Environmental Tax Reform (ETR) and its contribution to dealing with the Irish Budgetary Crisis

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Summary
Given that we in Ireland have to raise taxes, it makes sense to raise them in ways that simultaneously improve our environmental quality, provide incentives for new low carbon enterprise, ensure that we manage our resources efficiently, help meet our EU obligations, apply the polluter pays principle, and that allow other taxes that damage economic performance to be reduced or at least limit the extent of the rise. And we can do it in ways that are fair and protect those least able to pay. By introducing these taxes and charges over time, total revenues (excluding land value tax) could grow from over €700 million in 2011 to over €2 billion in 2014. The detailed case is made in the main text.

These estimates are based on a Briefing Note prepared by the European Environment Agency, and a series of presentations from experts at a workshop hosted by Comhar Sustainable Development Council in Dublin, October 28 and 29, 2010.

Table 1. Potential New Environmental Taxes applicable in Ireland, 2011-2014, Million €

Water Supply and Waste Water Treatment

Charge Category	2011	2012	2013	2014	Comment
Charges for water supply	250	500	750	1000	Based on recovery of operating and (later) capital costs. capital costs of ~ €250 million for meters not included. Special provisions for those on low incomes
Charges for effluent and water discharge	57	114	171	228	Based on norms in the Netherlands – transferability to Irish situation requires more work
Total	307	614	921	1280	

Aggregates (sand, gravel, crushed rock) and Packaging

Category	2011	2012	2013	2014	Comment
Levy on aggregates	79	79	79	79	Based on 44 million tonnes (one third of volume in 2005), charges at UK rate (€2.4 per tonne), achieving 25per cent recycling. [70 per cent re-cycling required by 2020, and this levy will also choke off leakage across border with N Ireland].
Tax on packaging	20-30	40-50	50-60	60-80	Applying Danish rates for glass bottles and by weight for other waste streams.
Total	99-109	119-129	129-139	139-159	

Re-calibration and extension of CO_2 base to Commercial, and Increasing Excise Duty on Transport Fuels to UK levels

Charge Category	2011	2012	2013	2014	Comment
Re-calibration of VRT and	200	300	300	300	The revenue estimates are highly speculative, as I don't have data as to number of commercial

extension to commercial					vehicles in each size category (stock and flow) or the likely increase in revenue from 2per cent uplift in rates for cars.
Increasing excise duty on petrol and transport diesel to UK levels	54	98	131	153	This would increase duty per 1000 litres by €50 (petrol) and €150 (diesel) to UK levels. The EEA have netted out the expected reduction in revenues from tank tourism from N Ireland. Ideally, all tax would be based on use, rather than simple ownership, but the leakage problem with N Ireland makes such full transfer problematic. A 30per cent increase in annual road tax would have roughly the same revenue effect.
Total	254	398	431	453	

SO_2 and NOx taxes at Swedish and Danish Levels

Charge	2011	2012	2013	2014	Comment
SO_2	29	59	88	118	Applying rates applicable in Denmark
NOx	78	155	233	311	Applying rates applicable in Sweden and Denmark. But note that Swedish tax is especially environmentally effective because it is recycled back to industry, i.e. the revenue does not accrue to the Exchequer.
Total	107	214	321	429	
Grand Total (excluding land value tax)	767	1345-1355	1802-1812	2301-2321	

Land Value taxes, consistent with Danish Levels

	2011	2012	2013	2014	Comment
Land Value Tax	500-750	1,000-1,500	1,500-2,250	2,000-3,000	Applying rates applicable in Denmark

Introduction

When we charge ourselves for our use of environment and public resources, we use them with care. When we allow us ourselves to use them for free, we over-use the environment, and we waste resources. The idea of environmental taxation – which includes charges and levies – is to impose these charges on ourselves, and reduce the pressure we put on the environment.

This approach has widespread application –the poster child in Ireland of this approach is the plastic bag levy, which reduced the use of such bags by over 90 per cent within a week of its introduction. When the revenue collected from such taxes is used to reduce other taxes, this is called 'Environmental Tax Reform', and is revenue neutral; the amount of taxes raised on things that are bad for us and we want to discourage, such as pollution, is compensated by reducing taxes on employment and investment that we want to encourage. Under certain conditions, we get a double dividend – improved environmental quality and a better performing economy.

