

Comhar SDC Budget 2009 submission

Executive summary

A carbon levy should be introduced immediately in the non-ETS sectors to provide the right signals to emissions reduction activities.

Initially the carbon levy should be set **at the same price as the ETS market price** to encourage least cost reductions although emissions targets for the non-ETS sectors will be more difficult and expensive to meet than in the ETS sector. This would imply a levy of approximately €20 per tCO₂, which would translate to roughly 5c per litre of petrol. It should be clearly marked on receipts to raise awareness of the carbon implications of purchases

The **use of the carbon tax revenue** is very important. A carbon tax should be introduced with appropriate structures in place to ring-fence revenues for specific activities. The carbon levy is predicted to be beneficial to the economy and cause growth if the revenue is used for a combination of: compensation to vulnerable groups, labour tax reductions, and energy efficiency savings in proportion to the sectoral contributions. Further targeted sectoral policies will be needed to reduce GHG emissions; Comhar SDC prioritises the following:

- **Agriculture** will not be affected by a carbon tax and investment is needed in education and incentives for best practice in cattle and slurry management. The rate of sustainable afforestation should be increased significantly to provide carbon sequestration and biomass options.
- Policy measures for sustainable **transport** should focus on a rural transport strategy, least cost options such as eco-driving and work towards a national road pricing system.
- Refund a portion of carbon tax to the **services** sector under condition that companies join energy-saving agreements. Implement green procurement requirement beginning with public sector.
- In the **residential** sector carbon tax funds could be used to eliminate fuel poverty, provide grants to increase alternative fuel use in homes; give tax credits to spending on energy efficiency measures such as home insulation, continue grants for renewable heating and electricity systems.

Introduction

The Programme for Government states that Ireland will reduce greenhouse gas emissions by on average three percent annually over the lifetime of the Government. Even if this is interpreted as reducing a cumulated annual three percent by 2012, this still means a reduction in emissions to a level equivalent to 86 percent of 2007 emissions, which is substantial.

In addition, Ireland faces a greenhouse gas emissions reduction target in the non-Emissions Trading Scheme sectors (non-ETS) of at least 20 percent (compared with 2005) by 2020. The sectors mainly affected are transport, agriculture, residential heating, and services. Policy measures are urgently needed to reduce emissions from these sectors drastically. Transport and agriculture will prove particularly intractable. A cut of 20 percent is huge and requires radical changes over the period rather than incremental policy measures.

Proposals

Several levels of policy measures are needed to reduce Irish greenhouse gas emissions. Across all non-ETS sectors a carbon price should be introduced immediately to encourage the most efficient emissions cuts. A carbon price signal is the most efficient way to reduce carbon emissions in the Irish economy. In our Budget 2008 submission Comhar SDC made the case for the immediate introduction carbon levy. This position has not changed. The revenue from a carbon levy can be used to generate economic growth, help vulnerable groups and be invested in new energy-saving technologies and activities. In addition to a carbon levy, targeted policy measures are needed to encourage emissions reductions in the non-ETS sectors, especially the most intractable – transport and agriculture. Some these will require funds, which can be paid from the carbon levy revenue.

Emissions from the non-ETS sectors are more difficult, and therefore more expensive, to reduce than those from the ETS sectors. The dilemma is whether there should be a different carbon price in the non-ETS sectors, reflecting the higher abatement costs there and the different emissions reduction target, or whether the ETS price should be used for non-ETS sectors. Although it is cost-effective to have the same carbon price across all sectors, if this price is set by the ETS market, it will not be high enough to reduce non-ETS emissions sufficiently to meet the non-ETS targets. Comhar SDC proposes a compromise to initially introduce a carbon tax on no-ETS sectors at the ETS level but to use some of the revenue to implement further emissions-saving measures that will increase the emissions saved and increase the effectiveness of the carbon levy. Later, based on these experiences, the carbon tax could be reviewed and further options should be explored that may facilitate a higher carbon price in the economy such as a cap and share scheme.

Carbon levy

The economic situation in 2009 is predicted to be constrained. This should not be a barrier to the introduction of a carbon tax. Based on modelling results from research described below, Comhar SDC is of the view that introducing a carbon tax will trigger growth in GNP and employment, investment in energy efficient technologies and reduce greenhouse gas emissions.

