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Encouraging Environmentally Sustainable Growth in Belgium

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ENCOURAGING ENVIRONMENTALLY SUSTAINABLE GROWTH IN BELGIUM

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by
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ABSTRACT/RÉSUMÉ

This document analyses aspects of environmental policy in Belgium. Some specific examples are drawn from policies on water in the different regions that make up the Belgian Federation (to whom much environmental policy is delegated), and transport and congestion policy in the Brussels region is discussed. The system of "ecotaxes" and some inconsistencies in the structure of taxation, from the environmental point of view - for example between petrol and diesel fuel - are also covered. An important theme is the institutional complexity involved in many aspects of environmental policy. Co-ordination is necessary between regional governments and the federal government, as well as with local governments, implementing policies which are often based on EU directives.

JEL Classification: H23, Q00, Q20, Q28, Q40, Q48
Keywords: Belgium, sustainable development, environmental policy.

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Ce document analyse certains aspects de la politique de l'environnement en Belgique. Quelques exemples sont tirés de la politique concernant l'eau dans les différentes régions qui constituent la Belgique (auxquelles la responsabilité de la politique environnementale est déléguée), et la politique concernant les transports et les congestions dans la région de Bruxelles est discutée. Le document analyse également le système des écotaxes et certaines incohérences dans le structure de la fiscalité du point de vue de l'environnement - par exemple entre l'essence et le gazole. Un thème qui ressort est celui de la complexité institutionnelle dans de nombreux aspects de la politique environnementale. La coordination est nécessaire entre les gouvernements régionaux et le gouvernement fédéral, ainsi qu'avec les autorités locales, qui mettent en œuvre des politiques souvent fondées sur des directives de l'Union européenne.

Classification JEL : H23, Q00, Q20, Q28, Q40, Q48.
Mots clés : Bélgique, développement durable, politique environnementale.

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ENCOURAGING ENVIRONMENTALLY SUSTAINABLE GROWTH IN BELGIUM[1]

Paul O'Brien, David Carey, Jens Høj and Andreas Woergoetter[2]

1. Belgium's small size and high population density, its history of industrialisation and intensive agriculture, and its location along important transport routes strongly influence the kind of environmental problems it faces. However, these problems are far from uniform: nitrates in surface water are a particular problem in intensive livestock-rearing areas of Flanders, less so in Wallonia, though Walloon rivers frequently fail to meet the water quality standards that would be required for their popular recreational uses, because of insufficient wastewater treatment facilities; a concentration of chemical and petrochemical industries near the border of Flanders with the Netherlands gives rise to transboundary issues, as does the flow into shared estuarial and coastal waters of the two major Belgian river systems; urban traffic problems are particularly acute and growing in Brussels. These problems are generally regional or local responsibilities, while the Göteborg and Kyoto Protocols give rise to national targets for emission reductions.

2. Over the last two decades, particularly compared with some northern European countries, environmental policy has generally been less of a focus of attention in Belgium than in many other OECD countries. This may be partly due to the high priority attached to fundamental constitutional issues[3] in the 1970s and 1980s, when in many other countries environmental legislation was developing rapidly.[4] Since then a considerable amount of work has be carried out in creating coherent environmental management frameworks and for governments to take steps towards eliminating the backlog in measures to reduce the pollution burden. With the completion of constitutional reforms, environmental responsibilities have been much more clearly defined, albeit within the context of institutional arrangements that are necessarily more complex and cumbersome than in most other countries.[5] However, during most of the 1990s Belgian authorities were also heavily occupied with meeting the Maastricht criteria for participating in the European monetary union. It is, therefore, not surprising that in those areas where policy initiatives have been targeted on increasing the environmental sustainability of the economy, the main concern of the Belgian authorities appears to have been the implementation of the legislative requirements of EC directives. In this respect, little original assessment of the environmental effectiveness of these measures or

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1. This paper was originally produced for the OECD Economic Survey of Belgium, which was published in March 2001 under the authority of the Economic Development Review Committee. Working papers on the same subject have been published for Norway, Finland, Germany, the United States, Denmark, Sweden, Canada and Poland and are forthcoming for a number of other countries

2. P. O'Brien, D. Carey, J. Høj and A. Woergoetter are economists in the OECD Economics Department. The authors thank Ann Vourc'h, Jorgen Elmeskov and Mike Feiner, as well as colleagues in the OECD Environment Directorate, for their comments, and Veronica Humi, Anick Lotrous, Josette Rabesona and Diane Scott for technical assistance.

