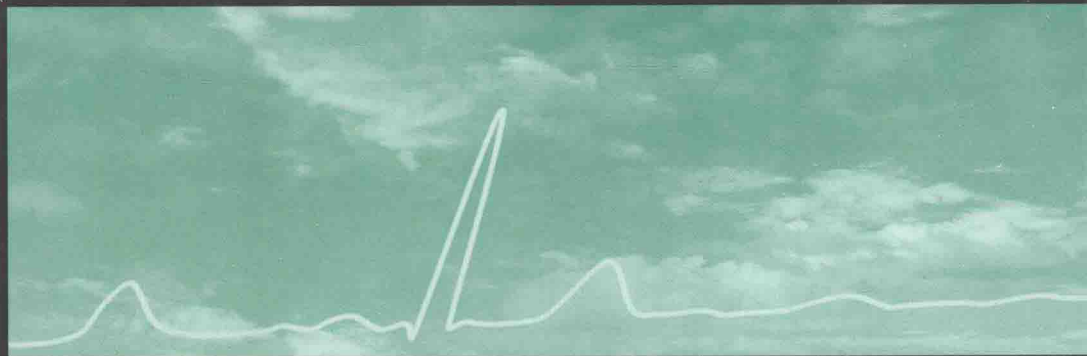


Editors

Hope Ashiabor, Kurt Deketelaere,  
Larry Kreiser, Janet Milne



# CRITICAL ISSUES IN ENVIRONMENTAL TAXATION

International and Comparative Perspectives:  
Volume II



OXFORD

# **Critical Issues in Environmental Taxation**

**International and Comparative Perspectives**

**Volume II**

**Editors**

**Hope Ashiabor  
Kurt Deketelaere  
Larry Kreiser  
Janet Milne**

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# Preface

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Critical Issues in Environmental Taxation II is an international refereed publication devoted to environmental taxation issues on a worldwide basis. It seeks to provide insights and analysis for achieving environmental goals through tax policy. By sharing the perspectives of the authors in response to the diverse challenges posed by environmental taxation issues, effective approaches used in one country may be considered and possibly implemented by governmental authorities in other countries.

This volume (the second in the annual series) contains 37 articles written by authors from 12 countries, with the articles grouped into five categories by topic. Preliminary drafts of the articles were previously presented at the Fourth Annual Global Conference on Environmental Taxation Issues held on June 5–7 2003 in Sydney, Australia. The articles in this volume were selected after being subjected to a rigorous peer review process.

The articles are interesting, thought provoking, and have been written by some of the best environmental taxation scholars in the world. We hope you enjoy reading them and reflecting on the perspectives of the authors.

Editors

Hope Ashiabor

Kurt Deketelaere

Larry Kreiser

Janet Milne

# Contents

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## Part I

### Environmental Taxation in General

- 1 Implementing Green Tax Reforms in OECD Countries: Progress and Barriers 3  
*Jean-Philippe Barde*
- 2 Environmental Tax: The Weakening of a Powerful Theoretical Concept 23  
*Claudia Soares*
- 3 Environmental Management by Local Environmental Taxes: Their Theoretical Foundations and Tax Designs 51  
*Toru Morotomi*
- 4 Political Economy of Environmental Policy Choice: Single-Instrument Policy of Taxes or Direct Regulations vs. Policy Mix with Subsidies 69  
*Soo-Cheol Lee*
- 5 The Internalization of Environmental Capital in a Keynesian Model of Income Determination: Revised Approaches to Public Policy 85  
*Dodo J. Thampapillai, Shandre M. Thangavelu, Euston Quah and Pundarik Mukho Padaya*

## Part II

### Taxation of Energy

- 6 EC Transport Policy and Environment and Energy Taxation 99  
*Kurt Deketelaere*
- 7 Energy Taxation and Competitiveness – Special Provisions for Business in Germany's Environmental Tax Reform 135  
*Michael Kohlhaas*
- 8 What is the Most Effective Tax Scheme to Reduce Electricity-Related Greenhouse Gas Emissions? 147  
*Thomas Groh, Olivier Teissier, Stéphane Gallon and Boris Cournède*
- 9 The Use of Environmental Taxation Incentives to Foster Investment into Renewable Energy: Challenges and the Way Forward 169  
*Larry Kreiser and Hans Sprohge*
- 10 New Economic Instruments to Foster Renewable Sources of Energy: An EC Law Approach 177  
*Yanna G. Franco and Pedro M. Herrera*
- 11 Tax Incentives for Renewable Energies as a Means of Fostering Sustainable Development in Spain 191  
*Pablo Chico, Amparo Grau and Pedro Herrera*