Even if carbon prices are introduced at a low rate, it sends an important message to all that carbon emissions are to be taken seriously and gives confidence to long-term investment in low carbon technologies.

The questions arising are:

- What level should the price be set at?
- How much emissions can be reduced by a carbon tax?
- What use should the revenue be put to?
- How should vulnerable groups be protected?

Some modelling has been carried out and the results can help us answer these questions. Comhar SDC has commissioned research looking at fiscal measures such as a carbon tax and a cap and share scheme¹. Consultants AEA Technologies and Cambridge Econometrics carried out this research. In parallel ESRI have used the HERMES and ISus models to assess the impact of a carbon tax on the Irish economy².

The really good news is that all the modelling results for both a carbon tax and cap and share scheme show that neither is detrimental to the economy at any of the price levels examined. The use of the revenue is particularly important in ensuring that the scheme operates as efficiently as possible and that vulnerable groups are compensated for the price rises.

Comhar SDC suggests that initially a carbon tax should be introduced that creates a consistent carbon price across all economic sectors. Since the sectors covered by the ETS already face a carbon market price across the EU, the least complex design of a carbon price for non-ETS sectors could involve aligning carbon costs in these sectors with the ETS market price. A single price throughout the economy will ensure that emissions reductions are undertaken at least cost. Therefore a carbon tax would be set at the level of the ETS price. This could be relatively simply estimated based on historical values for a given period or on the futures markets and set annually. The EU Commission estimates the price of a tonne of CO₂ emissions to range from €20 in 2010 to €38.

The latest ESRI modelling results predict a reduction in emissions of 1.7% if a carbon tax of €20/tCO₂ were applied and the revenue used to pay national debt. This reduces to 1.5% if the revenues were used to reduce income taxes and remains at 1.7% if a lump sum is paid to householders³. The E3ME model by Cambridge Econometrics predicts an emissions reduction of 1.0% if a carbon tax at the ETS price were set in Ireland and the revenue used to reduce income taxes and increase social welfare benefits. Both models predict GNP growth in the region of 1-2% as a result of the carbon tax revenue recycled to increase disposable income for workers and non-workers. The E3ME model shows that even with much higher carbon prices in the region €200-300 per tCO₂ that if the revenue is used to reduce income tax and increase social welfare that GDP still increases 0.5-0.9%.

¹ Pollitt, H., U. Chewprecha, and J. Tarafdar (2008) *Cap and Share – Policy Options for reducing greenhouse gas emissions for Ireland and possible macroeconomic effects*, Report for Comhar SDC, Dublin 2 (forthcoming).

² Tol, R.S.J., T. Callan, T. Conefrey, Fitz Gerald, J., S. Lyons, L. Malaguzzi Valeri, and S. Scott (2008). “A Carbon Tax for Ireland”, *ESRI Working Paper No. 246*, Economic and Social Research Institute, Dublin 2.

³ Conefrey, T., J. Fitz Gerald, L. Malaguzzi Valeri, and R.S.J. Tol (2008), “The Impact of a Carbon Tax on Economic Growth and Carbon Dioxide Emissions in Ireland”, *Working Paper No. 251*, Economic and Social Research Institute, Dublin 2.

The research by Cambridge Econometrics included modelling the level of carbon tax needed to achieve a reduction of 20% and 30% energy-related CO₂ emissions from non-ETS sectors by 2020 compared with 2005. The results indicate that the prices required would be €182 and €329 per tCO₂ in 2020⁴. A reduction of 10% is estimated to require a price in the region of €80/tCO₂. However, a carbon price set this high would mean that the non-ETS sectors would face much higher carbon prices than those in the ETS.

Several points are clear from these results. A carbon tax set at the ETS price level with astute use of the revenue will not harm the Irish economy. Secondly, a carbon tax at the ETS rate will not reduce CO₂ emissions in the non-ETS sectors significantly, at least not near the amount needed to fulfil Irish greenhouse gas emissions commitments. A higher carbon price will be needed if it is the sole mechanism to reduce non-ETS emissions and in this case other forms of pricing such as personal trading may be more politically acceptable. And thirdly the use to which carbon tax revenue is put has a significant impact on the (a) macroeconomic effects, (b) level of emissions reductions, and (c) public and political acceptance. This latter point is becoming increasingly important with rising energy prices.