3. Tombeur (1998), p. 34 interviewed federal and regional policymakers and reports that they are "convinced that the political investments in the institutional transformation were at the expense of new political objectives, one of them being environmental recovery, management and protection". In their view, "it took at least a decade to reach an institutionally stable organisation". OECD (1998), p. 19 also reflects this view.

4. Deketelaere (1999) makes the point that a new wave of environmental awareness coincided with the completion of the constitutional reforms in 1993.

5. See OECD (1998), p. 19.

of their economic cost seems to have been undertaken. More recently however the situation has changed somewhat: all regions have developed plans which set objectives for future action, make some provision for assessing progress and, in some cases, mandate assessments of costs and benefits.

3. The next section outlines the institutional structure in which environmentally relevant policy evolves and the following sections look at aspects of particular environmental issues - water quality and water supply, transport, emissions of greenhouse gases and acid rain precursors - in the three regions and at federal level;[6] subsequent sections discuss the "ecotaxes" and the role of the sustainable development plan. This selection is certainly not comprehensive and does not cover the full complexity of sustainability issues in Belgium.

1. Institutions

4. Belgium is a federal state comprised of three communities (Flemish, French and German-speaking) and three regions (Flanders, Wallonia and Brussels-Capital).[7] In contrast to other federations, there is no hierarchy among the federated entities: each, including the federal government, is equal in law. The Federal Government is responsible for all matters that, for technical and economic reasons, require uniform national treatment; for example, control of air pollution from mobile sources. Other federal responsibilities with respect to environmental policy include product policy (standards, taxes, labelling, environmental advertising), protection from ionising radiation, management of radioactive waste, transit of waste and marine environment protection. The regions retain most responsibilities in environmental policy. These include environmental planning, protection of the environment (water, air, soil, noise - with the exception of ionising radiation), waste management (with the exception of inter-state transit), control of legislation on of dangerous, unhealthy or nuisance installations, drinking water supply, nature conservation and certain aspects of scientific research. The regions determine objectives and appropriate policy instruments and carry out enforcement.

5. In accordance with their tax-levying powers, the regions are authorised to introduce green taxes insofar as no such tax already exists at the federal level. Taxes on effluent discharge and waste disposal are reserved for the regions. Even where an issue is a matter of federal competence, the regions can take measures as long as those are identical in each of the three regions, so as to avoid tax competition among the regions. Of the sectoral policy areas with most relevance to environment policy, transport is a federal responsibility concerning railways and air transport, while energy (except taxation), mobility, environmental planning and (from 1 January 2001) agriculture[8] are mainly regional responsibilities and land use is mainly a local government (city administrations) responsibility. This allocation of responsibilities facilitates integration of local environment concerns in agricultural policy, and provides room for considering supra-regional environmental concerns while formulating an appropriate transport policy, the field in which much remains to be done to de-couple growth in emissions from economic growth.

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6. Since policies frequently differ between regions, a complete analysis under each heading would often require discussion of three, sometimes four, sets of legislation and experience. This would be impractical in the space available, so in some cases discussion is not "balanced" but concentrates on developments in a particular region or regions. According to Deketelaere (1999) policy and policy enforcement varies between the regions.

7. See OECD (2001*a*) Chapter II. A detailed description of the State structure, Division of powers and Fiscal competencies in Belgium is found in Deketelaere (1997).

