EPA) has produced greenhouse gas emission projections under two scenarios for each key emission sector up to 2020. The scenarios, which depend on policy developments, are:

- With measures (this is a baseline energy forecast, which incorporates the estimated impact of policies in place by end-2007), and
- With additional measures (this is a more optimistic scenario, which incorporates planned measures in the Energy White Paper and National Energy Efficiency Action Plan)

The EPA projections are underpinned by energy forecasts produced by Sustainable Energy Ireland (SEI), which are based on the Credit Crunch scenario from the ESRI's Medium-Term Review 2008-2015, updated to take account of the Autumn 2008 Quarterly Economic Commentary. An *economic shock* analysis was carried out to take account of more recent information on the depth of the recession.

Table 9.3 following shows projected emissions for 2020 for the non-ETS sector, using the additional measures plus *economic shock* scenarios. Emissions in the base year of 2005 from the non-trading sectors were 48.3 million tonnes of CO<sub>2</sub> equivalent. The obligation to reduce these emissions by 20% amounts to 37.9 million tonnes of CO<sub>2</sub>e by 2020<sup>10</sup>.

<sup>10</sup> In the event that a global agreement is reached at the UN Framework Convention on Climate Change (UNFCCC) in Copenhagen in December 2009, the reduction obligation may be increased from 20% to 30%.

Table 9.3: Ireland's emissions projections for the non-ETS sectors to 2020

Non-trading Sectors	2005	2020 (With Additional Measures) and Economic Shock
	MtCO <sub>2</sub> equivalent	MtCO <sub>2</sub> equivalent
Agriculture (A)	19.6	17.8
Residential (R)	7.4	6.6
Transport (T)	13.0	16.0
Waste (W)	1.8	1.4
Total	41.8	41.8
Other (commercial and light industry)	6.5	3.1
<b>Grand total</b>	<b>48.3</b>	<b>44.9</b>

Source: Ireland's Greenhouse Gas Emission Projections 2008-2020, EPA, March 2009, p. 17 and 19.

We note that, even incorporating the impacts of the economic shock, emissions are projected to exceed the obligation by 7 million tonnes of CO<sub>2</sub> equivalent by 2020 (i.e. 44.9 MtCO<sub>2</sub>e minus 37.9 MtCO<sub>2</sub>e). However, Ireland is allowed to net out carbon sequestered by afforestation, and this is expected to fall in the range of 2.2 to 4.4 million tonnes, so the net overshoot will be in the range of 4.8 to 2.6 million tonnes.

In terms of impact on emissions, it will be the effectiveness of a carbon tax, in combination with other policies in reducing emissions from the residential, transport, and commercial and light industry sectors, that will be of most policy relevance as regards climate change. We now consider these issues. The following two sections examine the imposition of a carbon tax to limit carbon dioxide emissions (section 3.3) and the other greenhouse gas emissions (section 3.4). Section 4 examines other fiscal measures.

### 3.3 Taxing carbon dioxide emissions

The combustion of fossil fuels<sup>11</sup> is the largest source of carbon dioxide (CO<sub>2</sub>) emissions globally. CO<sub>2</sub> emissions also arise from certain industrial processes and product uses, such as cement production, mineral production and the use of petroleum-based products for purposes other than energy production (such as in plastics and solvents).

Table 9.1 indicates that Ireland's carbon dioxide emissions in 2007 amounted to over 68% of total greenhouse gas emissions. These came mainly from energy, manufacturing and transport.

The rationale behind a carbon tax on fuel is to change the relative price of fuels based on CO<sub>2</sub> emissions, in order to change consumption patterns, encourage fuel efficiency and lead to an improvement in environmental quality. A carbon tax is based on the carbon content of the fuel being consumed. If the tax works as intended, consumers make the switch to alternative energy products, and there is a permanent incentive to reduce emissions at the place of consumption.

<sup>11</sup> Fossil fuels are hydrocarbon deposits derived from living matter that build up underground over geological periods. They can be liquid (oil), solid (coal, peat) or gaseous (natural gas).

Our terms of reference in relation to carbon tax were quite specific. We were asked to have regard to the commitment in the Programme for Government to phase in, on a revenue neutral basis, a carbon levy over the lifetime of the Government. We were asked to commence work immediately in the area of the carbon tax, because it required a new tax charge and structure. We were reminded, in the 2008 October Budget, that our Report would assist the Government in assessing the structure and implementation of a carbon levy in Budget 2010.

We present our recommendation on carbon tax in the context of the above.

#### **Recommendation 9.1**

A carbon tax on fossil fuels should be introduced.

#### **Costings**

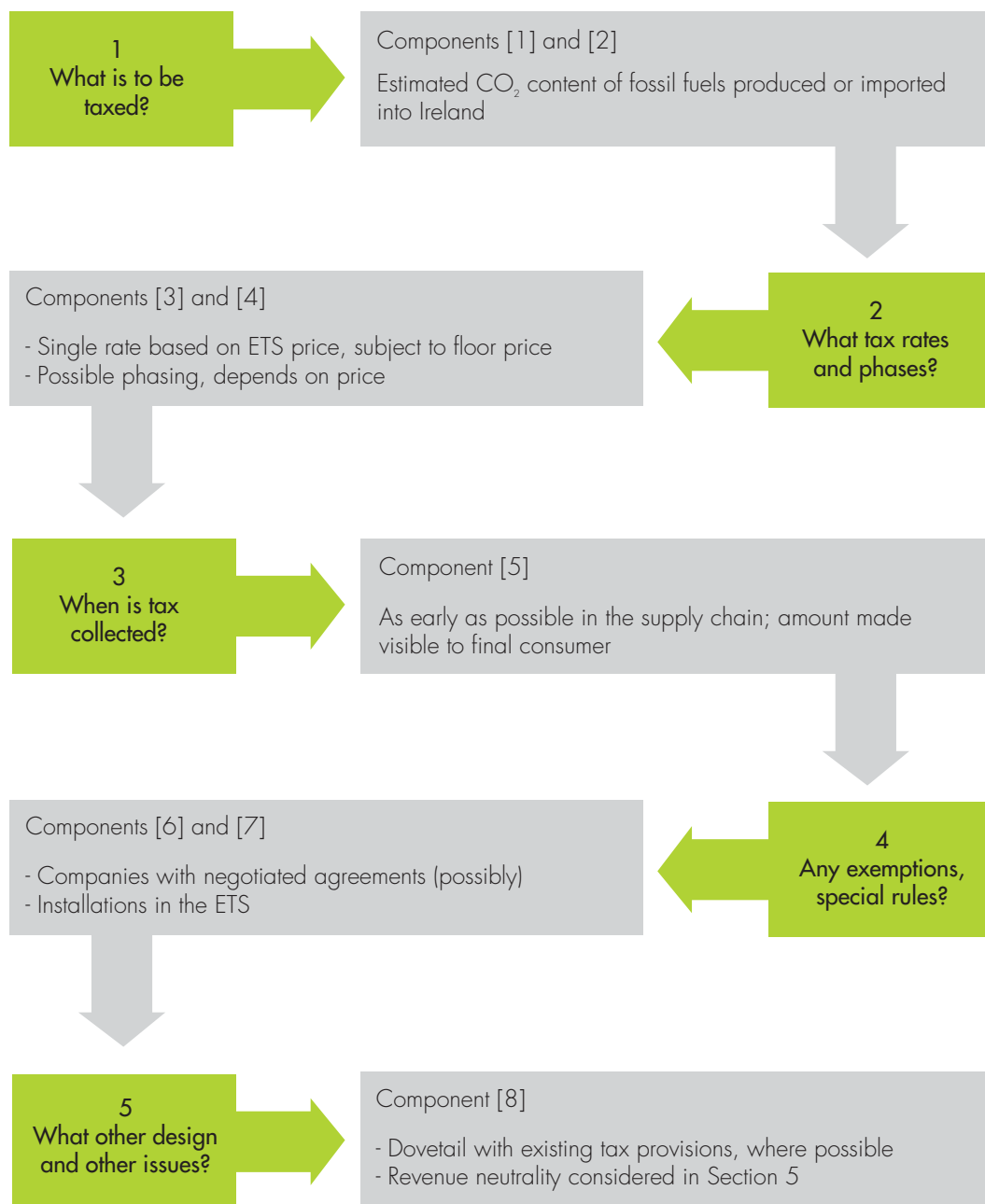
Estimates from the ESRI suggest that a carbon tax on the lines we propose of €20 per tonne could raise revenue of some €480 million in 2010 rising to €500 million in 2012<sup>12</sup>. Obviously the revenue raised would depend on the level of the tax (which in turn is largely dependent on the ETS price for carbon permits and the floor price that is set). We also note that the ESRI estimate does not take account of exemptions or special rules that may apply – for example, our detailed proposal recommends that businesses with approved, negotiated energy agreements should be accommodated under the carbon tax design.

12 See Table B1 and Appendix 2 of "Recovery scenarios for Ireland" Bergin, A., Conefrey, T., Fitz Gerald, J. and Kearney, I. ESRI Research Series No. 7 May 2009.

## The carbon tax proposal in detail

The diagram at Figure 9.4 gives an overall picture of the carbon tax scheme we developed for fossil fuels.

Fig 9.4: Main elements of the carbon tax on energy proposal



Our recommendations in relation to each of the carbon tax components are summarised below in Box 9.6. The rationale behind each component of the tax – including options that were considered – is outlined in the following paragraphs.