Revenue use

The ESRI Medium Term Review estimates the CO₂ emissions from the non-ETS sectors in 2010 to be approximately 28MtCO₂, which would generate revenue from a carbon tax at €20/tCO₂ of €550 million⁵.

A first option is give back some or all of the revenues from the carbon tax to the different sectors in approximate proportion to their payments, and in manners that further intensifies and incentivises actions to reduce emissions and to address some of the equity and competitiveness concerns associated with a carbon tax. Many economists do not favour hypothecation of revenues from environmental taxes for greenhouse gas emissions saving activities. The argument is mainly that it reduces the flexibility of the government budget and also that if an activity is not worth subsidising from the national budget then it is also not worth subsidising with the carbon tax revenue (Tol et al. 2008). There is the risk that if significant funds are earmarked for investment in specific activities then they may be wastefully spent in order to “use up” the funds.

However there are also some advantages associated with a decision that some of the carbon tax revenue should be invested in further greenhouse gas emissions savings activities:

- The experience of SEI through the pilot negotiated agreements programme with industry in 2002 showed that the emissions savings were almost doubled if a carbon tax was linked with an industry agreement providing energy-saving expertise and services.
- There may currently be underinvestment of the government budget in public good activities such as energy technology R&D, centres providing expertise and advice to firms in energy efficiency and other greenhouse gas emissions

⁴ Translating to a petrol price increase of approximately €0.5 and €0.8 per litre respectively.

⁵ Fitz Gerald, J., A. Bergin, T. Conefrey, S. Diffney, D. Duffy, I. Kearney, S. Lyons, L. Malaguzzi Valeri, K. Mayor, and R.S.J. Tol 2008. *Medium-Term Review 2008-2015*, Economic and Social Research Institute, Dublin 2.

mitigation and adaptation activities, which are of little commercial value at this time.

- Investment in developing alternative energy sources such as renewable energies may reduce the burden of the carbon levy in the long run and create a new industry with employment.
- Investment of the revenue in the sectors that have paid the taxes increases the popularity and hence political feasibility of implementing a carbon tax substantially.
- There is a fairness aspect; if all the revenue is spent on individuals' income tax reductions and welfare benefits, then it might be argued that business sectors facing the carbon tax such as road haulage, services sectors etc also deserve a share of the revenue directly.⁶
- Investment in further energy-saving activities should increase the effectiveness of the carbon tax.

Therefore we believe there is a strong case to recycle some of the revenue to individual sectors to increase stakeholder buy-in to a carbon tax scheme and also to maximise the greenhouse gas emissions savings that could be achieved through investment in public good activities such as provision of centres of expertise etc. In order to identify the best means to utilise the revenue in each sector, the government should engage with each sector to identify expenditure within the sector that will further reduce emissions. This is consistent with the partnership model that has worked well for Ireland, and should encourage 'buy in' as well as increasing the effect on emissions reduction yielded by the incentive effects of the levy alone. The key requirement of any sectoral agreement would be that it significantly further reduce emissions at least cost.

An important advantage of any such scheme could be the growth of new, environmental industries based around energy-saving technology that would benefit Ireland's economic growth and job creation in the long run. Below we identify some key measures that are needed in non-ETS sectors to reduce their emissions, some of which could be funded through carbon tax revenue. Further study is needed to examine the gaps in current spending and assess the amounts needed to develop opportunities and technologies to reduce greenhouse gas emissions. Investment in environmental research is crucial in this regard. Regular review would be needed of the amounts spent to ensure efficiency.

Another portion of the funds should be used to compensate individuals for rising carbon prices, either by reducing labour taxes or to provide a lump sum rebate to households. Since carbon tax raises prices and therefore the cost of living too, it would normally be expected that wage demands would also rise. Therefore the revenue from carbon tax could be used to offset some of the increased costs people face by, for example, reducing income taxes, social insurance contributions, increasing social welfare, or giving a lump sum to all households. This could be done in line with the Agreed Programme for Government, which has the stated goal of reducing PRSI at 2% to 4% over the term of government. However, the programme also plans to raise the ceiling on PRSI rates so that PRSI can be levied on all income in which case the additional revenue raised would cover the reduction in rates. Wages on the other hand have risen in Ireland significantly over the last years with 5.5% growth in 2007 and exceed that of many of our trading partners. While the latest ESRI Quarterly Economic Commentary forecasts this to decrease over 2008 and 2009 to 4% and 3.5%

⁶ Although they would benefit indirectly through stable wage demands as a result of the income tax reduction.

respectively (Barrett et al. 2008)⁷, the use of carbon tax revenue to reduce labour costs further could be significant in improving Ireland's competitiveness. A carbon tax refund may be a more efficient way to compensate lower income groups than income tax reductions or social welfare contributions. The ESRI modelling research finds that recycling revenue in the form of lower labour taxes is better for GNP than giving a lump sum to all households.