8. The international aspects of agriculture policy remain a federal responsibility.

6. The counterpart to the juridical autonomy of the federated entities is extensive policy co-ordination arrangements.[9] Principal among these is the Inter-ministerial Conference on the Environment (CIE). It comprises representatives from the Federal Government and each of the regional environmental authorities and examines issues where inter-government co-operation is necessary or would be helpful, to implement environment policy. In some cases, such as product rules, rules dealing with industrial accident risk and regulations on the transport of waste across boundaries, consultation is compulsory. An important working group of the CIE is the Co-ordination Committee for International Environmental Policy (CCPIE). It is the main body for international environment policy co-ordination, except in respect of EU environmental policy. Despite not being responsible for policy co-ordination in respect of EU environmental policy, the CCPIE can co-ordinate *ad hoc* technical matters in this field, including the technical aspects of implementing of EC directives (Tombeur 1998, p. 28). The European Affairs Division of the Federal Ministry of Foreign Affairs is responsible for policy co-ordination in respect of European environmental policy.

7. Both the CIE and the CCPIE work on the basis of consensus. In the event that no consensus is reached, no action can be taken: unilateral action would be likely to result in a legal challenge that would reverse the action. In disputed cases Belgium could abstain from the relevant decisions taken at the international level but of course remains subject to them. Another important co-ordination mechanism is the Inter-regional Cell for the Environment (IRCEL/ CELINE), which concerns co-operation between the regions alone. Inter-regional agreements concerning information exchange and waste packaging have been concluded in this forum in recent years. A recent protocol between the three regional ministers of environment establishes a basis for consultation and co-operation on other matters to be mutually agreed each year. Federal and regional governments also consult with each other through Inter-ministerial Conferences on the economy and energy, traffic and infrastructure, and agriculture. Where the federated authorities fail to act in accordance with the judgement of an international or supra-national court, the federal government can act unilaterally to ensure that the judgement is respected.

8. The regions are obliged to consult the social partners and environment groups on all proposed environment measures. This is done through the environment councils. They analyse the measures and advise their government as to their opinion on the adequacy and economic effects of proposed instruments. At the federal level, a Federal Council for Sustainable Development was created in 1993. This Council has to be consulted on the draft Plan on sustainable development, and advises the government on sustainable-development-related actions and legislation.

9. Natural or legal persons with a personal, direct, positive and lawful interest can appeal against administrative acts or government action/non-action in the field of environmental policy. Interested parties can include environment protection groups. It is also possible to make a complaint to the concerned European institutions in relation to the non-enforcement of environmental legislation. Natural or legal persons can also sue enterprises or other citizens that pose a threat to the environment. To do so, the natural or legal person bringing the action must demonstrate that they have suffered a loss caused by the other party's negligence (they violated the general duty of care or breached a statutory duty).[10] However, it is not possible for a natural or legal person to bring such an action against a government that has not breached a

9. This issue is especially mentioned in Braden and Proost (1997), p. 1. The authors finally come to the conclusion that a federation can actually handle environmental problems better, if it is able to carry out the co-ordination and co-operation tasks among the local governments more efficiently than a sequence of bilateral negotiations (*ibi*d., p. 12). Solving environmental problems could, therefore. be considered as one of the benefits of a federation

10. There is legal precedent for the duty of care being breached by the failure to use Best Available Technology (BAT) not entailing excessive economic costs even where the defendant complies fully with all environmental laws and regulations.

statutory duty. For example, there have been no grounds for natural or legal persons to sue the Brussels-Capital government for continuing to discharge Brussels' raw sewage into the river Senne. Only the Flanders government, representing the region directly harmed by this pollution, could have brought such an action.[11] In view of the serious political consequences that such an action would have had, the Flemish authorities have preferred to resolve the problem through other means. This is discussed further below.

10. These institutional arrangements, and the fact that the shape of environment policy is dictated to a significant extent by the need to implement EC directives, can limit governments' choice of policy instruments to address their environmental responsibilities. For example, a regional government cannot independently levy an environmental tax on certain products (such as cadmium batteries) to limit the generation of waste but rather must co-ordinate such a tax at the national level. This is clearly a more cumbersome and time-consuming procedure than using an instrument, such as waste disposal charges, that can be imposed independently. Similarly, governments cannot use economically efficient instruments (environmental taxes or tradable emission permit) alone to ensure that certain EC directives concerning minimum standards are met in all locations. For example, using economic instruments to reduce nitrate emissions from agricultural sources could result in emissions per hectare still exceeding the EU limit in certain areas, even though the overall reduction may be in line or greater than implied by the directive. These institutional constraints must be taken into account when considering what might constitute an economically efficient set of environmental policy instruments in Belgium.