The European Environment Agency (EEA) has long been an advocate of this approach. As a member of the EEA's Scientific Committee, I chaired the early initiatives by the agency to document what European countries were doing in regard to environmental tax reform and how effective the various initiatives were.

The agency this year decided to focus on an individual member state that is struggling with budget deficits, and go into some detail as to the specific national opportunities as regards environmental tax reform.

We are fortunate that they chose Ireland to pilot this approach. Last week, we had the benefit of several experts in the application of environmental taxes coming to Dublin to present details of their experience, and a team from the agency itself that compiled a briefing note on the opportunities.[1] The outcome was extremely positive, in that a number of opportunities were identified where environmental performance could be significantly improved, while at the same time revenues could be generated.

Below I outline some of the opportunities that were presented that are of direct relevance to our situation here in Ireland, and comment on the potential they present for Ireland.

The Fairness Question

The 'polluter pays' principle' is fair in the sense that it charges most those who use most. It is manifestly unfair that a pensioner living alone who uses water vary sparingly subsidises the rich who use water prodigally. And the same applies to the use of energy, emissions of air pollutants, greenhouse gases etc – without charging, the poor subsidise the rich. And in general, unless environment and resources are priced, the rich will always benefit as they use more 'stuff' and services of all sorts.

It is also the case that the poor have the last capacity to protect themselves from environmental damage; if the availability and quality of our water declines because we can't afford the billion+ Euros a year from general taxation that it now costs, the rich will protect themselves by moving to areas where there is still supply of high quality, they can import water or install treatment systems.

The poor can't afford these options and will bear the consequences. The same logic applies if air quality, waste systems etc deteriorate. In the case of business, we as a society have correctly made a decision to impose a very low rate of corporation tax (12.5 per cent) on company profits, so as to encourage investment and enterprise. The quid pro quo in these difficult times where everyone must pay more taxes and endure a reduction in public services, is that business pay for the impositions it makes on the publicly owned environment. Also, it will support the emergence of a new generation of clean tech businesses whose financial and employment model depends on such charges being imposed.

But it is the case that even though poor people impose much less on the environment than the rich, the poorest will still be stressed financially to pay the charges. In such cases, the following must happen: they should be given the means to reduce their consumption – in the case of water there are very low cost investments (less than €100) that will have an immediate effect – and they should get a lump sum transfer (preferable) or a small free allocation.

Stage Setting

David Gee set the stage by making the case for environmental tax reform, with a focus on five potential dividends – improved environment, more innovation, more employment, more income for the tax system, support for old age by shifting the tax base from shrinking labour force to emissions - yielded when pollution is taxed and revenues are recycled to reduce labour costs. The losers are inefficient users of energy and

[1]The Briefing note and the powerpoint slides used by the contributors are available from Nov. 5, 2010 at: www.comharsdc.ie

resources, big polluters, and waste creators, while winners are workers in labour intensive and eco-efficient businesses and the majority of current and future people on the planet.

Paul Ekins made the case that 'unsustainable' growth will not last beyond this century, and could lead to environmental collapse well before 2100 ("there is no low-cost, high-carbon future")

'Sustainable' growth will be resource-efficient and may in time turn out to be slower growth than in the past, with higher employment (lower productivity and incomes); it depends on innovation – environmental tax reform (ETR) would stimulate such innovation, supported by other policies; relatively high-growth countries in a sustainable future will be those that have developed, and can export, resource-efficient technologies and industries; ETR is a key policy for fostering sustainable growth; there is no evidence that ETR or other policies for environmental sustainability would choke off economic growth altogether; the choice is clear from a cost-benefit angle at any but the highest discount rates; but implementing the choices will not be politically easy.

Comment and Potential in Ireland

A key issue for debate is the tension between the fact that getting the second dividend – the 'bounce' in the economy – requires using the taxes raised from the environment to reduce taxes on labour – but the public favour using some or all of the revenues for environmental purposes, and such may be a pre-requisite for public support.