Scott and Eakins (2004)⁸ and Tol et al. (2008) examine the impact of a carbon tax on household income and find that it is regressive as expected⁹; the lower income deciles of the population spend a higher share of their incomes on fuels. Scott and Eakins (2004) considered various forms of compensation¹⁰ to lower income households and found that a strategy which delivers lump sum compensation to the bottom five income deciles of the order of the average annual expenditure on carbon tax (estimated at €246) would be best. They also recommend setting aside approximately €50 million for energy efficiency enhancing schemes such as house insulation and fuel switching. There were an estimated 100,000 households or 6.5% of the population in 2005, who went "without heating at some stage during the year" because they could not afford it¹¹. It costs on average €1,000 to install attic or wall cavity insulation in a home (which improves energy efficiency by 20%); therefore a significant budget is required to perform this task in all homes classified as at risk of fuel poverty.

Box 1: Rural Ireland

In the analysis of most market-based policy instruments such as carbon taxes to reduce CO₂ emissions, it becomes quickly clear that, regardless of policy measure, there are substantial challenges facing the reduction greenhouse gas emissions in rural Ireland. This is because of the current situation where houses in rural areas are more likely to be larger, not linked to natural gas mains, isolated from public transport services, and therefore dependant on the private car. The result is that any fiscal measures to reduce emissions will generally increase the cost of living in rural areas. Structural issues such as previous bad planning and infrastructure must be addressed as a matter of urgency to improve the sustainability of rural areas. This should be carried out as a separate but related challenge so that rural Ireland does not continue to be perceived as a barrier to climate change policy.

The modelling work by Fitz Gerald et al. (2008) and Tol et al. (2008) estimates that the increased cost of living due to the carbon tax could be fully compensated by reducing labour taxes and increased welfare benefits with 65-80% of the revenue, leaving 20-35% of the revenue available for other uses. From this it seems that there is scope to make room for use of the revenue for both macroeconomic and greenhouse gas emissions mitigation benefits.

Recommendation: In line with the literature discussed here, we propose that 40% of carbon revenues be utilised to reduce income taxes, 25-30% be used to compensate lower income households, and the remaining amount be invested in public good activities to reduce greenhouse gas emissions in the affected sectors. The Annex lists

⁷ Barrett, A., I. Kearney, and M. O'Brien 2008. *Quarterly Economic Commentary, Spring 2008*. Economic and Social Research Institute, Dublin 2.

⁸ Scott, S. and J. Eakins 2004. 'Carbon Taxes: Which Households Gain or Lose?' *EPA Final Report 2001-EEP/DS7-M1*, Environmental RTDI Programme 2000-2006.

⁹ Interestingly, Scott and Eakins find that while a carbon tax would be regressive for expenditure on residential fuels, expenditure on transport fuels as a share of disposable income is highest for middle income families and therefore may need some form of compensation for the increased costs.

¹⁰ In particular they investigated VAT reduction and different strategies of lump sum compensation.

¹¹ CSO (2006) EU Survey on Income and Living Conditions (EU-SILC) 2005.

many policy measures included in the Programme for Government that have not yet been undertaken, which may be suitable for funding by a portion of the carbon tax revenue.

Sectoral measures

In addition to an economy-wide carbon price, targeted sectoral policy measures are needed to enhance the effectiveness of the carbon tax. Some measures may require funding but others require structural or institutional change without significant cost. Sectors covered by the carbon tax should be invited to discuss carbon reducing measures that could be funded by revenues from the carbon tax. In most cases the advent of a carbon price will incentivise the introduction of measures to reduce greenhouse gas emissions. Sectors should be consulted to give input of the most effective funding of greenhouse gas saving measures, particularly in instances of public goods.

Transport¹²

Vehicle taxes are now aligned with CO₂ emissions; however they do not affect driving behaviour or demand. The following transport measures should focus on this aspect.