2. Water: quality and supply

11. There is quite a variety of approaches to different aspects of the problems of water supply, quality and treatment in Belgium. As far as quality is concerned, three examples illustrate the wide variety of issues at stake. Surface water is of poor quality in many areas yet the city of Brussels, until August 2000, had no water treatment works. In Flanders, and to a much lesser extent in parts of Wallonia bordering Flanders, intensive livestock farming (mainly cattle but also pigs and poultry) is a source of pollution through production of large quantities of nitrogen-rich manure. Some reductions in the net nitrogen surplus (manure, fertiliser, atmospheric deposition minus nitrogen uptake by crops and pasture) have been achieved over the past ten years despite further manure production increases.[12] The norms of the EC directive on nitrogen from manure (itself a response to non-implementation of a 1975 directive on surface water quality) have yet to be respected. In Wallonia, tension between economic and environmental pressures has often led to a selective approach with respect to river water quality deferring to revealed consumption choices (bathing in polluted rivers) of the local population. The following sections discuss these examples in turn, and a further section looks at water supply and charging.

2.1 Water quality - Brussels

12. Until late 2000, sewage from Brussels flowed entirely untreated into the river Senne, a tributary of the Scheldt. As the OECD Environmental Performance Review for Belgium points out, water quality in

11. The Netherlands, which is also harmed by this pollution, has no grounds to sue the Brussels-Capital government as the polluted water it receives first passes through Flanders. Were the Dutch government to sue for the environmental damage caused by Brussels' raw sewage discharges, it would be obliged to bring its action against Flanders, from where the polluted water directly comes.

12. More information on this is available in OECD (2001*b*) and OECD (2001*c*).

the Senne downstream from Brussels is comparable to that of sewage (OECD, 1998).[13] This relative backwardness in treatment of household wastewater is not confined to Brussels - in the late 1990s, only 28 per cent of the population of the country as a whole was connected to a water treatment works. Construction of one sewage works for Brussels, with a capacity to treat sewage from less than 30 per cent of the inhabitants, was begun in 1994 and it came into operation in August 2000. Administrative action to deal with the problem was initiated in 1989; progress was slow and gained momentum with pressure from the EU, which in late 1999 began legal action against Brussels and the other regions, all in violation of a 1991 EC directive.[14] The construction of a second sewage treatment plant in Brussels, which would bring total capacity up to the level required to treat all Brussels' wastewater, and some from Flanders upstream of Brussels, is now planned for entry into operation in 2005.

13. With such poor water quality downstream[15] from Brussels, it might have been expected that pressure from citizens in that area would have forced action much earlier. Residents in affected areas receive no compensation. In fact, pressures from affected constituencies appear to have played at most a very minor role. This is partly because much of the downstream area is in the region of Flanders, so that electoral pressure would be only indirect; other kinds of pressure could perhaps have been exerted through the courts, but this does not seem to have happened. In principle, Belgian citizens have the right to take polluters to court, but do obviously not have the right to take a government to court for not preventing pollution. Nor is there any tradition of legal action by third parties, through which environmental action groups might have put pressure on governments.

14. The Flemish authorities were not inactive and have been pushing for action by Brussels-Capital for some time. However, they have felt it inappropriate to take legal action. There tend at any one time to be a number of issues of conflict between regional governments, and the emphasis is on finding mutually acceptable compromises, with the result that the outcome on any one issue taken alone may not appear optimal. In this case, part of the solution was a form of cost sharing between the two governments. The Flemish region is financing 12 per cent of the costs of the two water treatment works, according to a formula based on the shares of *i)* population, and *ii)* the land surface drained in the relevant parts of the river basin.[16]

2.2 Water quality - livestock in Flanders

15. One of the most important contributors to pollution of surface water in Flanders is intensive livestock rearing. Intensive livestock rearing produces large quantities of manure, from which pollutants, particularly nitrates but also phosphates, leak into surface and ground water unless absorbed by plant growth or removed. This problem also occurs in large parts of neighbouring Netherlands, and in a small part of Wallonia. In these areas, the traditional small scale family farms could only respond to competitive

13. OECD (1998) notes that the Senne in Brussels had to be entirely covered already in the early part of the 20th century.