*Box 9.6: Components of the carbon tax*

- [1] Carbon tax should be charged on a standardised measure of the carbon dioxide content of the energy product; the measurement factors that are used should accord with international norms.
- [2] The tax should apply to energy products released for consumption in Ireland.
- [3] The tax rate should approximate the permit price under the EU ETS. This should be established annually on a recognised market place for trading carbon credits. A floor price, below which the tax should not fall, is also appropriate.
- [4] Any phasing in of the tax rate should depend on the scale of the price.
- [5] The tax should be collected at the earliest practical point of supply. It should be clearly visible at the point of final consumption.
- [6] In general, there should be no preferential rates of carbon tax, although certain exceptions may apply in relation to businesses with legally binding negotiated agreements to reduce emissions.
- [7] Carbon tax should not apply to EU ETS participants, nor should tax be imposed at this time on such participants in respect of the gains they made from the free allocation of permits.
- [8] Administration rules for the new carbon tax should fit in with existing tax provisions wherever practicable.

**Component [1]: The tax charge**

Carbon dioxide emissions from peat, coal, oil, auto fuel, LPG and natural gas will be covered by the tax. Different fossil fuels produce different amounts of CO<sub>2</sub>. The internationally agreed standard for comparing the amounts of CO<sub>2</sub> emitted by the different fuels is called the 'tonne of oil equivalent' (TOE)<sup>13</sup>, which indicates the amount of emissions that are expected to be produced when the fuel is used. It is generally accepted that CO<sub>2</sub> content is a very good proxy for emissions.

Emissions on the basis of this standardised measure for selected fuels are as follows:

*Table 9.4: Emissions factors for fossil fuels*

Fossil Fuel	Tonnes of CO <sub>2</sub> emitted (per TOE)
Peat - briquettes	4.14
Coal	3.961
Fuel oil	3.182
Diesel	3.069
Petrol	2.927
LPG	2.667
Natural gas	2.3

Source: [http://www.sei.ie/Publications/Statistics\\_Publications/Emission\\_Factors/](http://www.sei.ie/Publications/Statistics_Publications/Emission_Factors/)

13 This is the amount of energy produced by burning one tonne of crude oil. It is defined by the International Energy Agency (IEA)/OECD as being equal to 41.868GJ.

The tax is applied per tonne of CO<sub>2</sub> emitted, which means that fuels generating the greatest amount of carbon are taxed proportionately more than cleaner fuels. For example, a rate of €20 would mean tax per TOE (excluding VAT) of €82.80 (€20 × 4.14) for peat and €46 (€20 × 2.3) for natural gas.

The figures in Table 9.4 are indicative only; there are small variations in values quoted by different sources. It is not our function to set exact emissions factors for the purposes of the carbon tax. We recommend that, as a general principle, agreed EU measures – such as the framework used under the EU ETS – should be adopted.<sup>14</sup> We are aware that the proposed amendments to the Energy Tax Directive may also clarify emissions factors in relation to the different energy products.

We considered three alternative approaches to using a standardised measure of CO<sub>2</sub> content:

- The first of these was to have an *ad valorem* tax, based on the value of product sold. This was rejected, because such a measure is not linked to carbon content. We agreed that defining a tax base in specific terms is the appropriate way to capture the negative externalities, because it is the physical quantity of fuel used to produce the energy that is linked to the emissions, not the pre-tax price of the fuel. Submissions also suggested that the tax should be a monetary amount (rather than a percentage) in order to provide a stable price signal to industry. A tax based on the value of the product sold would also not be in accordance with the Energy Tax Directive
- The second alternative was to tax directly measured actual emissions. While this would give better linkage to the pollution source, we did not regard it as practical, especially when there are a huge number of separate emissions sources
- The third option involved taxing the excess CO<sub>2</sub> produced relative to natural gas or some other standard, in order to encourage fuel switching. While this had merit from an environmental point of view, we rejected it on the grounds that it was overly complex, favoured certain sectors over others and was not in line with the system used in the EU Emissions Trading Scheme

#### Recommendation 9.1.1

The carbon tax should be based on a standardised measure of CO<sub>2</sub> content of the energy product. Measurement factors used should accord with international norms.

### Component [2]: The products covered

We propose that the tax would be levied on domestic and imported processed fuels. It seems logical that exporters of emitting products would be exempt, if the emissions occur outside Ireland; and importers of emitting products would be taxable, if the emissions occur in Ireland.

The Revenue Commissioners have indicated that, as an excise duty, carbon tax would be charged when products are released for consumption in Ireland and would not, therefore, apply to exports.

#### Recommendation 9.1.2

The carbon tax should apply to energy products released for consumption in Ireland.

<sup>14</sup> This suggests that more detailed emissions factors may be used in practice. For example, separate emissions factors are used for kerosene and gas oil under the EU ETS, while emissions factors for certain fuels (such as peat) depend on the product's physical source and are site specific.

### **Component [3]: The carbon price**

The tax should, subject to a minimum level, be set at the level equal to the carbon price for emissions trading under the EU ETS – that is, the international price of emissions. In broad terms, a uniform carbon price is both logical and equitable – trading and non-trading sectors are treated the same, and the abatement costs (per tonne of CO<sub>2</sub> reduced) are the same for persons paying carbon tax or buying carbon credits. A floor price is also appropriate, as indicated below.

Under emissions trading, EU ETS permit prices adjust in line with demand and supply. Because the actual permit price changes daily and may fluctuate significantly (unlike tax rates, which are generally changed as part of the annual budget cycle), we propose that the tax rate would be linked to the carbon price in the futures market for the next calendar year. A frequently changing rate would cause uncertainty for business, would be less efficient and would create compliance and administration costs.

A number of submissions to us agreed with this broad approach. In addition, the National Competitiveness Council suggested that the tax should be introduced at a low rate and ramped up to match the ETS carbon price. The Environmental Protection Agency made the point that distortions would be created if the carbon tax and ETS allowance price differed substantially in the long term, as businesses would focus on reducing tax rather than emissions.

We considered two alternative approaches to the tax level. One was that a punitive rate to meet emissions reduction targets should be set. The other was that the rate should reflect all the costs that were involved. We rejected these options. The carbon tax is a visible, concrete move in the right direction towards implementing Ireland's climate change obligations. Its purpose is not to achieve a given level of emissions reductions. Some estimates suggest that a carbon tax of over €180 per tonne would be needed to achieve a reduction of 20% in energy-related CO<sub>2</sub> emissions from non-ETS sectors (by 2020, over 2005 levels).

### **The need for a floor price**

ETS permit prices have been quite volatile. As an illustration, the futures price for December 2009 was close to €20 in November 2008. It had fallen to around €12 by January 2009, and was as low as €8 in February 2009. It had risen close to €15 by June 2009.

A floor price for carbon would be appropriate. We suggest that a rate of €20 might be reasonable in meeting the objectives of a carbon tax as outlined above; in any event the floor price should be monitored to ensure it remains effective. The advantages of a floor price include certainty and revenue yield. Our general philosophy - that taxes should not be too cyclical - is dealt with in some detail in Part 4 of our Report. In addition, it may be noted that if the carbon price was really low, then not only would transaction and collection costs be disproportionately high, but also the effect on behaviour could be negligible. This is not in keeping with the purpose of the carbon tax.

For illustrative purposes, domestic fuel price increases resulting from a carbon tax of €20 per tonne of CO<sub>2</sub> in the first quarter of 2009 are shown in Table 9.5.

Table 9.5: Retail price increases from carbon tax of €20 per tonne CO<sub>2</sub>, 2009

Fuel	Price including existing tax €	Price including existing tax plus carbon tax €	Price increase Carbon tax €20 per tonne CO <sub>2</sub>	
			€	%
Premium unleaded gasoline 95 RON (litre)	0.986	1.033	0.047	4.8%
Auto diesel - non commercial user (litre)	0.975	1.029	0.054	5.5%
Natural gas - household (kWh)	0.0643	0.0684	0.004	6.4%
Light fuel oil - household (1,000 litres)	610.17	663.84	53.67	8.8%
Briquettes (bale)*	3.85	4.33	0.48	12.5%
Premium domestic coal (tonne)*	405.00	461.32	56.32	13.9%

\* Price at 1 April 2009

Source: ESRI (July 2009)

### Recommendation 9.1.3

- The tax rate should approximate the ETS price of carbon.
- The price should be established annually, on a recognised market place for trading carbon credits.
- A floor price for carbon should be set.

### Component [4]: Possible phase in of tax rate

We are asked in our terms of reference to have regard to the commitment in the Programme for Government requiring that a carbon levy would be phased in on a revenue neutral basis. A number of submissions to us suggested that the tax should be *phased in* to allow consumers time to adjust. This might involve, for example, identifying alternative energy sources, or putting systems in place to account for the tax.

We considered a number of options in relation to phase in. The possibility of a carbon tax has been well publicised. If the tax were to be phased in, we concluded that a two-year period provided an appropriate balance between (a) offering an incentive to reduce emissions/switch fuels and (b) giving time to consumers to adapt/innovate/reduce the impact of the tax. The Revenue Commissioners indicated to us that a two-year time scale seemed reasonable in principle to prepare administratively and legislatively for the tax.

The practical value of phasing in a tax which will not have an appreciable impact on prices is questionable. It was shown in Table 9.5 that a carbon tax of €20 per tonne of CO<sub>2</sub> emitted would, for example, add five cent to the cost of a litre of petrol, on the prices given in the table. We suggest that 'time to adjust' is not necessary in this case. On the other hand, if the international price of carbon increased substantially, a gradual phase in period – perhaps longer than two years, would be appropriate.