Possible compromises can be to split the revenues between reducing labour costs and other purposes, expressed as a formal agreement, or informally – as in the case of the Irish carbon tax – the Budget Speech which introduced the carbon tax in December 2009 refers to revenue being used to: boost energy efficiency; support rural transport; alleviate fuel poverty and reduce pressure to adjust payroll taxes. But no specific earmarking - the first three were dealt with in context of Expenditure priorities. Also, where these impinge on those with low incomes, some compensation will be required.

Water and Wastewater

Mikael Skou Andersen made the following points:

- Household consumption per capita in Ireland is over twice what it is in countries with comparable GDP such as Germany, Belgium, Austria, Denmark, the Netherlands, Finland and Sweden.
- EU Water Framework Directive art. 9 stipulates introduction of 'full-cost' water charges, including:
    - The principle of **recovery of the costs** of water services, **including environmental and resource costs** associated with damage or negative impact on the aquatic environment should be taken into account in accordance with, in particular, the **polluter-pays principle**
    - An **economic analysis** of water services based on long-term forecasts of supply and demand for water in the river basin district will be necessary for this purpose
    - Member states shall ensure by 2010 that water-pricing policies provide **adequate incentives** for users to use water resources efficiently.

When Industry emissions to treatment plants are based on measured emissions of chemical oxygen demand (COD), phosphorus, nitrogen, etc., the firms dramatically reduce their emissions, and this in turn reduces by up to 50 per cent the amount of capital needed for waste water treament plants, and their operating costs. When charges for emissions to surface waters are based on measured emissions, these emissions are likewise are sharply reduced.

- Water metering and charging of consumers, measurement of discharge effluent and charging on this basis, and water quality monitoring are key to effective and economically efficient water management

In a presentation by Fabrice Baron on Veolia Water on metering management, the following points were made:

- All meters manufactured now have pulse output to enable a radio unit to log consumption, with built-in radio units as standard. More than 1 million radio modules (AMR) are operating in France.
- It takes about 6 months from design to first deployment – lab tests, field tests, industrial batch produced, more lab tests, first deployment (under close supervision).
- Sensors for water management can provide real time information to mobile phone or other hand held devices on: leak detection, network efficiency, pressure, temperature, water quality, sewage management
- Radio based systems inform customers via monitor or mobile phone of: leak conditions; when going into higher rates; ways to control usage. And they allow monitoring of unoccupied property.
- Average costs per meter (including installation) in the order of €250.

Comment and Potential in Ireland

There is a compelling case to transfer the costs of water supply and waste treatment to the beneficiaries in proportion to the use and pressure they impose. Installing meters and charging per cubic metre would: give householders some control of their use and their bills; encourage installation of water saving devices and innovation in the management of an increasingly scarce resource; generate substantial high quality employment in the installation, monitoring and management of these systems; conserve scarce water, and defer the need for major investments in additional supply; remove the subsidy whereby the rich – who use much more water per capita than the poor - are subsidized by the poor, those households who already pay (group water schemes, farmers) and those who conserve and are parsimonious in their use of water; provide a system for the effective management of extreme events such as extended droughts, which can be managed by charging more per M^3 as more water is used; provide a regular cash flow for investment in infrastructure, so as to ensure that water of the appropriate quality and quantity is delivered on time to where and to whom it is needed.

As regards equity and fairness, as noted earlier, if the availability and quality of our water declines because we can't afford the billion+ Euros a year from general taxation that it now costs, the rich will protect themselves by moving to areas where there is still supply of high quality; they can import water or install treatment systems.

The poor can't afford these options and will bear the consequences. But it is the case that even though poor people impose much less on the environment that the rich, the poorest will still be stressed financially to pay the charges. In such cases, the following must happen: they should be given the means to reduce their water consumption –there are very low cost investments (less than €100) that will have an immediate effect – and they should get a lump sum transfer (preferable) or a small free allocation. And the installation and management of metering system will generate high quality employment, and the unemployed should be given training and other support to help them avail of these opportunities.