12	Fiscal Instruments to Promote Renewable Energy in the Netherlands and Why They Were Not Continued <i>Victor Cramer</i>	201
13	Harnessing the Wind: The Role of Tax Incentives as a Strand in the Reins <i>Janet E. Milne</i>	215
14	Influence of Tax Policy on Green Power Utilization: An Empirical Investigation of Consumer Preferences <i>Wendy Wilhelm, Julie Lockhart and Thomas J. Olney</i>	243

### **Part III**

#### **Environmental Taxation and Economic Considerations**

15	Environmental Taxes and International Competitiveness: Do WTO Border Adjustment Rules Constrain Policy Choices? <i>Jan McDonald</i>	273
16	The Impact of Environmental Taxes and Regulatory Policies on Economic Growth <i>Alan K. Reichert</i>	293
17	Double Dividends in a World with Natural Capital <i>Gary Wolff</i>	305
18	The Effect on Market Structure as a New Decision Factor for Choosing among Pollution-Emission Taxes and Permits <i>Miguel Buñuel</i>	323

### **Part IV**

#### **National Experiences with Environmental Tax Instruments**

19	When Should We Use Taxes to Address Environmental Issues? A Policy Framework and Practical Agenda for Australia <i>Steve Hatfield Dodds</i>	347
20	Taxation and the Environment: The Challenges for Tax Administration (the Australian Perspective) <i>Michael D'Ascenzo</i>	363
21	The OECD Critique of Australia – Some Responses <i>Alex Low and David Smiley</i>	371

### **Part V**

#### **Transportation and Environmental Taxation**

22	Practical Lessons from Applying Environmental Taxes and Market Based Instruments in New South Wales <i>Simon A.Y. Smith</i>	389
23	Paying for PlanFIRST: Financing Reform in Environmental Planning <i>Robert G. Stokes</i>	397

24	Environmental Taxation Implications of Using Ethanol as a Biofuel in Road Transport in Australia <i>Peter Gillies and Joseph Cleworth</i>	413
25	Use of Taxation Policy in Encouraging Ecological Sustainable Development: The Australian Tax Treatment of Environmental Impact Assessment Expenditure <i>Anna Mortimore</i>	421
26	Advancing Biodiversity Conservation in Canada through Ecological Fiscal Reform – The Current Situation and Future Potential <i>Nathalie Chalifour</i>	439
27	Holding up the Sky: Protecting China's Natural Environment <i>Bill Butcher</i>	469
28	Can a Constitutional Reform Help Implementing Ecotaxes? Lessons from the French Experience <i>Stéphane J. Gallon, Emmanuel P. Massé and Laurent N. Verdier</i>	477
29	Implementing Environment Policy-Mixes in France and Overcoming Competitiveness and Distribution Issues: Application to Agriculture <i>Xavier Delache, Richard Smith and Mélanie Tauber</i>	487
30	The Economic Effects of an Environmental Tax Reform in Germany <i>Michael Kohlhaas</i>	507
31	Harmful Tax Measures and Greying of Taxation in the Netherlands: What Went Wrong? <i>Michael Faure and Stefan Ubachs</i>	521
32	Environmental Tax Reform in New Zealand: The Agenda <i>Ken Piddington and Frank Scrimgeour</i>	533
33	Environmental Taxation in Spain <i>Susana Bokobo</i>	543

## Part VI

### Perspectives on Environmental Taxation

34	Coase's Curse: How the Coase Theorem has Biased the Debate of Eco-instruments and Paralyzed Environmental Policy <i>Anselm Görrres</i>	557
35	Public Policy! Front and Center! Can Eco-taxes Counter Subsidies? <i>Jeffery J. Smith</i>	567
36	Promoting Environmental Taxes <i>Richard A. Westin</i>	575
37	Land Value Taxation: The Overlooked but Vital Eco-tax <i>Karl Williams</i>	589