14. Directive 271 from 1991, requiring a certain type of sewage treatment works for all towns with population over 10 000 in sensitive areas *(i.e.* areas with particularly poor surface water quality). This requirement was to be met by the end of 1998. Brussels is not the only region in violation of this directive, both Flanders and Wallonia have large numbers of such towns without suitable water treatment.

15. The river Senne is also somewhat polluted, from Flanders region, before it enters Brussels.

16. Under the formula, 5/6 of the cost is shared on the basis of population and 1/6 on the basis of land surface looks. Cost-sharing using these two parameters is the basis for a number of international agreements affecting, for example, the waters of the river Meuse (between the governments of the Netherlands, Flanders, Wallonia and France).

pressures by increasing the scale of their operations, which destroyed the balance between livestock and agricultural land, which could absorb the produced manure. The concentration of livestock - notably cattle, pigs, but also poultry - is not an outcome of a particular comparative advantage of the land. The (EU-wide) agricultural policy does not favour this sector in particularly this location, but of course provides a favourable framework especially for dairy farming. In addition, the proximity of demand provided by the most densely populated area in Europe may also have played a role, and it may also be linked with the proximity of major ports through which animal feed can be imported cheaply.

16. The consequences of such pollution - potentially harmful concentrations of nitrates in public drinking water, if this is supplied from surface water and eutrophication both of inland waters and the estuarial and coastal waters nearby - can in part be valued. Nitrates can be removed from water intended for the public water supply at a cost (though much of Belgium's public water supply is taken from groundwater, less affected in the short run by nitrates but already contaminated in some areas and likely to suffer more in the longer term), so it might be possible to link a tax on nutrient discharges to the cost of making good the resulting damage. The costs of eutrophication are both harder to evaluate and are not felt at the source, but downstream in shared or international waters.

17. An obvious way to tackle this problem would be to tax nutrient discharge to reduce its volume to a certain level. Indeed, taxes on non-agricultural waster water exist in Flanders, giving enterprises an incentive to invest in wastewater treatment, and have had a significant effect in reducing discharges from these sources. In agriculture the emphasis has been on setting rules for the manner in which manure is handled and imposing fines where manure is not disposed of as the law requires, which essentially means either transporting it to areas where less manure is produced or treating it.[17] In 1998, 61 fines worth ECU 1 million, a rather small amount in relation to the total livestock in Belgium, were imposed.[18] The expected penalty does not seem to have given sufficient incentive to reduce discharges.

18. From 2001 additional penalties have been introduced, in the form of a "super tax" on nutrient content, when manure production exceeds levels corresponding to the requirements of a 1991 EC directive (676/91). The introduction of the super tax is progressive, and by 2003, at BF 40 per kilogram of nitrogen or phosphate, will exceed the corresponding profit on raising livestock. However, taxes on nutrient use - including on the nutrient content of mineral fertiliser - when manure production is below the thresholds will be only a fraction of these levels (under BF 1 per kilo). This gives practically no incentive to reduce nutrient discharges once manure production dips below the threshold. This is unlikely to give least-cost reductions in discharge; it might be reasonable to have the tax rate a function of local levels of surface water pollution, but this does not vary by a factor of more than 40 with moderate variations in discharge.

19. Applying the full rate to all discharges would be very burdensome to farmers, hence their opposition to it in the past.[19] An alternative solution could involve a cap-and-trade scheme for discharge

17. Many other regulations affect livestock farming, including some that can affect the quantity of nutrient discharges for any given quantity of manure, for example those relating to the manner in which manure is stored.

18. Since the fine is set at EURO 1 per kilogram of nutrient, and the average annual production of manure per pig (sow) contains some 50 kgs of nutrient, this represents fines on the equivalent of 20 000 animals, about one-third of 1 per cent of the total Belgian pig population.