Charging users of waste water treatment plants based on the load they impose on the system gives a strong incentive to use this capacity parsimoniously, and reduces both the capital requirement (size of the plant) and the operating costs.

Table 2. Annual Revenue Estimates (€Million) 2011-2014, Water Supply and Waste Water Treatment, Ireland

Charge Category	2011	2012	2013	2014	Comment
Charges for water supply	250	500	750	1000	Based on recovery of operating and (later) capital costs. Initial capital costs for meters etc of ~ €250 million not included
Charges for effluent and water discharge	57	114	171	228	Based on norms in the Netherlands – transferability to Irish situation requires more work

Solid Waste

Pay by Weight and Plastic Bag Levy in Ireland

In a 'before' (flat fee) and 'after' (weight based) analysis of deliveries of solid waste to final disposal by households in Clonakilty, Ireland, Watson and Scott found a 45 per cent reduction in household waste, achieved by a combination of recycling, composting, reducing, but with some evidence of burning. Ninety three per cent agreed that it encouraged households to reduce waste, and 56 per cent agreed that it was fairer than flat charges.

Culbert documents the success of the Irish plastic bag levy introduced in 2001, showing that the initial levy of €0.15 per bag at the point of sale reduced use by over 90 per cent, was and is very popular with consumers, with revenues ring fenced in an Environment Fund used to finance waste reduction, environmental research etc.

Landfill and Aggregates

Fisher and Hansen document in member states the extent of coverage and amount of levies on deliveries of different types of waste to land fill (many) and incineration (few) , and for aggregates (sand, gravel and crushed rock). In 2005 Ireland had the largest production of aggregates per capita (31.7 tonnes) in the EU, followed by Finland (20.2); Ireland's production dropped in 2008 to about 12 tonnes per capita. Sixteen EU member states impose an aggregates tax. The UK has the highest tax per tonne (€2.87) which amounts to about 20 per cent of total value. The application of this rate to 2008 aggregates production would generate revenues of € 382 million. The recycling rate in the UK is 25 per cent, compared with the rate in Italy (1per cent) where the tax per tonne is €0.2-0.3 per tonne. In 2005, Ireland aggregates production was 134 million tonnes, with 1 million recycled.

Taxes on aggregates may contribute to meeting environmental targets, e.g. the EU target of 70 per cent recycling of C&D waste (excl. soil) by 2020, in an effective manner.

Packaging

Denmark is one of the few countries to apply taxes on packaging materials with a view to reducing the volume of packaging coming into the consumption system. The tax was estimated based on a life cycle analysis of each product. It is applied per bottle, e.g. wine and beer bottles in range €0.21 to 0.013 per bottle), and on the basis of weight (per kilo), e.g. glass (€0.25), paper and cardboard - primary material (€0.13), paper and cardboard - secondary material (€0.073), Plastic - not PVC – primary material (€1.73), Plastics not PVC – secondary material (€0.103)

Applying Danish rates to the same range of products, the revenue for Ireland would be 60-80 million €/year (weight + volume tax).

Comment and Potential in Ireland

I have recently been invited to sign up for a new waste collection system in County Cork. The options given are to choose to pay by weight, or pay a fixed annual fee. All those who expect to have very large waste loads will choose the fixed fee, and will have no incentive thereafter to change their behaviour.

The sharp (45 per cent) fall in deliveries to final disposal by households in Clonakilty once they were faced with pay by weight *makes a compelling case for requiring that pay by weight be universally applied.*

Table 3. Annual Revenue Estimates (€Million) 2011-2014, Aggregates (sand, gravel, crushed rock) and Packaging, Ireland

Charge Category	2011	2012	2013	2014	Comment
Levy on aggregates	79	79	79	79	Based on 44 million tonnes (one third of volume in 2005), charges at UK rate (€2.4 per tonne), achieving 25 per cent recycling. [70per cent re-cycling required by 2020, and this levy will also choke off leakage across border with N Ireland].
Tax on packaging	20-30	40-50	50-60	60-80	Applying Danish rates for bottles and by weight.