Phase in periods for certain sectors (e.g. consumers but not business, or *vice versa*) was also considered, but we decided it would be too complex administratively. We concluded that, if the

impact of the tax on prices is insignificant, and if adequate safeguards are in place to deal with fuel poverty, then a phase in of the tax is not necessary.

#### Recommendation 9.1.4

Any phasing in of the tax rate should depend on the scale of the price.

#### Component [5]: Collection of the tax

We recommend that the carbon tax is imposed when the fuel goes into the market (as opposed to when it is sold to final consumers). This minimises the number of tax collection points, because taxpayers are limited to 'upstream' suppliers and producers. Discussions with the Revenue Commissioners confirm that such a system allows for alignment with existing excise duties, which is straightforward and cost effective.<sup>15</sup>

For example, if the carbon tax is imposed at the same time as mineral oil excise duty, it can be collected simultaneously, leading to administrative efficiencies. New collection arrangements will need to be put into place for fuels – peat and natural gas – which are not subject to excise duties.

Collecting the tax with excise duty upstream makes it less transparent, since it would be linked to another tax. This means that there is not an immediately apparent link between the tax and the amount of pollution caused. Accordingly, an important part of our proposal is that the carbon tax component should be made clearly visible at the point of final consumption. It is important to promote the idea that the carbon tax is not 'just another tax', but is designed to change behaviour.

Other evidence supports this proposition. For example, the initial proposals for a plastic bag levy was that it be imposed upstream, and absorbed by the retail outlets, which would, it was presumed, adjust. But the decision was made to shift the incidence downstream to the shopper, so as to make the link directly between plastic bag usage, environmental impact and consumer behaviour.

A drawback to an upstream approach is that small distributors/suppliers with slow stock turnover (for example, anthracite), who have to pay the tax upfront before collecting it from customers, may be particularly hit by cash flow issues. We propose that these be accommodated if practicable.

#### Recommendation 9.1.5

- The carbon tax should be collected at the earliest practical point of supply and linked into the existing mineral oils tax system where appropriate.
- The carbon tax should be clearly visible at the point of final consumption to ensure it is not seen as 'just another tax'.
- Working capital problems caused to small distributors/suppliers with slow stock turnover by the imposition of a tax at the earliest point of supply should be accommodated where practicable.

#### Component [6]: Possible preferential tax rates

Subject to the caveat below about negotiated agreements, our recommended default rule is that there will be one carbon tax rate, with no difference between sectors of the economy. Such a system is easy to understand and administer. Claims that some sectors are being favoured or unfairly treated are avoided.

<sup>15</sup> We have been advised that, under the EU Energy Tax Directive, natural gas must be taxed at the time of supply to the consumer. We understand that this is the most efficient and accountable method of taxation for that particular fuel.

We considered having a sliding scale of rates. While this would mean that particular problems faced by certain sectors could be addressed, by its nature such a system could become extremely complex. Questions such as fair treatment, the extent of exemptions, levels of proof needed to qualify for special rates all arise. The pressure to exempt sectors would probably be intense. In addition, if the rate for a 'preferential' sector was too low, there may be no change in behaviour, putting the burden of meeting Ireland's emissions reduction targets on other sectors.

Notwithstanding the default rule, the carbon tax design should allow for the possibility that companies with legally binding action-based and/or target-based emissions reduction agreements with Sustainable Energy Ireland (SEI) could be accommodated. There is some evidence to suggest that negotiated energy agreements (NEAs) are an effective method of reducing emissions – they have been used successfully in Denmark, for example. In addition, documentation from SEI indicates that emissions reductions double when there are binding negotiated agreements in place<sup>16</sup>.

Negotiated agreements address concerns about competitiveness. They recognise the fact that individual businesses have different emissions profiles and input combinations and are affected in different ways by carbon tax. A number of submissions also supported exemptions for firms participating in agreement schemes.

The Energy Tax Directive (see section 3.1) includes provisions for optional tax relief for, among other things, fuels used by companies undertaking energy efficiency measures. The proposed exemption from carbon tax for companies with NEAs appears to be in conformity with this. We recommend that any exemptions that may arise from restructuring of the Energy Tax Directive in the future should also be taken into account, as they may need to be dovetailed with the carbon tax.

The mechanism for accommodating companies with negotiated agreements might involve exemptions, special rates, or rebates. Precise details on these mechanisms are outside the scope of the design. We suggest that the scope of the reliefs which might be granted should be framed in the context of measures agreed under the Energy Tax Directive, in order to protect Ireland's competitiveness.

#### Recommendation 9.1.6

- In general, there should not be preferential rates of carbon tax.
- Binding action-based and/or target-based monitored agreements to reduce emissions should be accommodated under the carbon tax design.

### Component [7]: Treatment of EU ETS participants

The EU ETS covers over 100 installations (70 companies) in Ireland. We propose that EU ETS participants would not be liable for the additional carbon tax, since such companies are already facing a price for carbon which incentivises adopting abatement measures to reduce emissions and/or purchasing emissions allowances. Imposing a carbon tax on Irish ETS participants may create an incentive for Irish companies to reduce emissions/fuel switch even further (at the cost of increased prices). However, the net effect on EU emissions would be zero, because the EU ETS places a cap on total EU emissions. The system involves surplus permits being sold on to a purchaser who can then emit instead. This total is not affected by a carbon tax in Ireland.

16 See, for example: [http://www.sei.ie/Publications/Your\\_Business\\_Publications/Energy\\_Agreements/Pilotexecsumm.pdf](http://www.sei.ie/Publications/Your_Business_Publications/Energy_Agreements/Pilotexecsumm.pdf) for summary details on a pilot scheme run by SEI in 2003.

The distribution of emissions across Member States would be affected however (as Irish ETS companies subject to a carbon tax would reduce emissions and buy fewer permits).

Several submissions to us also expressed the view that ETS companies should not have to pay carbon tax. In addition, the Energy Tax Directive allows for tax relief for energy products used by companies involved in the emissions trading scheme.

The precise details on how such installations might be exempted in practice are an administrative matter – the Revenue Commissioners have indicated that the tax warehouse system and/or operating a refund scheme for all ETS companies would be feasible.<sup>17</sup>

### **Tax treatment of permits allocated to ETS participants**

Companies involved in emissions trading were given a free allocation of permits for the 2008 to 2012 trading period. The argument was put to us that this free allocation should be taxed because it amounted to a subsidy to ETS participants. Another argument for taxing free permits is the fact that a polluting ETS company may trade its permits in an economic downturn (because production, and hence emissions, have decreased), whereas a 'green' competitor company outside the ETS does not have such a source of profits.

The dominant holder of allowances is the power sector<sup>18</sup>. With the emergence of the all-island electricity market, generators in the market post-2008 are expected, as a condition of their generation licences, to bid into the all-island wholesale market at prices that fully factor in their short-run marginal costs for each half-hourly dispatch period.

Such costs explicitly include the full opportunity cost<sup>19</sup> of the permits for each half-hour period<sup>20</sup>, a provision which did not apply during the pilot (2005-07) phase. Thus we would expect in fully competitive markets that the value of allowances will be included in the price consumers pay for their electricity. If allowances are granted for free, this means that generators accrue a windfall gain. It was this consideration that led countries such as Germany and the UK to auction up to 10% of the allowances in the 2008-12 period, so as to claw back some of this gain.

If pass through were operating in Ireland, it has been estimated that the value of the gain would be in the range of €400 to €600 million over the period.<sup>21</sup> However, there are particularities in the Irish situation, including:

- The fact that the major incumbent – ESB – is State owned, and some of the gain is captured by the shareholder
- Retail electricity prices are still influenced by regulation
- The Government is attempting to encourage new entrants, and a windfall tax would not be helpful in this context, and

17 A tax warehouse is an approved premises where excisable products (or in this case, fuel subject to carbon tax) may be produced and stored under 'duty suspension' arrangements, whereby tax is not payable.

18 The other major beneficiary of free allowances is the cement sector. However, market conditions are such that competitive pressures are likely to inhibit the potential for pass through of the value of allowances.

19 'Opportunity cost' is the value foregone in using an asset and is independent of whether one paid for it or not. Although emitters get these valuable allowances for free, they will still recognise their full value as they make decisions.

20 See: *All Island Project – the Bidding Code of Practice – A Response and Decision Paper* AIP-SEM 07-430, 30 July 2007.

21 See: Ryan, Lisa, Convery, Frank and Casserly, Noel, 2008. 'Mobilising Market-based Instruments for Climate Change in Ireland' Budget Perspectives 2009. Editor Tim Callan, ESRI, 2008.

- There is a Government decision for the ESB to be a leader in the development of the 'green economy' including the areas of smart meters, smart networks, electric vehicles, wind energy, home insulation and green technology, all of which require capital

Given this wider energy policy framework, it did not appear sensible to us to proceed with a recommendation that the gain from these permits would be taxed at this time. A further consideration is the fact that all of the power sector participants will be buying their permits at auction from 2013, when the amended Emissions Trading Scheme comes into operation<sup>22</sup> and this revenue will accrue to the Irish Exchequer. We conclude that the tax treatment of permits that are given free to participants in the ETS is a complex, technical issue. While we accept that in principle, such permits should be taxed in order to capture the gain to the beneficiaries, we do not recommend such a course at this time. It may, however, be appropriate in the future.

#### Recommendation 9.1.7

- Carbon tax should not apply to ETS participants.
- Tax should not be imposed at this time on ETS participants in order to capture the gains they made from the free allocation of permits; the issue should be monitored and taxation may be appropriate in the future.