19. The implementation of the new action plan to limit the output of manure from cows also had to be postponed by one year until beginning of 2001 because of delayed legislation and publication of individual quotas. Farmers protested, because immediate implementation of quotas would have forced them the slaughter parts of their livestock.

permits or a uniform tax rate, with "grandfathered" permit allocations or tax credits.[20] A tax structured in such a manner could probably be set considerably lower than the "super tax" rates.

2.3 Water quality - bathing water in Wallonia

20. Environmental "capital endowments" - the two most important being the rivers and the forests - support a substantial volume of leisure activities in Wallonia. The quality required of bathing water is regulated by an EC directive from 1975 (76/160), implemented in Belgium in 1984,[21] establishing reference values for particular pollutants. Compliance with the legislation requires (along with other conditions concerning location, frequency and manner of sampling) that pollutant concentrations should not exceed the thresholds too often, generally not more than one in five samples. In the years 1989-93, the proportion of bathing zones failing to meet this standard rose to around 70 per cent[22] and was still above 50 per cent in 1996. This degree of pollution may not be surprising: in the early 1990s, less than one quarter of the population was connected to a public water treatment system, about 20 per cent were not connected to any public sewage system at all, and the remainder were connected to sewers discharging untreated water into the watercourses. The proportion connected to water treatment installations is increasing steadily, however, reaching about 28 per cent in 1997. In certain areas water is naturally acidic and contains sulphur, and in many isolated areas cess pits provide adequate natural water purification. Nevertheless, in 1996, households accounted for some two-thirds of water pollution from non-point sources, though only for about 4 per cent of total water consumption.

21. Monitoring of water quality is mainly restricted to organised bathing areas and when water quality does not meet the requirements of the EU directive the areas are normally closed for bathing. This occurs much less often in the numerous bathing areas which do not come under the heading of "organised" areas. Hence, standards set for public health reasons are often violated; furthermore it seems that although the authorities initially took samples from a wider range of areas than strictly necessary under the directive, samples in these areas - where pollutant levels were generally above the permitted levels, are no longer taken. This state of affairs may be due to a mismatch between the authority responsible for monitoring quality and that responsible for regulating access. While the Walloon water administration is responsible for monitoring, restricting access is a matter of public health, where the prerogative lies with local mayors *(Bourgmestre*s); the region notifies them routinely of the results of the sampling, and has also sent a circular letter warning of the health risks associated with bathing in polluted waters. It seems that the reluctance of local mayors to restrict access to bathing waters, even when they violate the quality standards, is due to fear of the direct consequences on local incomes from tourism and leisure, as well as the indirect consequences that might follow from a poor image.

22. In practice, it is hard to judge the seriousness of any public health problem arising in such cases, which probably arise frequently in many countries. It may be that the bathing water quality standards appear in fact too tight from the point of view of the local population in Wallonia. As mentioned earlier, the Belgian regions have generally been late in developing environmental protection policies, and frequently feel that incorporating EC directives into domestic legislation is an end in itself, reasoning that the EU Council would not set standards unless it had established that the benefits of meeting them exceeded the costs. This might result in standards being set that are not fully justified or are not sufficiently

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20. A few examples for trading nutrient pollution rights are described in Kraemer (1999), p. 94. See Hansen (1999) for a discussion of how an efficient nutrient tax could be applied.

21. The directive specifies frequencies with which concentrations of specific pollutants in water samples may exceed certain levels. The directive was supposed to be incorporated into national law by the end of 1977.

22. See *Centre d'études et de formation en écologie* (1998), pp. 47-48.

understood in a particular local context. There is not enough information to say that this is the case here since on the one hand bathers may not have sufficient information to make an informed choice - when informed of a water quality problem the local administrations do not typically advertise the fact - and on the other hand local government has no direct say in sewage treatment policy, which is a regional responsibility. However, it could also be that the local population is aware of the water pollution and therefore uses these waters for bathing with great care, for instance avoiding to drink it, while the EU standards have to assume an "uninformed" person, who does not distinguish between bathing and drinking water. Some explicit assessment of the costs and benefits of trying to apply the directive more widely is perhaps called for.