Carbon Taxes Sweden and Ireland

Sweden

Akerfeldt and Hansson addressed the application and implications of CO_2 tax in Sweden, which are combined with energy taxes. They show that, over the 1990 – 2007 period, the economy grew in real terms by 48 per cent, while CO_2 emissions fell by 9 per cent. The rates of energy and CO_2 taxes applied are high, being particularly so for households and services, where the combined rate on heating gas oil per 1000 litres has risen from €99 in 1993 to 373 in 2010; the equivalents. For industry and agriculture, the rates are much lower - €23 in 1993 and €62-44 in 2010. The most striking impact has been the growth in the share of biomass (mainly wood and household waste) in district heating, increasing from 24 per cent in 1990 to 70 per cent in 2007.

Ireland

Burke recounted the Irish experience with the CO_2 tax, which came into effect in December 2009 and applied immediately to all CO_2 emissions from petrol and auto diesel. From May 1st, 2010, it was extended to kerosene (used for various purposes, including central heating), marked gas oil (also known as 'green diesel' or 'agricultural diesel'), liquid petroleum gas (LPG), fuel oil and natural gas. Fuel used in electricity generation exempt, as per EU Energy Tax Directive, as were other facilities in the EU ETS relieved subject to application of EU minimum rates; bio fuel deemed to be exempt; firms in Energy Agreements with State Agencies are not exempt.

Overall, direct impact on households was estimated at an average of €2/€3 per week, with an impact around 0.35 per cent in a full year, a yield of €330 million divided between transport fuels (50 per cent) other oils (30 per cent) and gas, coal, peat (20 per cent). There have been delays in extending the tax to coal/peat, because there is no control and movement regime applying (unlike petrol/diesel), and potential movement from Northern Ireland is an issue, still being addressed. There are judged to be credibility issues if low-grade coal enters Irish market without carbon tax. The expected impact on prices (per cent change in brackets) are: petrol (3.5), diesel (4.4), kerosene (7.2), marked gas oil (7.5), LPG (4.1), Fuel Oil (7.9), natural gas (7.0), peat briquettes (10.1), coal (11.8).

Lyons and Conefrey examine various options assessed using an Irish version of the HERMES model, and conclude that: a carbon tax equal to EU ETS price guarantees efficient emissions reduction; double dividend

possible if carbon tax revenue recycled through lower income tax; no double dividend if revenue used to repay debt; biggest impact of carbon tax will be to incentivise R&D and new technologies; in the context of a hierarchy of fiscal policy options, a carbon tax is less damaging than other instruments.

As regards distributional impacts, they conclude that: the carbon tax is regressive, but somewhat less regressive after indirect CO_2 emissions taken into account; most of this effect is amenable to compensation by increasing social welfare and tax credits; up to 55,000 households could require separate compensation, e.g. via student grants, capital programmes to improve household energy efficiency; the incidence is concentrated in the commuter belts.

Hughes-Elders address the introduction and impact of carbon-based vehicle registration tax (VRT) in Ireland. VRT is chargeable on the first registration of motor vehicles (including motor-cycles) in the State. It applies to both new and imported second hand cars. The system applies mainly to passenger motor cars and the schedule applied is as follows:

Table 4. Rates of VRT and Motor Tax, Percentage Sales in different CO2 emission Bands, and share of sales in each band, 2008 and 2010.

Band	Emissions in grams per km	Rate (%) applied to Open Market Sales Price (OMSP)	Annual Motor Tax	% of total sales 2008 Jan-June	% of total sales 2010 to Sept.
A	0 to120	14	104	2.4	34.7
B	>120 to 140	16	156	22.8	45.5
C	>140 to 155	20	302	18.3	10.4
D	>155 to 170	24	447	28.1	6.4
E	>170 to 190	28	630	17.9	2.1
F	>190 to 225	32	1,050	7.3	0.6
G	> 225	36	2,100	3.2	0.3

The transformation in the carbon intensity of the new car fleet is notable, with the share of the lowest bands (A&B) increasing from 25.2 to 80.2 per cent, and the highest (F&G) falling from 10.5 to 0.9 per cent, and the average emissions per new car falling from 164 mg per kilometre in 2007 to 133 g per km in 2010. The share of diesels rose from 28.0 per cent in 2007 to 63.91 per cent in 2010. The yield from VRT fell from €1.11 billion in 2008 to €375 million in 2010 (€349 million to Sept 2010) The main factor in the revenue decline was the sharp fall in new car sales due to the changed economic circumstances. The reduction in new car prices, and a reduction in the effective average VRT rate applying under the new VRT system also contributing.