### Component [8]: Administration rules

We propose in component [5] that the new carbon tax would be aligned with the existing mineral oil tax provisions in terms of point of charge and collection procedures. We also recommend that the legislative framework – including the rules for filing of returns by persons liable, for making payments, for interest, for determining when exactly a supply is made, and for appeals – should follow existing provisions in the tax code where possible.

Some new administrative rules may also be needed – for example, it might be decided that a minimum liability threshold should apply before the tax on carbon arises. In practice, this would mean that suppliers would not have to register and file returns unless some pre-determined tax liability amount was reached. While this allows for the fact that administrative and compliance costs in the case of some very small suppliers may limit the cost effectiveness of the tax, we recognise that there may be monitoring and control issues – enforcement, setting the threshold amount, and so on. We do not object in principle to the setting of threshold amounts.

#### Recommendation 9.1.8

Administrative rules for the carbon tax should fit in with existing tax provisions where practicable.

## 3.4 Other greenhouse gases

Greenhouse gases other than CO<sub>2</sub> account for approximately 32% of Ireland's total emissions (2007 figures), and are much more harmful to the environment than carbon dioxide. Tax initiatives which lead to emissions reductions in these gases, which cover methane, nitrous oxide and the three F-gases, would contribute to meeting Ireland's international climate change commitments, and our terms of reference on fiscal measures to protect the environment.

22 The power sector will be subject to auction immediately. Full auctioning of permits has been delayed for other sectors, following agreements at EU level in December 2008. Also see 'Obligations after 2012' in section 3.2 of this Part.

Summary statistics in relation to each of the gases are provided in the following table:

Table 9.6: Other greenhouse gases in Ireland, 2007

Gas	Main sources	Global warming potential*	% total emissions	Potential Yield €m**
CH <sub>4</sub> (methane)	Agriculture, waste.	21	19%	250
N <sub>2</sub> O (nitrous oxide)	Agriculture, energy.	310	12%	150
HFCs group (F-gas)	Fire extinguishers, semiconductor manufacture, refrigeration and air conditioning equipment, foam blowing, aerosols/metered dose inhalers.	From 140 to 11,700	1%	19
PFCs group (F-gas)	Semiconductor manufacture.	From 6,500 to 9,200		
SF <sub>6</sub> (F-gas)	Semiconductor manufacture, electrical equipment, medical applications, sporting goods, double-glazed windows.	23,900		

Sources: Environmental Protection Agency (EPA) National Inventory Report 2009; Economic and Social Research Institute (ESRI).

\* Global warming potential is one of the measures that can be used to compare the potency of gases relative to carbon dioxide (which has a GWP of 1).

\*\* ESRI estimates of potential yield are based on a tax of €20 per tonne of CO<sub>2</sub> equivalent and are taken from 'A carbon tax for Ireland' 23 May 2008. Tol, R., Callan, T., Conefrey, T., Fitzgerald, J., Lyons, S., Malaguzzi Valeri, L. and Scott, S.

The submissions to us and discussions held with interested bodies were mixed on the question of whether other greenhouse gases should be taxed. On the one hand, there was support for the view that the carbon tax should apply to all six greenhouse gases as part of a coherent climate change policy. On the other hand, concern was expressed about whether taxing these gases would bring Ireland into uncharted waters, and damage our competitive position, since other jurisdictions did not, in general, impose such taxes.

An overview of our analysis of the taxation of these gases is presented in Box 9.7.

*Box 9.7: Pros and cons of taxing other greenhouse gases in Ireland***Case for a tax:**

- The relative contribution of methane (approx. 19%) and nitrous oxide (approx 12%) to total emissions suggests that these gases are too important to ignore in terms of meeting Ireland's emissions reductions targets. Also, methane contributes over 40% of emissions in the non-trading sector, where the potential application of a tax is most relevant and salient
- A tax would give the right signal at EU level and show Ireland's commitment to climate change
- Significant potential revenue yield in the case of taxing methane (€250 million) and nitrous oxide (€150 million) – see Table 9.6
- Treating all greenhouse gases the same is more equitable and does not place Ireland's emissions reduction burden on certain sectors only
- HFCs, PFCs and SF<sub>6</sub> are growing fast and are very potent

**Case against a tax:**

- Principle of synchronisation with the EU ETS – agricultural emissions are not currently capable of being accurately monitored, reported and verified
- International competitiveness issues and the uncertain effects on the Irish economy: such taxes would put Ireland at a disadvantage in relation to other countries and lead to businesses relocating
- Greenhouse gas leakage: such taxes could result in herd cuts in agriculture, and encourage businesses to move abroad without achieving any overall emissions reductions, because the activity continues to be carried out elsewhere
- The level of food consumption in Ireland would not be influenced by the tax; thus the decline in food production in Ireland would be replaced by food produced elsewhere in the world, resulting in no overall reduction in emissions and adding further emissions from additional transportation
- Alternative technologies and feeding systems to reduce greenhouse gas emissions from agriculture are currently being developed
- There are already a number of EU regulations on the control of the F-gases. Support for EU-level focus on non-tax measures – prohibition, regulation and technological change – could better signal Ireland's commitment to international climate change policy
- The low potential tax yield (about €20 million) and effect on emissions for the F-gases does not warrant a tax

We examined proposed amendments to the EU Emissions Trading Scheme in the context of the other gases. The existing scheme covers certain CO<sub>2</sub> emissions only. Post-2012 it is intended that the scheme will also cover:

- CO<sub>2</sub> emissions from petrochemicals, ammonia and aluminium
- N<sub>2</sub>O emissions arising from the production of nitric, glyoxalic and adipic acid, and
- PFCs from the aluminium sector

The EU Commission indicates that the inclusion of these sectors and gases is feasible because they can each be measured with sufficient accuracy. Specifically, the proposal to amend the Directive states that:

*“The emissions trading scheme should only be extended to emissions which are capable of being monitored, reported and verified with the same level of accuracy as applies under the monitoring, reporting and verification requirements currently applicable under the Directive. This ... is not the case for emissions from agriculture or forestry.”*

It was noted in Component [1] of the carbon tax proposal that we agreed, as a general principle, that emissions factors used under the EU ETS should also be used for measurement purposes for the carbon tax on fossil fuels. We also adopted the principle that our carbon tax proposal should be in symmetry, as far as possible, with the EU ETS in terms of coverage.

We concluded that a carbon tax should not be imposed in respect of methane and nitrous oxide emissions from agriculture. This is in keeping with the principle that the carbon tax proposal should synchronise where appropriate with the EU ETS; such emissions are excluded from the EU ETS because they cannot be accurately monitored, reported and verified. This course is being proposed for reasons of practicality. The Commission is strongly of the view that, on environmental grounds, it is undesirable in principle to exempt a sector that is a very substantial contributor to emissions. If the monitoring, reporting, verification situation were to improve to the point that inclusion was feasible, the issue should be reconsidered.

We also decided against taxing the F-gases. Our examination of the F-gases indicated that the trend across Europe in relation to consumption and emissions reduction has focused on prohibitions, regulation and technological change, rather than taxation.

Our remit in relation to carbon tax includes examining how best the tax system can support economic activity and increase employment. Ireland is a small open economy. We concluded that imposing a tax on the industries affected, particularly when other countries did not have similar measures, would not be prudent - the tax take would be insignificant, and the damage to the economy could be high, if such businesses chose to relocate to other jurisdictions. The preferred approach is to conclude voluntary agreements with business, and to foster producer initiatives and negotiated agreements.

#### **Recommendation 9.2**

Research into measures to reduce agricultural emissions – such as alternative technologies and feeding systems – should continue and be intensified.

#### **Recommendation 9.3**

If methane and nitrous oxide emissions from agriculture become capable of being monitored, reported and verified with sufficient accuracy, their exclusion from the carbon tax should be reconsidered.

## Section 4:

### Other environmental taxes/fiscal measures

#### 4.1 Introduction

The targeting of greenhouse gas emissions via a carbon tax is just one element of our remit. Our terms of reference cover fiscal measures to protect and enhance the environment generally. In this section, we examine measures that might be taken to counteract environmentally-damaging products other than carbon, and to promote energy efficiency and environmentally clean means of transport.

Market pricing mechanisms in relation to water and waste water services, and to the control of waste, are two other significant areas in the context of maintaining a sustainable environment. We analysed these factors as part of our remit to examine the future financing of local government.

*Full details of our findings and recommendations on water, waste water and the control of waste are in Part 11 of our Report.*

#### 4.2 Environmental product taxes

The purpose of taxing environmentally damaging products (such as batteries, tyres or excess packaging) is to provide an economic incentive to reduce their production or consumption. The 'plastic bag tax' is an example of a highly successful product tax in Ireland (see Box 9.2).

The definition of environmental product tax is potentially very wide. It could include, for example, the tax on carbon in fuels already proposed, as this is a tax on a product that could be deemed damaging to the environment. We based our analysis on the categorisation adopted by the European Environmental Agency (EEA). The EEA lists the following items under the 'products' category in its 2006 report on market based instruments for environmental policy<sup>23</sup>:

*Tyres, beverage containers, packaging, bags, pesticides, CFCs, batteries, light bulbs, PVC/phthalates, lubrication oil, fertilisers, paper/board and solvents.*

We developed a set of general criteria under which product taxes might be imposed. These were formulated according to the relevant principles set out in section 2.2 and are presented in Box 9.8.

##### *Box 9.8: Criteria in relation to the imposition of environmental product taxes*

###### **Product taxes should only be imposed if:**

- Voluntary agreements, underpinned by regulation where appropriate, have been unsuccessful or have not been applied\*
- The tax is likely to be environmentally effective: the user has an alternative to the pollutant; the tax is expected to change behaviour, and there is a measurable behavioural response
- The administrative burden is not excessive
- The collection costs are not excessive in relation to the expected yield

*\* For example, in the case of packaging, there are no voluntary agreements in place that cover the generation of waste in the first instance.*

23 The other EEA categories are air/energy (which includes carbon taxes), transport, water, waste, noise and resources [raw materials].