# PART I

## ENVIRONMENTAL TAXATION IN GENERAL



# 1

## Implementing Green Tax Reforms in OECD Countries: Progress and Barriers

---

BY

JEAN-PHILIPPE BARDE<sup>†1</sup>

Since the implementation of environmental policies in OECD countries in the early 1970s, economists have been promoting static and dynamic efficiency through the use of “economic instruments” (mainly taxes, charges and tradable permits); however the progressive implementation of these policy instruments has been a long evolutionary process [Barde (1992, 1999), OECD (1994)]. Presently two key evolutions are taking place: more consideration is given to the use of tradable permits, in particular to reduce CO<sub>2</sub> emissions, and environmentally related taxes, fees and charges are used increasingly, sometimes in the context of broader “Green Tax Reforms”. Fiscal instruments provide an effective means of injecting appropriate signals into the market and of internalizing externalities, while at the same time improving the efficiency of existing measures. If properly conceived and implemented, green tax reforms can contribute to a structural adjustment of economies.

### 1. WHAT ARE ENVIRONMENTALLY RELATED TAXES?

OECD (and IMF) define a tax as a compulsory, unrequited payment to general government. Taxes are unrequited in the sense that benefits provided by government to taxpayers are not normally in proportion to their payments. The term environmentally related taxes is used by OECD to describe any tax levied on tax-bases deemed to be of particular environmental relevance. A list of the relevant tax-bases was selected in close co-operation between the European Commission, IEA and OECD.

There has been some controversy about terminology and definitions: the literature abounds with reference to “eco-taxes”, “green taxes” “environmental taxes”, etc. Some argue that what matters is the explicit purpose of the tax (sometimes disregarding whether it is effective or not). It is also argued that, if not expressly baptized as “environmental” or “green”, taxes would lose political support. In fact, what matters is the economic rationale and effectiveness of the taxes; this is why OECD, in co-operation

<sup>†</sup> Dr. Jean-Philippe Barde is Head of the National Policies Division of the OECD Environment Directorate in Paris and is in this context in charge of the OECD work on taxation and environment. Dr. Barde is also invited professor at the European School of Advanced Environmental Studies (University of Pavia, Italy) and the Institut des Hautes Etudes en Administration Publique (Institute for High Studies in Public Administration) of Lausanne, Switzerland. He is also member of several scientific committees and of the “Commission des Comptes de l'Economie et de l'Environnement” (French Ministry of Environment). He has authored several books and articles on environmental policy and environmental economics.

<sup>1</sup> The opinions expressed in this paper are those of the author and do not necessarily reflect the views of the OECD. This chapter is mainly based on OECD work; parts draw from Barde, J.Ph. and Braathen, N.A., Environmentally Related Levies in, S. Cnossen, ed. *The Economics of Excise Taxation*, Oxford University Press, forthcoming.

with IEA, EUROSTAT and the European Commission has developed the concept of “environmentally related taxes”: this implies that the name, or the expressed purpose, of a given tax is not a criterion for deciding whether or not a tax is relevant for the environment, *inter alia* because the names used and the expressed purposes are often somewhat arbitrary, and because the purposes of a given levy can change over time. The focus is instead on the potential environmental effects of the given tax, which is determined by how the tax impacts on the producer and consumer prices in question, in conjunction with the relevant price elasticities. A €0.50 tax per litre unleaded petrol would – for example – have exactly the same environmental effects regardless of the name of this tax, and regardless of whether the expressed purpose is to raise revenue or to combat climate change. For instance, even if existing fuel taxes are not expressly designed as “environmental”, they are “environmentally related”, and one could imagine what would be the level of road traffic, air pollution, congestion and noise in the absence of such taxes, even if they should arguably be better designed and set at higher levels.

A clear distinction must also be made between taxes and charges. Environmental charges are a payment for a specific service, such as waste collection and treatment or sewerage and collective water treatment facilities. Taxes and charges can apply on emissions or products: emission taxes/charges are direct payment on the quantity and quality of polluting discharge such as water effluents, waste or noise. Product taxes/charges apply to specific products such as fuels (or sulphur content of fuels), motor vehicles, packaging, pesticides, fertilizers, etc. Product taxes/charges can also apply to inputs when the taxed items are used in production processes (e.g. fuels or fertilizers).