Comment and Potential in Ireland

The view is sometimes expressed that the Irish carbon tax will have little impact on emissions. However, this view is usually based on the fact that the impact on petrol and diesel prices are +3 to 4 per cent, and so are judged not to be salient to consumers. However, they do re-enforce for motorists the view that fuel prices over time are inexorably going to increase, and that this will have influence on behaviour in regard to vehicle choice and driving propensity. Moreover, the price effect for farmers and others using marked fuel is +7.5 per cent (the percentage is higher than applies to transport diesel because there is already a large excise

duty on the latter which increases the base on which the percentage is estimated) which does get noticed and will influence behaviour; the increase is comparable for those buying oil and natural gas.

The EEA team suggested that the Irish excise duty on transport fuel could be increased to UK levels, with a net increase to the exchequer of about €150 million. The Swedish rates seem to be much higher – it is difficult to compare, because they are expressed per 1000 litres rather than per tonne of CO_2.

The Vehicle Registration Tax only applies to cars. Revenues fell by over 66 per cent from 2008 to 2009, in sharp contrast to the annual road tax which applies to all cars, where revenues only fell from €1.060 billion in 2008 to 1.058 in 2009, a fall of only 0.18 per cent, another illustration of how much more stable taxes are that apply to a stock rather than a flow. The fall in Vehicle Registration Tax (VRT) was a product mainly of the reduction in the volume and price of new cars, but was also influenced by the rates applied. The rates for light commercials at 13.3 per cent and large commercials at a standard €50 have not changed in these years. Re-calibrating by adding 2 per cent to each of the rates that apply to cars, and basing the tax for the commercial categories on CO_2 rating should be considered, which inter alia would remove the incentive to scale up to large commercial.

Table 5. Annual Revenue Estimates (€Million) 2011-2014, Re-calibration and extension of CO_2 base to Commercial, and Increasing Excise Duty to UK levels, Ireland

Charge Category	2011	2012	2013	2014	Comment
Re-calibration of VRT and extension to commercial	200	300	300	300	The revenue estimates are highly speculative, as I don't have data as to number of commercial vehicles in each size category (stock and flow) or the likely increase in revenue from 2 per cent uplift in rates.
Increasing excise duty on petrol and transport diesel to UK levels	54.3	97.9	130.9	153.3	This would increase duty per 1000 litres by €50 (petrol) and €150 (diesel) to UK levels. The EEA have netted out the expected reduction in revenues from tank tourism from N Ireland. Ideally, all tax would be based on use, rather than simple ownership, but the leakage problem with N Ireland makes such full transfer problematic. A 30 per cent increase in annual road tax would have roughly the same revenue effect.

Road Pricing

Stockholm, about the size of Dublin, has been decarbonising, reducing emissions per capita from 5.3 tonnes of CO_2 in 1990 to 4.0 in 2005, with the objective of achieving 3.0 tonnes in 2015 and zero by 2050.

Road pricing operated on a pilot basis from 3rd January to 31st July 2006. This was followed by a referendum on the 17th September, which approved the continuation of the scheme. The road pricing proposal was extremely unpopular initially - there were a number of legal challenges, and intense opposition, including from the Stockholm Chamber of Commerce - but once in place, it became very popular. Those in favour accounted for 25 per cent in December 2005 but this rose to 65 per cent in December 2007

There are 18 control points where a charge is made when entering. It cost €350 million to install, including €100 million for extra buses. A rate of €2 applies 07:30 – 08:30 and 16:00-17:30. It generates about €100 million annually, of which €20 million are used to fund the operation of the scheme. The net income of €80

million accrues to the city, which uses it mainly for transport related investment. The outcome has been a 20 per cent decrease in traffic, an associated de-congestion and shortening of journey times at peak by 15-20 minutes, a 10 – 14 per cent decrease of emissions, a 2 – 10 per cent improvement in air quality.