Proposals in relation to environmental product taxes did not feature significantly in either the submissions we received or the discussions we held with relevant bodies on environmental issues. There was some support for the imposition of economic disincentives on the producers and distributors of unnecessary packaging. It was also suggested to us that it was important that retailers were not faced with the daily administration of a multitude of different environmental levies or charges. The efficacy of non-tax environmental policy instruments – such as information campaigns and voluntary agreements – also came up during the consultation process.

We examined a number of programmes in this area. Examples of our findings include the following:

- Successful industry-led initiatives have been introduced for packaging – where rates of recovery and recycling significantly exceed EU targets – and tyres. There is no fiscal, voluntary or other policy designed to reduce the creation and use of packaging. A prominent scheme is the implementation on the basis of producer responsibility of the Waste Electrical and Electronic Equipment (WEEE) Directive, whereby at time of purchase, consumers are separately charged the environmental management costs of final disposal, and these contributions to the producer recycling fund are used to safely recycle or dispose of such equipment
- There are also schemes for end-of-life vehicles (typically, passenger cars or light commercial vans that the registered owner wishes to dispose of); farm plastic waste; and (since September 2008) batteries. In most cases, these recycling schemes are underpinned by EU Directives and domestic legislation
- The Department of the Environment, Heritage and Local Government has concluded a negotiated agreement with the chewing gum industry, covering initiatives over the period 2007–2009. This includes information campaigns and an R&D grant funded by the industry. That Department has also agreed a protocol with the Irish Banking Federation (IBF), acting on behalf of retail banking groups with ATM networks, to tackle litter caused by ATM advice slips. The Department is also undertaking negotiations with the take-away sector to deal with fast food packaging
- In addition, there is a wide range of EU legislation, which has been transposed into Irish law, that addresses issues such as chemical and pesticide management, water and air quality and the protection of waters against pollution caused by nitrates from agriculture<sup>24</sup>

Environmental product taxes may not always be the most appropriate answer to an environmental problem. Regulation and/or voluntary initiatives may be more appropriate options, and this is the way that environmental policy vis-à-vis products is developing in Ireland. In the light of the criteria outlined at Box 9.8 and the analysis undertaken on this issue, we do not recommend that new product taxes be introduced at this stage. Our preferred approach is the agreement of voluntary initiatives in the first instance. However, if the agreements approach now evolving proves in some instances to be ineffective – for example, if there is no change in behaviour after a suitable time period has elapsed – then a tax should be considered.

#### Recommendation 9.4

- Environmental product taxes should be considered where voluntary initiatives are unsuccessful.
- If such taxes are to be considered, the criteria developed by us (see Box 9.8) should be met.

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For example, implementation of the Nitrates Directive in Ireland has included monitoring of waters by local authorities and the EPA, the development of a code of practice to protect water from pollution by nitrates, a range of actions to support good agricultural practice (for example, farm inspections by local authorities; grant assistance to farmers under the Farm Waste Management Scheme, Rural Environment Protection Scheme (REPS) and advisory schemes; EU-supported investment in farm waste management facilities) and the development of a nitrates action programme and regulations.

### 4.3 Energy efficiency

There is a large body of evidence to suggest that investment in energy efficiency is a cost effective way of reducing carbon emissions and improving the environment. The EU Commission's Action Plan for Energy Efficiency (2006) indicates that realising the Community's savings potential is a key element in EU energy policy, and

"... is by far the most effective way concurrently to improve security of energy supply, reduce carbon emissions, foster competitiveness and stimulate the development of a large leading-edge market for energy-efficient technologies and products".

The Action Plan suggests that the adoption of cost effective energy-saving measures would enable the EU to cut its energy use by over 20% by 2020. This includes reductions in CO<sub>2</sub> emissions of some 780 million tonnes (over 2005 baseline levels), which is more than twice the reductions needed by 2012 under the Kyoto Protocol. The Plan points out that the estimated savings would more than compensate for the additional investment expenditure in more efficient and innovative technologies. The EU Commission's estimates for full energy-saving potential by sector are summarised in Table 9.7. The largest potentials lie in residential households and commercial buildings – retrofitted wall and roof insulation (housing); improved energy management systems (commercial buildings); motors, fans and light (manufacturing) are noted as offering significant energy-saving opportunities. Savings in the transport sector include the impact of shifting to other traffic modes.

Table 9.7: Estimates for full energy saving potential, EU-25 by end-use sectors

Sector	Energy consumption (Mtoe) 2005	Energy consumption (Mtoe) 2020 business as usual	Energy savings potential 2020	
			(Mtoe)	%
Households (residential)	280	338	91	27%
Commercial buildings	157	211	63	30%
Transport	332	405	105	26%
Manufacturing industry	297	382	95	25%

Source: European Commission, 2005

Mtoe = million tonnes of oil equivalent. Energy savings potential for 2020 includes savings due to price effects, structural changes, natural replacement of technology and measures already in place.

Fiscal measures consist of changes to the tax base, tax rates or tax rules. In the context of energy saving this involves, for example:

- Tax breaks (such as incentives to encourage businesses to buy machinery that is more energy-efficient; tax credits for householders who insulate their homes), and
- Differentiation of tax rates (such as lower rates of tax in respect of purchases of greener houses or environmentally friendlier goods)

The Government's *Energy Efficiency Action Plan* was issued in May 2009, and reflects in Ireland the opportunities available at EU level.<sup>25</sup> Energy efficiency opportunities (in terms of reduction in energy use and carbon emissions) are identified for different sectors. Those that are of possible relevance in regard to tax intervention (regulation interventions are excluded) are shown in Table 9.8.

Table 9.8: Energy efficiency opportunities

Sector	Energy reduction in GWh	KtCO <sub>2</sub> reduced
<b>Business and Public Sectors</b>		
SEI large energy agreements	4070	887
SEI small business supports	565	141
Renewable heat deployment	410	92
Accelerated capital allowances for energy efficient equipment	800	143
<b>Residential</b>		
Warmer homes (lower income households)	170	42
Home energy saving scheme (retrofit)	600	157
Greener homes (renewable)	265	64
Lighting	1200	210
Efficient boiler standard	2400	585
<b>Transport</b>		
Improved fuel economy of private car	1530	412
Electric vehicle deployment	955	350
VRT/motor tax changes	200	54
E working	150	40
<b>Energy Supply</b>		
Winter peak demand reduction	55	10

Source: Energy Efficiency Action Plan, Department of Communications, Energy and Natural Resources, May 2009, pp10-11  
GWh is a unit of electrical energy equal to a gigawatt hour (109 watt hours).

KtCO<sub>2</sub> is 1,000 tonnes of CO<sub>2</sub>.

In addition to the above, it is estimated that there are huge opportunities in the existing housing stock for retrofit intervention, comprising (number of units shown in brackets) attic insulation (500,000), cavity wall (62,000) and wall-lining (120,000) which would yield energy savings of 2,690 GWh per year, contributing over 8% of the 32,000 GWh reduction that Ireland is legally obliged to achieve by 2020.

Energy efficiency was a topic that featured strongly in our consultation process. We considered it to be a priority area for examination, as the ratio of benefit-to-cost was very high. We examined accelerated capital allowances for 'green' business equipment, favourable VAT rates for environmentally friendly goods, and mandatory energy reduction programmes for business.

### Energy-efficient equipment in business

A scheme of accelerated capital allowances for companies purchasing certain 'green' equipment was introduced in the Finance Act 2008 and expanded in the Finance (No. 2) Act 2008. Eligible companies under the scheme are entitled to claim a 100% write-off of the cost of acquiring the energy-efficient equipment in the year in which the expenditure is incurred, compared with a 12.5% write-off over eight years, which is the normal rule for plant and machinery. Box 9.9 provides summary details.

#### *Box 9.9: Accelerated capital allowances (ACA) for energy-efficient equipment*

##### **Product taxes should only be imposed if:**

- Introduced in Finance Act 2008 for certain energy-efficient equipment bought by companies for use in their trade
- Applies to new equipment which:
  - Belongs to a category of technology defined in the legislation
  - Is on a list approved by the Minister for Communications, Energy and Natural Resources and maintained by Sustainable Energy Ireland
- Three categories introduced in Finance Act 2008 - motors & drives; lighting; building energy management systems. Four additional categories introduced in Finance (No. 2) Act 2008 – data server systems (ICT); heating and electricity provision; heating, ventilation and air conditioning systems; electric and alternative fuel vehicles
- Certain minimum expenditure limits apply for each category
- Scheme applies to equipment bought up to the end of 2010

We examined the accelerated capital allowances (ACA) scheme as part of our review of tax expenditures. We concluded that the measure should continue for its current term, and that it should be evaluated in accordance with our criteria for tax expenditures before any extensions are considered. See Part 8 of our Report for details.

We examined similar schemes in operation in the UK (since 2001) and in the Netherlands (since 1991). Under the Dutch provisions, the equipment or asset must not be in common use (where 'common use' is defined as having a market penetration of 30% or over), in order to provide an incentive for the development of new technology. An evaluation undertaken in the Netherlands in 2005 indicates that about 60% of the technologies on the list had been sponsored by the Government in an earlier phase of development under an R&D programme. This suggests that the accelerated depreciation scheme complements the R&D programme by encouraging the shift to new technology.