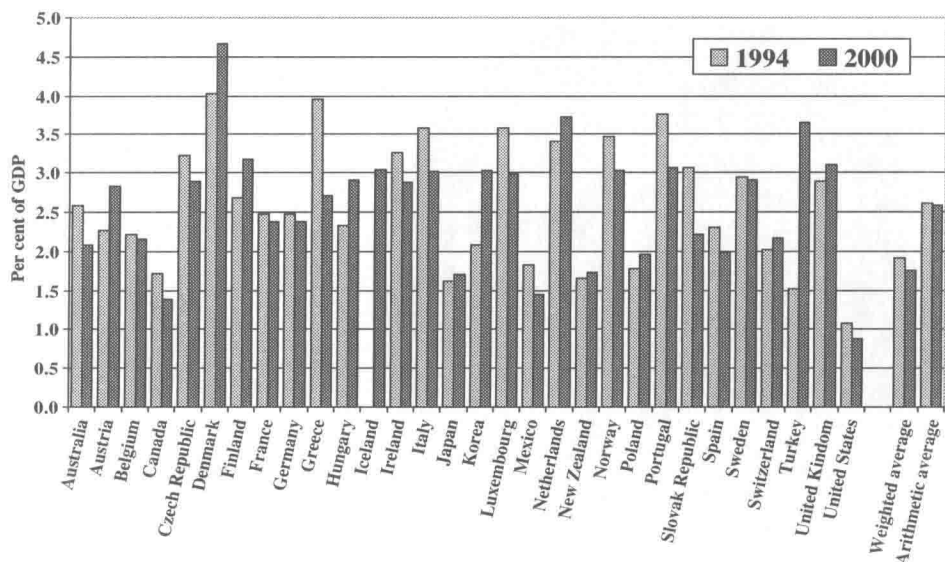
The OECD has collected information on environmentally related taxes (ERTs) in a special database, in co-operation with the European Commission, the European Environment Agency<sup>2</sup> and the International Energy Agency. This database now also contains information on many environmentally related required payments to the government, such as fees and charges that are levied more or less in proportion to services provided (e.g. the level of wastes collected and treated). The term levy can be used to cover both taxes and, fees and charges. The database is freely available, through a large number of pre-defined queries, at [www.oecd.org/env/tax-database](http://www.oecd.org/env/tax-database), and contains information on *inter alia* tax-bases, tax rates, exemptions, refund mechanisms, revenues raised, administrative set-up, sources of additional information and contact persons.

Figure 1 shows the revenue of environmentally related taxes in percent of GDP in OECD countries in 1994 and 2000 (not including revenues from fees and charges, e.g. used in water supply and waste handling). It can be seen that the taxes in question rise in the order of magnitude 2 to 5% of GDP in revenues on average, ranging from 1% to 4.5%.

Figure 2 illustrates the revenue in percentage of total tax revenue; the OECD average is 7% of total tax revenue. This should be interpreted with caution: the fact that ERTs rank high in some countries is not an indicator of the “greening” of the tax system nor of the effectiveness of the environmental policy; it also reflects the general structure of

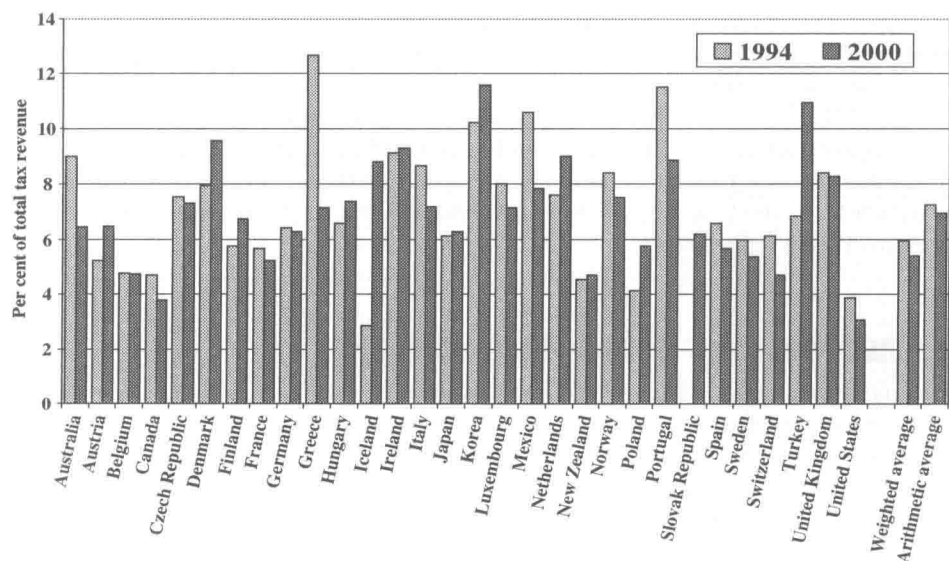
2 The database originally covered only the (now) 30 OECD member countries. However, through the co-operation with EEA, information has also been collected for 10 EEA member countries and countries otherwise related to EEA, not being members of OECD (Albania, Bosnia-Herzegovina, Bulgaria, Croatia, Estonia, FYR of Macedonia, Latvia, Lithuania, Slovenia and Romania). For simplicity, these countries are referred to here as the EEA countries, even if the majority of the OECD countries are also members of EEA.