- Introduce ecodriving as part of the driving test for private and commercial licenses immediately. Require all driving instructors to undertake training. (Benefit – 15-20% reduction in emissions per vehicle, cost - negligible).
- Plan to introduce road pricing nationally.
- Review Transport 21 investment to prioritise modes that progress the sustainability agenda – economic, social and environmental goals. Include external costs in transport pricing and ensure planning includes sustainable transport at all stages.
- Make sure that all roads have footpaths so that people feel safe walking with children. This applies particularly to approach roads to schools in rural areas.
- Review and implement a national rural transport strategy.
- Integrate public transport ticketing in urban areas.
- Serious consideration must be given to improving the sustainability of Irish freight transport. A national distribution centre outside Dublin is required for freight transport to improve the logistics of small freight operators in particular and to enable the efficient use of existing infrastructure. Most freight transport in Ireland has its origin and destination within Ireland¹³ and better coordination of freight transport services is needed.
- Begin to plan for electrification of transport. Identify infrastructure needed for electric passenger cars.

Agriculture

- Provide incentives and training for farmers to engage in best practice in dairy cow, beef cattle, and slurry management. Ensure that changes in practice are captured by the inventory system.
- Invest significantly in agricultural research, specifically in greenhouse gas mitigation methods in the dairy sector.
- Value ecoservices properly so that farmers are incentivised to carry out ecological activities.
- Increase rate of public and private afforestation to increase the forests counted for carbon sequestration and that can be used for biomass.

¹² For more details on transport measures, the reader is referred to Comhar SDC response to the public consultation on the Department of Transport Sustainable Transport Action Plan available at <http://www.comharsdc.ie/files/Comhar%20STTAP%20report.pdf> (May 2008).

¹³ CSO (2007) Road Freight Transport Survey 2006.

- Provide support for the nascent biomass industry.
- Encourage further research in second generation biofuels.
- Investigate schemes for domestic offset projects to incentivise farmers to invest in greenhouse gas emissions saving activities.¹⁴

Services sector

- Refund a portion of carbon tax under condition that companies join energy-saving agreements.
- Implement green procurement requirement beginning with public sector.

Residential

- Eliminate fuel poverty.
- Provide grants to increase alternative fuel use in homes.
- Give tax credits to spending on energy efficiency measures such as home insulation.
- Continue grants for renewable heating and electricity systems.

Biodiversity

Safeguarding Ireland's biodiversity is a hugely important and urgent task. The role of biodiversity in providing health benefits and mitigating climate change should be recognised; for example, certain habitats can provide water attenuation and buffering of coastal areas, etc. Studies conducted at the National Botanic Gardens suggest that many native plant species are at risk of extinction due to climate change. The Government needs to maintain the momentum in addressing the challenges in protecting Ireland's biodiversity. This is particularly important in the light of a recent European Court of Justice Ruling against Ireland which will result in costly fines in the event of continued non-compliance of European requirements on nature conservation. The Budget should ensure that adequate resources are available to the National Parks and Wildlife Service and local authorities to meet their biodiversity obligations.

Conclusions

A carbon levy should be introduced immediately in the non-ETS sectors to send the right price signal across the economy that greenhouse gas emissions must be reduced. A carbon levy will have an "announcement effect" that is expected to cause individuals and business to find ways to reduce their CO₂ emissions. The carbon levy is not expected to be damaging to the economy and the revenue can be used to compensate vulnerable groups and encourage further emissions and labour tax reductions. This will cause growth in the economy and provide incentives for new innovation in the renewables sector. Investment is needed in environmental and energy research to ensure first mover advantage and long term growth in the sector.

Targeted policy measures are needed to reduce emissions in non-ETS sectors. Currently the transport and agricultural sectors are proving the most difficult from which to reduce emissions. Least cost measures in all sectors exist such as ecodriving and better planning in transport, cattle management in agriculture and insulation in buildings. These should be focussed on *a priori*. Revenue from the carbon levy should be used to invest in further longer-term abatement measures.