A limitation of the existing ACA provision in Ireland is that it does not encourage innovation and associated enterprise and job creation – only technologies from an approved list qualify. As the R&D programme focused on energy supply and energy efficiency develops, we recommend that the Dutch model of differentially favouring innovation should be seriously considered.

### Differential VAT rates for "green" goods and services

A commitment to examine the reduction of VAT on certain environmental goods and services was included in the Programme for Government and was examined as part of our analysis of energy

efficiency. This would involve moving items that are currently standard-rated (now 21.5%) down to the 13.5% category. A lowering of the rate on 'green' items is not possible under existing rules<sup>26</sup>. However, a proposal to examine amendments to the EU VAT Directive in order to reduce VAT on environmentally friendly goods (such as energy-efficient light bulbs and insulation materials) was instigated by France and the UK in March 2008. We recommend that Ireland should support this initiative at EU level.

### **Mandatory energy reduction programmes for business**

Fiscal incentives to increase energy-saving measures in businesses have been implemented successfully in Europe. We note in component [6] of our carbon tax proposal that negotiated energy agreements have been successful in reducing emissions<sup>27</sup>. We propose that businesses should be accommodated under the carbon tax scheme if they participate in an approved mandatory energy reduction scheme, based on Sustainable Energy Ireland's Energy Agreements Programme<sup>28</sup>.

Tax is just one of several policy instruments used to promote energy efficiency. Non-fiscal measures include:

- Regulation (there is a comprehensive body of EU legislation on improving energy efficiency in products, buildings and services<sup>29</sup>)
- Information campaigns to improve energy awareness
- Financial incentives in the form of loans and grants to promote the purchase of green products

We conclude that, in relation to energy efficiency, non-fiscal measures including the direct expenditure route are more appropriate in many cases. We do, however, propose the development of the accelerated capital allowance scheme, amendments to the VAT regime, and accommodation of non-ETS businesses, as indicated below.

#### **Recommendation 9.5**

Continue the Accelerated Capital Allowance for energy-efficient equipment scheme for its current term; evaluate the potential for expanding the scheme to incentivise innovation (based, for example, on the Dutch model).

#### **Recommendation 9.6**

Ireland should support amendments to the EU VAT Directive that would allow the implementation of lower VAT rates for energy-efficient goods and services.

#### **Recommendation 9.7**

Businesses that are not in the emissions trading scheme should be given a rebate on their carbon tax payments if they participate in an approved mandatory energy reduction programme.

26 There are two aspects. One, there is no scope under EU law to differentiate according to the environmental impact of a particular good or service - which means, for example that energy-efficient fridges can not have a lower rate than other fridges. Two, only goods and services listed in Annex III of the EU VAT Directive can have the reduced rate applied to them, which in practical terms means that the scope for change is restricted.

27 To take another example, under the UK climate change levy provisions companies were allowed an 80% reduction in their payment provided they entered an agreement to meet negotiated emissions reduction targets.

28 See: [http://www.sei.ie/Your\\_Business/Energy\\_Agreements/](http://www.sei.ie/Your_Business/Energy_Agreements/) for details.

29 Examples include the Eco-Design Directive, the Labeling Directive, the Energy Star Regulation, the Directive on Energy End-Use Efficiency and Energy Services and the Energy Performance of Buildings Directive.

## 4.4 Transport

Transport-related greenhouse gas emissions are one of the fastest growing sectors outside the emissions trading scheme. Significant improvements have been made since the 1990s in relation to fuel efficiency, resulting in substantial reductions in average emissions per car – from 3.70 tonnes of CO<sub>2</sub> in 1990 to 3.44 tonnes in 2005 (industry estimates). However, these reductions have been more than offset by the growth in the fleet over the same period.

Any sustainable developments in transport require measures to influence and change personal travel behaviour. This is recognised in the Government's Transport Policy for Ireland 2009 – 2020<sup>30</sup>, which proposes the following in relation to taxation:

“In the context of the Commission on Taxation Report due in 2009 we will consider the application of fiscal measures aimed at reducing car use and achieving a shift to alternative modes of transport, which will ease congestion, reduce further transport emissions and take into account economic competitiveness and social inclusion. Where necessary, we will carry out research to ensure effectiveness of this action.”

Our analysis of fiscal measures in the transport sector was undertaken against the backdrop of the Transport Policy, which covers the period up to 2020. We support the introduction of fiscal measures aimed at reducing car use, as indicated above.

### Existing transport taxation system

Currently, the tax treatment of motor transport comprises:

- a) Once off purchase tax: vehicle registration tax (VRT)
- b) Annual charge: motor tax, regardless of usage level
- c) Usage charge: auto fuel taxes, comprising excise duty and VAT
- d) Fiscal measures to encourage more environmentally friendly travel

### Existing system – (a) VRT on car purchase

Vehicle registration tax (VRT) applies to new and used imported vehicles. Vehicles must be registered before they can be licensed for road tax purposes. The 'rebalancing' of VRT, under which the basis for assessing the tax is more aligned with CO<sub>2</sub> emissions, was introduced with effect from July 2008. Similar environmentally-friendly changes were introduced for motor tax and for business cars (capital allowances and leasing expenses). Summary details are shown in Box 9.10

Box 9.10: Rebalancing of motor charges to take account of CO<sub>2</sub> emissions

1. **Old system:** Tax based on engine size.
  - Main VRT categories (A1 = Cars up to 1,400cc, tax 22.5% of Open Market Selling Price; A2 = Cars 1,401 to 1,900cc, tax 25% of OMSP; A3 = Cars over 1,900cc, tax 30% of OMSP).
  - There was a minimum VRT tax of €315 on passenger cars. 50% VRT reduction for hybrid-electric and flexi-fuelled bio-ethanol mix vehicles.
2. **New system:** Tax based on emissions.

Band	2007	2007	2007	2007	2007
A	Up to and including 120g CO <sub>2</sub> per km	14%	€100	At CVT*	At CVT
B	More than 120 – 140g	16%	€150		
C	More than 140 – 155g	20%	€290		
D	More than 155 – 170g	24%	€430	Lower of 50% CVT or car cost	50% of amount available pre July 08
E	More than 170 – 190g	28%	€600		
F	More than 190 – 225g	32%	€1,000	Do not qualify	Do not qualify
G	More than 225g	36%	€2,000		

\* CVT = car value threshold, currently €24,000.

- A CO<sub>2</sub> emissions labelling system for cars, similar to the energy efficiency labels for white goods, underpins the new rules
- Hybrid electric and flexible fuel cars get relief of up to €2,500 on the VRT payable under the new system
- Electric cars and motor cycles have been exempted from VRT from 1 January 2008; exemption expires end-2010
- Electric cycles are exempt from VRT (as they are exempt from registration)

### Existing system – (b) Annual motor tax

Motor tax rates have also been rebalanced, to align them with the emissions rating of the vehicle (see Box 9.10).

Cars under the pre-July 2008 motor tax system continue to be taxed based on engine size (cc). New cars registered from July 2008 are taxed based on CO<sub>2</sub> emissions level. New low CO<sub>2</sub> emitting cars purchased in the first six months of 2008 were switched to the CO<sub>2</sub> system on first renewal of motor tax after 1 July 2008. (Motor tax receipts are paid into the Local Government Fund, as opposed to the Exchequer.)

### Existing system – (c) Auto fuel taxes

The cost implications of changing excise duty rates and the effects on the consumer price index (CPI) have been estimated as follows:

Table 9.9: Yield and CPI effects of changing excise rates

Cost of Increases (VAT inclusive)	1 cent	2 cent	3 cent	4 cent	5 cent	10 cent
Petrol: Cost €m	18.9m	37.4m	55.7m	74.1m	92.3m	182.7m
CPI (%)	.024	.047	.071	.094	.118	.236
Diesel: Cost €m	19.7m	39.4m	58.9m	78.4m	97.8m	193.5m
CPI (%)	.007	.013	.020	.026	.033	.065

Source – Department of Finance post Supplementary Budget 2009 figures

Excise duty and VAT amount to well over 50% of the Irish retail price of petrol and diesel. Excise duty is a specific tax (i.e. a rate per unit). This means that, as the price increases over time, the percentage of the price accounted for by excise duty will fall. VAT is an ad valorem tax (i.e. applied according to the value of the product). VAT is applied to the final pre-VAT price. This means that VAT receipts increase as prices increase, even if there is no change in rate. Ireland has low excise rates relative to our main trading partners, particularly the UK. Differences in tax rates between here and Northern Ireland may induce cross-border fuel tourism but this depends also on the euro-sterling exchange rate.

At 1 January 2009, our excise rates for diesel (€368.05 per 1,000 litres) and petrol (€508.79 per 1,000 litres) were about average across the EU – see Table 3.10 in Part 3 of our Report.

Table 9.10 shows the price and excise duty differentials between Ireland and Northern Ireland for petrol and auto diesel, using results from a cross border survey of June 2009.

Table 9.10: Cross border comparison – motor fuel (rates in €) June 2009

	ROI Price	ROI Excise	N.I. Price	N.I. Excise	Price Differential	Excise Differential
Petrol (litre)	1.21	0.51	1.28	0.64	-0.07	-0.13
Auto-diesel (litre)	1.07	0.41 *	1.24	0.64	-0.17	-0.23

Source – Cross Border Price Survey 24 June 2009 – the Revenue Commissioners

\* The diesel rate increased from €368.05 to €409.20 per 1,000 litres in Budget 2009.