**Figure 1: Revenues from environmentally related taxes in per cent of GDP**

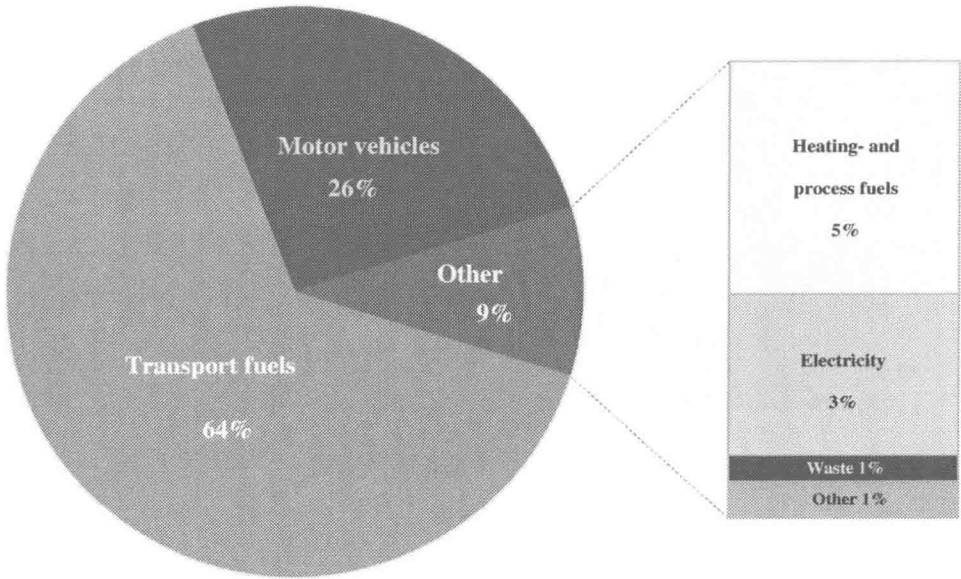


Source: OECD/EU database on environmentally related taxes.

**Figure 2: Revenues from environmentally related taxes in per cent of total tax revenue**



**Figure 3: Shares in total revenue from specific ERTs**



Source: OECD/EU database on environmentally related taxes.

the tax system, for instance in countries where gasoline taxes account for a high share of total tax revenue.

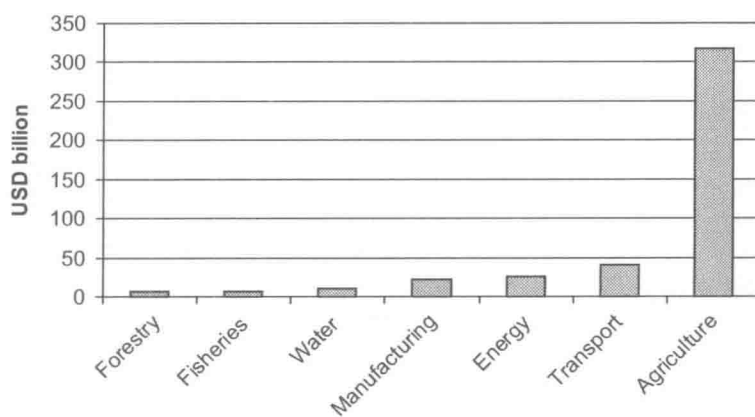
Figure 3 indicates the share of specific tax bases in per cent of total revenue raised through ERTs. It can be seen that motor fuels and motor vehicles largely dominate: more than 90% of all the revenues from environmentally related taxes are raised on motor fuels and motor vehicles. Very small revenues are raised on tax-bases such as heavy fuel oil, coal and coke – which typically are used in heavy industries. The figure is based on data for 1995, but the main findings are still valid. This implies that currently the bulk of ERTs is paid by households and a very small part by industry; this is due, in particular, to the large number of exemptions granted to the private (mainly energy intensive) sector (see below).