Exemptions apply to emergency vehicles, vehicles with a disability-permit, foreign vehicles, transport services for the disabled, taxis, motorcycles, buses over 14 tons, vehicles using alternative fuel until 1 Aug 2012. Gothenburg is introducing road pricing, which will be operational in 2013.

Comment and Potential in Ireland

The Stockholm experience is of great relevance to Dublin, where the opposition to road pricing is of the same nature and magnitude, and where experience of the benefits would probably achieve a similar turn around in attitudes. The fact that the travel times of buses are sharply increased with road pricing defuses the argument that we should take no action until we have a state of the art public transport system. It is precisely road pricing that turns road based bus transport into state of the art public transport. Because the revenues in a road pricing system should accrue to the city that implements it, this aspect is not further addressed.

Removal of Subsidies

Jean Philippe Barde identified the extent at OECD level of environmentally-damaging subsidies in agriculture ($376 billion in 2008 - except Australia and New-Zealand) with the shift to direct payments in the EU reducing but not eliminating the environmentally negative effects, considerable improvement in the EU fisheries, consumption subsidies in energy ($557 billion, of which oil (312), gas (204) and coal (40), and energy production subsidies of $100 billion, transport, manufacturing, and natural resources (water, forests…). These are also generally economically damaging, as the expenditure on subsidies could be used to better effect in other uses. Phasing out of energy subsidies would reduce primary energy demand by 5.8per cent and CO2 emissions by 6.9per cent. But he points out that there. There was no specific attention focussed on subsidies in Ireland across these categories.

Comments and Potential in Ireland

There are a number of subsidies in Ireland relating to agriculture, energy, transport, fisheries etc which will impact on environmental performance. This portfolio was not assessed as part of this exercise.

Other Opportunities

The EEA team in their briefing note identified a number of other opportunities for the application of environmental taxation. The most significant of these include the application of an energy tax to non-EU ETS small users, at the rate at which it is applied in the Netherlands and Finland (€1.3/GJ), a carbon tax applied off shore, a tax on sulphur (SO_2) – rate of €5.37/kg - and nitrogen (NOx) - €5.37/kg - emissions, a tax on water supply and nitrogen fertiliser tax.

Comment and Potential in Ireland

In terms of environmental impact, the most salient of these is likely to be the contribution to meeting obligations under the Emissions Ceiling Directive (which caps a list of emissions to air by law), where we face challenges meeting obligations as regards NOx; the Swedish experience shows that a NOx tax – especially when the revenue is recycled back to industry based on the efficiency with which they use energy – is very environmentally effective. A tax on energy applied to non EU ETS firms that did not apply to firms in EU ETS could be very inefficient, because there is competition between electricity and other sources of energy for the heat market, and an asymmetry in taxation would favour the former. There is very little economic activity offshore to which to apply a carbon tax. However, when extraction from the natural gas field in Corrib gets going, this potential should be re-visited.

Table 6. Annual Revenue Estimates (€Million) 2011-2014, SO2 and NOx taxes at Swedish and Danish Levels, Ireland

Charge Category	2011	2012	2013	2014	Comment
SO_2	29	59	88	118	Applying rates applicable in Denmark
NOx	78	155	233	311	Applying rates applicable in Sweden and Denmark. But note above comment that Swedish tax is especially environmentally effective because it is recycled back to industry, i.e. the revenue does not accrue to the Exchequer.

Land Value Tax

Presentations by Gurdgiev, Harrison and Reed made the case for land value tax, sometimes called site value tax. The tax is based on the value of land in its most valued use, independent of what is built on the land, or what its current use is. The approach has the following positive economic efficiency features: it provides a dependable source of revenue, thereby avoiding the perturbations in income which are a feature of transaction taxes such as stamp duty; it encourages and facilitates entrepreneurs and land owners to make the most profitable use of the land; because values will be low in deprived neighbourhoods, it encourages investors to take advantage of the differential to channel economic activity towards such areas; where new infrastructure is to be provided, the increase in land value can be used to contribute to the financing thereof. Where government wishes to encourage public goods such as open space, recreation areas etc., the site value can be lowered, or zoning can be used to require such features.