¹⁴ [Examples of domestic offset projects can be seen in France at: http://www.caissedesdepots.fr/spip.php?article662](http://www.caissedesdepots.fr/spip.php?article662)

Annex: Agreed Programme for Government progress report

In addition to the carbon levy, the Agreed Programme includes many policy measures, which if implemented could contribute to reductions in Irish greenhouse gas emissions. We have tabled the most relevant for sustainable development and greenhouse gas emissions mitigation and attempted to list the current progress made in each. It is clear from the table below that while in some areas progress has been made, in many others it has not. The introduction of a carbon tax would enable the funding of many of these measures to the benefit of the economy and environment.

Theme	Relevant action for greenhouse gas emissions reduction	Status
Competitiveness and Innovation		
NDP	Ensure carbon-proofing of ongoing investment	In process
Investment of €8.2 billion in Science, Technology and Innovation	Influence R&D to include sustainable development and growth in environmental areas	In process
Transport 21	Ensure carbon-proofing of investment	Not transparent
Education and training	Include sustainable development at all levels	No. Education for SD action plan not delivered as yet
Low corporate taxes	Link to environmental performance	No
Fair Tax system		
Change PRSI	Link lower labour taxes with carbon taxes	No
VRT and motor tax change	Restructure to reflect vehicle environmental performance	Yes, since July 2008
Carbon levy	Implementation with best design and appropriate level	No
Cost-benefit analysis of tax expenditures	Divert revenue to environmental fund or recycle back to sectors where appropriate.	Not yet relevant
Fiscal measures to improve environment	Design of polluter pays system	Vehicle taxes show only example.
Future financing of local government	Examine in context of governance, planning implications, sufficient resources for sustainability officer, waste etc.	Local government reform does not address the issue.
VAT		
Reduce VAT on environmental goods	Link VAT system for “environmental goods” & carbon levy.	Not yet.
House ownership		
Reduction of stamp duty	Link to environmental performance.	No
Ireland working		
Low taxes on employment	Linked to higher carbon taxes.	No

Higher R&D investment	Development of environmental services and related innovative sectors	Yes, Charles Parsons Research initiative – progress in energy research.
Competition and consumer protection		
Labelling	Design simple labelling system for all goods with environmental information	No
Skills for the future		
Investment in education and training	Develop skills useful for promotion of sustainable economy	Yes
Knowledge economy		
R&D investment	Develop priority areas for low carbon future with efficient investment and implementation	More needed, no systematic programme.
Social partnership		
Value for money	Include environmental externalities in project estimations, at least carbon-proofing	No
Transport	Many measures mentioned in this area. In general cost-benefit analysis and carbon-proofing should be undertaken.	
Multi-criteria analysis	Include environmental factors and design standard methodology	On-going.
Dublin transport authority	Link transport actors to provide integrated infrastructure with attractive public transport alternatives.	No. Part of new DTO strategy?
Energy		
Environmental sustainability	Accelerate the growth of renewable energy to one third of electricity consumed by 2020.	Ongoing
	Introduce co-firing into the 30% biomass by 2015.	Planned
	Promote green energy technologies and the sustainable use of energy in transport.	No
	Introduce a biofuels obligations scheme by 2009.	Consultation to begin shortly.
	Introduce new energy-saving building standards by 2007.	Yes
	Stimulate the development of alternative energy sources.	Yes
	Maintain the REFIT scheme.	Yes
Environment		
Climate change	Introduce a carbon levy.	No
	Create new opportunities for farmers by moving agriculture to a new system of food and power production.	No
	Introduce a min. requirement of biofuels use in public transport vehicles.	No
	Reform the VRT and motor tax systems to encourage good environmental behaviour.	Yes
	Phase out incandescent light bulbs.	Yes, ongoing.

	Implement energy efficient measures in the public sector.	
	Targeted grant schemes should be used to ensure the development of renewable energy heating schemes.	Yes
	Introduce smart electricity meters.	Pilot projects launched.
Carbon report		
	Annual report with indicators for carbon emissions.	Yes, December 2007
Waste	Do not give a competitive advantage to incineration.	Review ongoing.
Environmental protection	Ensure that flat rates on waste will be abolished and weight-based charges implemented.	Partly.
	Invest significantly in local government environmental enforcement capacity.	No
Water	Ensure that County development plans are sustainability-proofed.	No
	Finish upgrading all the local group water schemes. And ensure that public water supplies deliver a reliable service.	No, ongoing
Environmental Technologies	Support the development of environmental technologies to improve Ireland's competitiveness and environmental performance.	See R&D measures.