**2. GREENING TAX SYSTEMS: POLICY OPTIONS**

Most OECD countries have undertaken significant (general) tax reforms since the end of the 1980s, chiefly in three ways: first, by reducing tax rates in the higher income tax brackets (which fell on average by more than ten percentage points between 1986 and 1997) and lowering corporate tax rates (down ten points over the same period); second, by broadening the tax base; and third, by giving a greater weight to general consumption taxes such as VAT.

Such reforms provide an excellent opportunity to introduce an environmental dimension in taxation, i.e. a “greening” of tax systems. Starting in the early 1990s, a number of countries, in particular in the EU, have implemented so-called “Green Tax

**Figure 4: Environmentally harmful subsidies in OECD countries (most recent years)**



Source: Based on Honkatukia (2002).

Reforms”, which generally can consist of three types of approach:

- reduction or elimination of environmentally harmful subsidies, including direct public expenditures, “market price support” and/or exemptions and other provisions in environmentally related taxes;
- restructuring of existing taxes according to environmental criteria; and/or
- introduction of new environmentally related taxes.

## 2.1 Elimination of environmentally harmful subsidies

Many fiscal measures can either directly or indirectly produce adverse effects for the environment. One such measure is direct subsidies.<sup>3</sup> For example, subsidies to agriculture in OECD countries (estimated at \$318 billion in 2002, or 1.2% of GDP) are one of the causes of overfarming of land, excessive use of fertilizers and pesticides, soil degradation and other problems [OECD 1998, 2003a]. In 1999, subsidies to fisheries amounted to \$6 billion, representing 20% of the value of landing. This can cause the overcapacity of the fishing fleet and the exhaustion of the fish stock. Similarly, irrigation water is often charged below marginal social cost, which leads to wastage. Subsidies for energy production in OECD countries, intended mainly to protect domestic producers and maintain employment in given industries, are estimated to amount to about US\$20 billion per year, a third of these going to support coal production, the most polluting fuel. Industry is also subsidized, although it is difficult to obtain detailed data (industry subsidies were estimated at \$44.1 billion in 1992). When subsidies encourage the use of certain raw materials and greater energy consumption, there can be negative fallout in terms of recycling and waste, and a lock-in of inefficient technologies.

More indirect subsidies arise from specific tax provisions (tax rate variations or exemptions), which are environmentally harmful. For instance, coal, the most polluting

<sup>3</sup> For a detailed assessment on subsidies, see OECD (1998).

fuel, is only taxed at all in five OECD countries, and in these countries the most important coal users are subject to many tax exemptions and rebates. The transport sector, a major source of pollution and other harmful effects, is also affected by many indirect subsidies: a case in point is the widespread under-taxing of diesel oil in many countries.

## **2.2 Restructuring existing taxes**

Many *existing* taxes could be changed so as to benefit the environment, by increasing the relative prices of the most polluting tax-bases. Since energy is one of the main sources both of pollution and of tax revenue, an “environmental” restructuring of energy taxes is essential. For instance, in most OECD countries, taxes on motor vehicle fuel account for over 50% of the pump price. This leaves large scope for restructuring the fuel taxes on the basis of environmental parameters, such as sulphur content, as the Nordic countries, Germany, Ireland and the United Kingdom have done.

Taxes on other energy products, for example fuels used for heating purposes and in industrial processes, can also be differentiated according to environmental criteria – as, for example, carbon and/or sulphur content. It is also possible to restructure taxes on motor vehicles (both one-off sales taxes and annual taxes on vehicle usage), for example according to the environmental characteristics of the fuel it uses, according to the estimated fuel consumption, and/or according to whether or not the vehicle is equipped with a catalytic converter. In Switzerland, such differentiation has now been combined with accurate metering of the number of kilometres driven by heavy vehicles.

## **2.3 Introducing new environmental taxes**

An obvious option is to introduce *new* levies whose prime purpose is to protect the environment. These may be taxes on *emissions* (for instance on atmospheric pollutants or water pollution) or on products that are closely related to environmental problems. The latter are more frequent. Since the early 1990s, many environmentally related taxes have been introduced on products ranging from packaging to fertilizers, pesticides, batteries, chemical substances (solvents), lubricants, tyres, razors and disposable cameras. The OECD/EU database provides more information on a large variety of such levies.