Harrison makes the point that jurisdictions that adopted the land value approach such as Hong Kong (a product of the leasing arrangements between the Chinese and British authorities after the Opium Wars) has allowed this jurisdiction to finance a state of the art infrastructure and public transport system without recourse to economically damaging taxes. The fruits of the land value approach in Harrisburg Pennsylvania were documented by Reid, the city's former mayor, who pointed out that it will only be accepted by the public if they see that other taxes will be reduced, and that it delivers in terms of income and economic activity.

Comments and Potential in Ireland

When the Commission on Taxation (of which I was a member) reported in 2009, it did not recommend a land value or site value tax, but it did consider that there was 'a strong economic rationale for land value taxation.' Instead it recommended a tax on property, but with a recurrent tax on zoned development land which is 'consistent with many of the principles of a land or site value tax'. It identified the challenge of deriving an acceptable and credible value for land which has property already on it as one challenge, and another is the difficulty in explaining to property owners why one parcel with no property can be valued the same as or more highly than another which does. Assuming that these challenges can be met, the estimates of income from the land value tax – which would of course take the place of a property tax, would be as follows:

Table 7. Annual Revenue Estimates (€Million) 2011-2014, Land Value taxes, consistent with Danish Levels, Ireland

	2011	2012	2013	2014	Comment
Land Value Tax	500-750	1,000-1,500	1,500-2,250	2,000-3,000	Applying rates applicable in Denmark

Presentations Available
All the slides presented at Environmental Tax Reform Workshop, Comhar Sustainable Development Council, Dublin, October 28 and 29, 2010, available from Nov. 5th on: www. comharsdc.ie. [Other presentations for which no text is available were from Ministers Noel Dempsey (Transport) and John Gormley (Environment Heritage and Local Government), Connie Hedegaard (European Commissioner for Climate Action) and Stephen Reed (former mayor of Harrisburg).

Overall Analysis

- Speck, Stefan, David Gee, Mikael Andersen, Jock Martin, 'Further Environmental Tax Reform (ETR) – its illustrative potential in Ireland based on established practises across Europe.'

Note: This is the key report that draws on member state experience to suggest a wide range of potential applications for Ireland.

- Ekins, Paul, 'Environmental Tax Reform and the Financial Crisis'

- Rosenstock, Manfred, 'Environmental taxation at Member State level – a European Commission perspective'

- Speck, Stefan, and David Gee, 'What ETR can contribute to environment and finances'

Water and Wastewater

- Andersen, Mikael Skou, 'Implementing Wastewater Levies in EU Member States'
- Baron, Fabrice, 'Implementing Water Charges – metering programmes and water efficiency'

Aggregates and Packaging

- Fischer, Christian, and Mikkel Hansen, 'Implementing Charges for Waste Management in Europe'
- Watson, Dorothy, and Bill Culbert, 'Implementing the Landfill and Plastic Bag Levies'

Carbon and Climate Change

- Akerfeldt, Susan, Mats-Olof Hansson, 'Carbon Taxation in Sweden – the road 1991-2010 and onwards
- Burke. John, 'Implementing the Irish Carbon Tax'
- Hughes-Elders, 'Implementing the Irish Carbon based Vehicle Registration Tax'
- Lyons, Sean and Thomas Conefrey, 'Macroeconomic and distributional effects of a carbon tax'

Land Value Taxation

- Gurdgiev, Constantin, 'Potential for land value taxation to transform Irish Economic Performance'
- Harrison, Fred, 'Land Value Taxation – lessons from Europe'

Environmentally Harmful Subsidies

- Barde, Jean Philippe, 'Environmentally Harmful Subsidies'

Road Pricing

- Söderholm, Gunnar, 'Transport and Road Pricing – Stockholm as a case study'

Biodiversity

- Naumann, Sandra, 'Preserving Biodiversity with Market Incentives'