### Existing system – (d) Tax measures to promote environmentally friendlier travel

In addition to the rebalancing of VRT and motor taxes, there are a number of other provisions in the tax code in relation to the promotion of environmentally friendlier forms of transport and travel. Box 9.11 provides summary details.

*Box 9.11: Other tax measures to promote environmentally friendly travel*

- Tax incentives for alternative modes of transport:
  - The 'TaxSaver Commuter' ticket scheme (1999) under which employees receive bus or rail tickets either as part of their salary package, or in lieu of an annual bonus. Savings arise because tickets are not subject to tax or PRSI
  - The tax incentive to promote cycling to work (2009), under which the provision of bicycles by employers to employees for this purpose is treated as a tax exempt benefit-in-kind
- The excise relief scheme for biofuels (2006): This is aimed at reaching a 2% target for biofuels penetration of the transport fuels market (and CO<sub>2</sub> savings of over 250,000 tonnes per annum; details are in Box 9.3)
- Favourable VRT treatment: VRT exemption for electric cars and bicycles and reliefs from VRT of up to €2,500 for hybrid electric and flexible fuel cars (details are in Box 9.10)
- Workplace parking levies: Measure introduced in Finance (No. 2) Act 2008 involves a charge on free workplace parking. A charge of €200 per annum applies in the main urban areas to employees who use car parking facilities provided by their employer

**Proposed transport taxation system**

We propose restructuring the tax treatment of motor transport so that VRT on cars purchased is phased out over time, and tax on registration is replaced by a tax on motor usage. This would comprise (a) increased fuel charges (including the carbon tax on emissions) and (b) road pricing. We also support targeted measures aimed at reducing usage of environmentally-damaging cars, and recommend that consideration should be given to the introduction of a new VRT scrappage scheme in this context. We do not propose any further changes to motor tax.

**Proposed system – (a) abolition of VRT over 10 years**

Linking CO<sub>2</sub> pollution costs more closely to the actual creation of the pollution (i.e. car usage rather than car purchase, as is the case with VRT) is a fairer and more effective means of reducing CO<sub>2</sub> emission levels. It means that revenue is raised from persons actually using the transport infrastructure and energy supplies. The EU published a proposal for a Directive in 2005, supporting the gradual abolition of registration taxes (VRT) in favour of circulation taxes (fuel taxes) with a CO<sub>2</sub> element. It was contended, among other things, that the wide range of different systems across Member States impeded the proper functioning of the internal market. However, opposition from Member States (including Ireland) has meant that this proposal has not progressed.

In Ireland, it has been estimated that the impact of switching from VRT to increased excise on fuels (petrol and auto diesel) would require price increases of over 30 cent per litre (VAT inclusive) in order to maintain tax yield.

The CPI implications (excise duty would be immediately passed on to customers) and concerns about transport costs (increased excise on fuel would favour those that have low car mileage and transport companies operating in regions where fuel costs are lower) were among the reasons for Ireland's opposition to the proposal.

Our analysis of the issue indicated further problems with changing the system:

- Competitiveness issues with the freight industry, where fuel usage was higher (and where increased efficiencies were seriously needed)
- There was no easy way to deal with the existing fleet, on which VRT would already have been paid, but the changeover would still result in much higher fuel prices
- The prospect of 'reverse fuel tourism', where higher prices in the Republic might encourage motorists to purchase fuel in Northern Ireland, which would result in a loss of tax to the Exchequer
- Adverse impact on rural dwellers who do not have alternative means of transport available to them

Nonetheless, we consider that the VRT system does not properly deal with the ongoing demands on the transport system and that it should, over time, be replaced by taxes on usage. We suggest that a changeover period of 10 years would minimise the problems in relation to the existing fleet of tax-paid vehicles. It would also allow for a more gradual increase in the price of fuel, to preserve tax yield - in this context, we note that there would be a significantly reduced tax return for used car registration in the final years of the phasing.

The competitive impact on the haulage sector is an issue, and some industry specific scheme may be required to address this<sup>31</sup>.

The two elements of usage taxes are fuel taxes and road pricing (which could include congestion charges).

### **Proposed system – (b) increases in fuel taxes**

As noted above, increases in excise duty (and therefore, VAT receipts) would be needed to preserve the tax take if VRT were phased out. In addition, it is proposed in section 3.3 that a carbon tax on fuels should be introduced. Table 9.5 indicates that a carbon tax of €20 per tonne CO<sub>2</sub> would increase the price of petrol by five cents.

Definitive research in the area of excise duties on transport indicates that, in the long run, fuel demand is highly responsive to price changes. For example, Sterner (2007)<sup>32</sup> indicates that:

- A 10% increase in fuel prices will lead to a decrease in demand for fuel (and thus carbon emissions) by 7 – 8%
- The adjustment process may take more than 10 years to materialise (response to price is very low in the short-run)

### **Proposed system – (c) road pricing/congestion charges**

Box 9.12 summarises the key elements of road pricing and congestion charges schemes.

The national climate change strategy 2007–2012 indicates that consideration will be given to the introduction of fiscal measures to reduce demand for transport once adequate supply-side infrastructure – such as electronic tolls, for example – is in place. Other complementary instruments to increase the effectiveness of fiscal measures to reduce car use include adequate parking controls and traffic management systems, as well as the availability of alternatives, such as reliable and frequent public transport.

31 Vehicles, of course, would still have to be registered under the new system. The question of whether it might be more appropriate for a body other than the Revenue Commissioners to undertake this function (as there would not be a tax charge) is a matter that would need to be considered.

32 Sterner, T. *op. cit.*

The introduction of road pricing as part of a strategy to reduce car use was also raised as part of the consultation process. The arguments made were that distance-based road charges, which would vary according to emissions, geographical location and time of day, would encourage the purchase of more fuel-efficient vehicles, as well as reduced car usage. Simple design and early stakeholder buy-in (to reduce resistance) and early preparatory work – including a feasibility study of a national road pricing scheme – are recommended in the main proposal submitted to us on this<sup>33</sup>.

#### Box 9.12: Road pricing and congestion charges

- **Road pricing:** Purpose is to provide incentives to road users to use road capacity more efficiently. Fees (price per kilometre) can be levied according to factors such as time of day, location, distance travelled, real time congestion or vehicle type. Experience in other countries suggests that a long lead-in time, with extensive consultation, is key to the successful implementation of road pricing
- **Congestion charges:** Cordon charges or area licences are used to promote the shift from personal car transport in selected areas. Schemes in London and Stockholm have been successful. The London charge reduced congestion by 30% and traffic levels by 18% when it was introduced. The Stockholm charge reduced weekday traffic by 22% and emissions by 12%. Adequate preparation and the availability of public transport alternatives are generally seen as key issues in relation to the success of congestion charge initiatives

#### Fiscal incentives to reduce emissions – scrappage scheme

It was suggested to us during the consultation process that an environmentally-focused VRT scrappage scheme, under which incentives would be given to motorists who traded-in cars that are over 10 years old against low emissions new cars, would help to reduce CO<sub>2</sub> emissions from cars in use on our roads.

While we suggest that benefits of a car scrappage scheme are greatest in countries with a car manufacturing industry, we conclude that such a scheme may have some merit. Any scrappage scheme should be time-bound and carefully targeted. It should focus on promoting the use of environmentally friendly vehicles. For example, a scheme focussed on encouraging a switch to very low carbon emitting vehicles (such as electric, hybrid electric and flexible fuel vehicles) may be appropriate at some stage in the future.

#### Conclusions on transport

We support targeted fiscal measures aimed at reducing car use. Such measures should only be implemented where alternatives are available. We also support fiscal measures that help the environment by leading to the purchase of newer, cleaner cars. We welcome the rebalancing of motor charges to take account of CO<sub>2</sub> emissions, because it provides a clear incentive to motorists to make environmentally friendlier car purchasing choices.

33 Some detail on road charging as it could be applied in Ireland, based on the Dutch model, is provided in: [http://www.comharsdc.ie/\\_files/Comhar%20STAP%20report.pdf](http://www.comharsdc.ie/_files/Comhar%20STAP%20report.pdf)

**Recommendation 9.8**

The VRT system should be replaced by a system based on car usage, in the longer term. Such a system should be introduced over a 10-year period in order to minimise adverse impacts (in relation, for example, to the existing fleet of tax-paid vehicles).

**Recommendation 9.9**

A focussed scrappage scheme, targeted at encouraging a switch to the purchase of electric and very low carbon emitting vehicles, should be considered.

## Section 5: Revenue neutrality and carbon tax

### 5.1 Introduction

Our terms of reference indicate an intention that environmental measures should be revenue neutral. In particular, we are asked to have regard to the commitment in the Programme for Government

*“to introduce measures to further lower carbon emissions and to phase in on a revenue neutral basis appropriate fiscal measures including a carbon levy over the lifetime of the Government...”*

From an Exchequer point of view, revenue neutrality is generally taken to mean that there is no overall increase or decrease in Exchequer receipts because of the measure. We agree with this approach. We consider that our carbon tax proposal, outlined in Section 3, should not lead to an increase in the overall burden of taxation. In other words, the net Exchequer position should be the same after the carbon tax is introduced as it was before.

A number of the submissions that we received referred to revenue neutrality, predominantly in the context of environmental taxes. Some of the suggestions covered using carbon revenues to ‘fund’ reductions in other taxes. Other submissions covered earmarking revenues for environmentally-related spending. The importance of using carbon tax revenues to combat fuel poverty, so that those on low incomes are compensated for the increase in fuel prices that would result from a carbon tax, featured strongly, and we consider this to be a priority area.