## **3. GREEN TAX REFORMS IN OECD COUNTRIES: AN OVERVIEW**

Since the early 1990s, several countries, mainly in the EU, have introduced comprehensive green tax reforms (GTR). One commonality is the maintenance of a constant tax burden, in the sense that new, or increased, environmental taxes are offset by reductions in existing taxes (tax shift). In most cases, the tax shift is concentrated on a reduction of the tax burden on labour with the objective of reducing unemployment. Whether this so-called “double dividend” approach would actually provide increased employment, remains highly debated (see Section 4.1 below).

*Finland* was the first country to introduce a carbon tax in 1990, followed by a progressive greening of the tax system. While the carbon tax started in 1990 at a fairly modest level of €4.1 per tonne of carbon, the rate was steadily increased until 1998, to

reach €62.9 per tonne carbon. The greening of the tax system includes other measures, such as the implementation of a new waste landfill tax in 1996. In addition, Finland has, inter alia, taxes on motor vehicles, on beverage containers, and a charge on electricity generation in nuclear power plants, meant to finance nuclear waste management. The increase in green taxes was (more than) compensated by a reduction of the tax wedge on labour (decreased income tax and social insurance contributions), with the explicit objective to reduce unemployment.

Norway implemented a CO<sub>2</sub> tax on mineral oils in 1991 (€0.055 per litre), which was then extended to coal and coke for energy purposes (€0.055 per kilo), limestone and gas (with important exemptions). In 2002, the CO<sub>2</sub> taxes covered about 64% of total Norwegian CO<sub>2</sub> emissions. A broad tradable permit system, which would replace existing CO<sub>2</sub> taxes and also cover most of the currently exempted sectors, is under preparation. A tax on the sulphur content in fuels is also applied, at €2 per kg of SO<sub>2</sub>. Due to a favourable employment situation, less emphasis has been placed on achieving a double dividend; however, part of the revenue of environmentally related taxes was affected due to a reduction in the income tax. A number of other environmentally related taxes are applied to various products, such as motor vehicles, pesticides and on various types of packaging and waste.<sup>4</sup>

In Sweden, a major revenue-neutral tax reform was introduced in 1991. It was based on a significant reduction in income tax, which was offset by a broadening of the VAT tax base and by a series of new environmental taxes, especially on carbon and sulphur. When a CO<sub>2</sub> tax of SEK 250 (€27) per tonne was introduced in 1991, the energy taxes on industry was halved, nevertheless resulting in higher energy taxation overall. In 1997, the rebate to the manufacturing sector was reduced to 50%. The rates of the CO<sub>2</sub> tax vary according to the type of fuel [Nordic Council of Ministers (1999)]. The sulphur tax (€3.25 per kg) is imposed on peat, coal, petroleum, coke and other gaseous products. A tax differentiation is applied to three different categories of diesel oil, according to their sulphur content. Other energy-related taxes with an environmental purpose are also applied (e.g. consumer and producer taxes on electricity, tax on domestic air traffic, etc.). Sweden also has a charge on nitrogen oxides emissions – where all the revenue is refunded to the power plants covered by the charge, in proportion to the amount of energy they generate.

Denmark introduced a CO<sub>2</sub> tax on fuels in 1992 and has been engaging in a general reform of its tax system, since 1994 with a continuing evolution of energy-related taxes until 2002 [Larsen (1998)]. The national target is to reduce CO<sub>2</sub> emissions by 20% in the period 1988–2005. The tax reform aimed at a reduction of marginal tax rates in all income brackets and a gradual transfer of tax revenue from income and labour to pollution and scarce environmental resources [Danish Ministry of Finance (1995)]. Between 1992 and 1996, industry was exempted from the energy tax and the electricity tax and paid 30 to 50% of the CO<sub>2</sub> tax thanks to various exemptions and recycling of revenue. A milestone of the Danish tax reform was the introduction in 1996 of the “Energy Package”, consisting mainly in an increase of the CO<sub>2</sub> tax (with considerably reduced rates for industries opting in a binding three-year voluntary agreement) and of a tax on SO<sub>2</sub> emissions (€1.35 per kg of SO<sub>2</sub>). The revenue raised by these taxes reverts entirely to industry in the form of reduced employers’ social security contributions

4 A tax on measured emissions from waste incinerators is being prepared.