### 5.2 Use of the carbon tax revenue

We recommend that carbon tax revenue should be used, in the first instance, to combat fuel poverty. The overall effects of the carbon tax on vulnerable households should be appraised to ensure that such households (urban and rural) are cushioned from the effects of the tax.

We suggest that measures to address fuel poverty should be biased towards schemes that target energy efficiency. It is important that the incentive created by the carbon tax to reduce emissions is not negated, so measures that preserve the incentive of the tax to change polluting behaviour are generally preferable. We accept that in some cases, however, direct monetary transfers through the social welfare system may be appropriate.

The combating of fuel poverty will improve living conditions for the most vulnerable sectors of society. Reduced greenhouse gas emissions and employment opportunities (through, for example, energy efficiency measures for social housing and low-income private households) are additional benefits.

The recycling of carbon tax revenues to fund energy efficiency incentives for businesses and households featured strongly in the consultation process. We also consider that this would be an appropriate use of carbon tax revenues. Suggestions that were made to us include:

- Funding of loans at favourable rates to business to finance investment in energy-saving products. (Along the lines, for example, of the scheme run by the Carbon Trust in the UK, which offers interest-free loans repayable over four years to enterprises which have been trading for at least 12 months to help them to replace or upgrade their equipment), and
- Grants to householders towards expenditure on insulation and other energy-saving measures

It is important that the competitive effects on energy-intensive businesses of the proposals in this Part of our Report are taken into account; carbon tax revenues might also be used for this purpose. At a more general level, the availability of carbon tax revenues to fund the lowering of direct taxes to improve competitiveness and lessen the labour tax wedge is a valuable policy tool.

We conclude this Section by emphasising that revenue neutrality is not an 'optional extra' in relation to carbon tax and recycling should address fuel poverty in the first instance. Competitiveness issues are also very important; carbon tax revenues should also be used to address this. In all cases, the uses to which the revenue is put should be transparent and open to scrutiny.

## Section 6: The green economy

### 6.1 Introduction

The climate change challenge for Ireland is outlined in Section 3. The environmental agenda poses risks, but also creates business opportunities for Ireland. The green collar jobs and growth agenda, or 'green new deal' has gained considerable momentum in the time we were in session. A number of countries have already developed initiatives that are very large in ambition and scope – notably China, South Korea and the United States<sup>34</sup>. The European Economic Recovery Programme focuses on investment in energy infrastructure, energy efficiency in buildings and research and development (green cars and energy efficiency in buildings).

The Green New Deal economy has two distinct strands:

- Conventional investment that uses proven existing technologies to generate jobs and improve economic, financial environmental and social performance – investment in energy conservation for the relatively deprived is characteristic of this strand
- Innovation that allows better and cheaper ways of generating employment, reducing pressure on the environment, and supporting social objectives. Hybrid cars and cheaper and more effective ways of insulating homes are examples

<sup>34</sup> In China and South Korea, the focus is on conservation (low carbon vehicles, renewable and clean energy and recycling); quality of life (green neighbourhoods and housing); environmental protection (including flood defence); and infrastructure (IT and green transport networks). In the USA, the American Recovery and Reinvestment Act 2009 (ARRA) provides \$94 billion for low carbon power (mainly renewables), \$27.5 billion for energy efficiency in buildings, \$4 billion for low carbon vehicles, around \$10 billion for rail and \$11 billion to upgrade the electricity grid.

Sustainable growth in the future depends on securing niches in the second of these strands. The move towards taxing 'bads' – pollution and environmental degradation – reflects the reality that not pricing the use of scarce environmental endowments is an expression of market failure; it also creates a demand for alternative products and technologies and creates an incentive to improve efficiency and innovation.

## 6.2 Opportunities for Ireland

An indication of what the opportunities for Ireland might be is given in a 2008 report by Forfás and InterTradelreland on Ireland's Environmental Goods and Services (EGS) sector<sup>35</sup>. Key findings from the report are contained in Box 9.13.

### Box 9.13: Some key findings from Forfás/InterTradelreland study, October 2008

- Globally, investment has been increasing dramatically in the EGS\* sector in recent years – it was the fourth largest venture capital investment category in North America in the first quarter of 2008
- Value of the EGS sector in the Republic is conservatively estimated at €2.8 billion, with Northern Ireland accounting for an additional €780 million
- In Ireland, the sector is made up of a small number of major players with a high proportion of SMEs. The drivers seen to be facilitating growth are listed as:
  - Compliance with EU environmental legislation
  - Rising energy costs, climate change considerations, green consumerism
  - Increasing public investment in environmental services/infrastructure
  - Increasing investment in energy and environmentally-related R&D, and
  - Green public procurement
- A targeted approach focussing on five key areas with the greatest growth potential is suggested, in the light of the drivers, international trends and research on the existing enterprise base. The areas are:
  - Renewable energies
  - Efficient energy use/management
  - Waste management, recovery, recycling
  - Water and wastewater treatment, and
  - Environmental consultancy services

*\* The OECD broadly defines the EGS sector as follows: The environmental goods and services industry consists of activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air or soil, as well as problems related to waste, noise and eco systems. This includes cleaner technologies, products and services that reduce environmental risk and minimise pollution and resource use.*

## 6.3 Conclusions for Ireland

We recognise that the environmental goods and services sector has been identified as a growth area of the economy. Fiscal measures – not least the improvements identified in this Report – have a role to play in this. The implementation of our portfolio of recommendations, including – carbon tax, metered water charges, waste charges, road charges, not taking gains from EU ETS

35 "Environmental Goods and Services Sector on the Island of Ireland – Enterprise Opportunities and Policy Implications" InterTradelreland and Forfás, October 2008.

allowances, accelerated capital allowances for energy efficient equipment, favourable VAT rates for environmental goods and the offset of R&D tax credits against employer PRSI costs – are key to Ireland's prospects of success in this emerging world.

Our measures provide a context and set of incentives that, if implemented, will encourage and facilitate improved environmental performance and will also provide a basis for both conventional business using existing technologies, and for knowledge-led enterprise built on innovation.

Our recommendations of most relevance to the green economy agenda are brought together in Table 9.11.

*Table 9.11 relevant to the green economy*

Measure	Comments
<b>Carbon tax</b> <i>Recommendation 9.1 in this Part</i>	<p>This signals that there is an immediate cash flow to be generated by those who can reduce emissions. It is the essential pre-requisite for both strand 1 (conventional investment) and strand 2 (innovation) that we mention in section 6.1. It will enhance the justification for business investment in energy-efficiency and renewable energies.</p>
<b>Metered water charges</b> <i>Recommendations 11.13 to 11.21 in Part 11, Local Government Financing</i>	<p>This provides a number of benefits:</p> <ul style="list-style-type: none"> <li>• It encourages water conservation, which prevents or delays the costs and ecological and other disruptions of major supply schemes such as the transfer of water from the Shannon to Dublin</li> <li>• It reduces the waste of water that has been very expensively captured, stored, treated and transferred to consumers</li> <li>• It creates a business in the development and provision of water saving technologies and techniques</li> <li>• It is equitable – those who consume least do not subsidise those who consume most</li> </ul>
<b>Charges for final disposal of domestic and industrial waste</b> <i>Recommendations 11.22 and 11.23 in Part 11, Local Government Financing</i>	<p>These create the context where reduction in waste, recycling and re-use are all enabled and become more commercial.</p>
<b>Phase out of VRT and replacement by charges</b> <i>Recommendation 9.8 in this Part</i>	<p>The big payoffs to this approach are the reduction in congestion, the associated benefits of hugely improved traffic flow for buses and public transport, and the strong incentive to use very efficient, low environmental impact transport (personal car, walking, cycling, or public transport). The green business opportunities come from the enhanced attractiveness of investment in low impact alternatives, the improved mobility of labour, and the enhancement of quality of life for residents and visitors.</p>

<p><b>Conclusion not to tax the gains resulting from the free allocation of allowances in the EU ETS over the 2010-2012</b></p> <p><i>Recommendation 9.1.7 of the carbon tax – Section 3 of this Part</i></p>	<p>Our analysis of carbon tax included possible taxation of gains from the free allocation of allowances in the EU Emissions Trading Scheme (EU ETS) over 2010-2012. We decided against this course of action. This decision will contribute to funding the transformation of the ESB into a zero emissions company, the renewal of the grid and the time of day metering of electricity. The business opportunities will include rapid expansion of renewables and energy efficiency technologies.</p>
<p><b>Accelerated capital allowances for energy-efficient equipment</b></p> <p><i>Recommendation 9.5 of this Part</i></p>	<p>The ACA scheme in itself is likely to stimulate demand for more energy efficient equipment. As such, it will improve energy and environmental performance, but is unlikely to stimulate new enterprise, because it only applies to existing technologies.</p> <p>Our recommendation on the expansion of the scheme to incentivise innovation would help overcome this limitation.</p>
<p><b>Supporting favourable VAT rates for environmentally friendly goods</b></p> <p><i>Recommendation 9.6 of this Part</i></p>	<p>If enacted by the EU, this will stimulate demand for goods that fit this description, and encourage substitution away from the alternatives. The extent to which this creates business and employment in Ireland depends on the extent to which entrepreneurs can respond and innovate to meet the new opportunities.</p>
<p><b>Option for companies to offset the R&amp;D tax credit 'above the line'</b></p> <p><i>Recommendation 7.20 in Part 7, Supporting Economic Activity</i></p>	<p>Allowing companies to elect to offset the R&amp;D tax credit against their employer PRSI costs will help the innovation-led economy of the future.</p> <p>We note also that the measures we propose to support business generally in Part 7 – such as the removal of tax barriers and help for new enterprise – will also have a role in developing the green economy.</p>