23. Whether or not the standards set in the EC directive are appropriate in this case, there does seem to be a lacuna in the combination of EU environmental targets and local health policy, revealed in a recent case in the European Court. The European Commission recently won its case on two out of three points of law, with the European Court condemning the Belgian government for non-enforcement of the bathing water directive.[23] However, on the third point, the court ruled that the directive imposed no obligation on member states to close bathing waters when the norms of the directive are violated, which is strange unless the bathing water standards were set with something other than public health in mind. Settling this inconsistency is likely to require some realigning of responsibilities; a closer look at the actual health risks being run would also seem in order, particularly since the investment in sewage treatment facilities required to meet the bathing water standards is quite large. Indeed there is no guarantee that satisfying the demands of the 1991 Water Treatment directive will result in water that meets the requirements of the bathing water directive.[24]

2.4 Water supply charging in Flanders

24. Finding an appropriate charging structure for public water supply is quite difficult. It needs to take into account high fixed costs, very low marginal costs until capacity is reached, and varying cost of treatment; moreover, consumers in countries with climates such as Belgium's may find it hard to think of water as something that has a significant marginal cost, and may object to water being treated as a marketable good at all, rather than as something to which everyone has a right. In fact, extraction of groundwater in Belgium is quite intensive and in some areas exceeds what is sustainable without major changes in the water table.

25. Trying to integrate these different considerations into a pricing system, while also ensuring that water companies are able to cover their costs, Flanders introduced a simple but innovative two-tier pricing structure in 1997. All domestic consumers receive the first 15 m^3 per capita free (apart from a connection fee and or meter rental), with a fixed volumetric price above that amount.[25] The result has been high marginal water prices, but data are not yet available to assess the size of the resulting impact on water consumption. Overall water bills for most households increased too, despite the free 15 m^3 water charges are paid into the MINA fund, which finances increasing expenditure on measures to protect water sources, cleanup of brown-field sites, and construction of water treatment facilities. It would be advisable to evaluate the effectiveness of earmarking water charges in this way regularly.

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23. A similar result emerged in respect of Brussels sewage treatment.

24. The 1991 directive requires primary treatment of sewage from all settlements of 2000 or more inhabitants. First, many settlements in Wallonie currently discharging untreated sewage directly into rivers come below this threshold and, secondly, tertiary level treatment is required to deal entirely with the bacteria that are the subject of the bathing water directive, although primary and secondary level treatment do make a contribution.

25. Private water companies supply water in Flanders, as well as in Belgium as a whole.

26. In principle this pricing formula is supposed to take account of a basic right to clean water. However, a closer analysis reveals that such a pricing structure may have disadvantages. Some calculations show that it is regressive. Since there are economies of household scale in water use, the per capita requirements of larger households are much lower than those of small households, so that the excess of actual per capita consumption over the free consumption may decline with household size. With household size itself positively correlated with income, the result is payments for water declining, on average, as incomes rise (Van Humbeck, 1998). Apart from regressivity, which will tend to arise whenever one moves from a system with implicit cross-subsidisation of a "necessity" to one where prices reflect costs (and which can be dealt with, if thought necessary, through general redistribution policies) relatively high administration costs may be a drawback with this system: appropriate records of household size, and a monitoring system to avoid fraud, must be maintained.

3. Air pollution

27. Belgium's targets on air pollution are largely determined by international agreements on acid rain and ozone precursors, as well as the Kyoto Protocol on greenhouse gases.[26] Emissions of greenhouse gases arise particularly from the steel and chemicals industries, from agriculture[27] and from transport. During the 1990s, emissions have generally fallen, though by less than in other countries (Figure 1), although CO_2 emissions have increased steadily, making the Kyoto target increasingly hard to hit.[28] Generally speaking, policy has so far focused on emission control technology, with regulations (which are the responsibility of the regions) following the Best Available Technique (BAT) approach.[29] Economic instruments are rarely employed - very little use is made of taxation, except in road transport, and none of tradable permits.

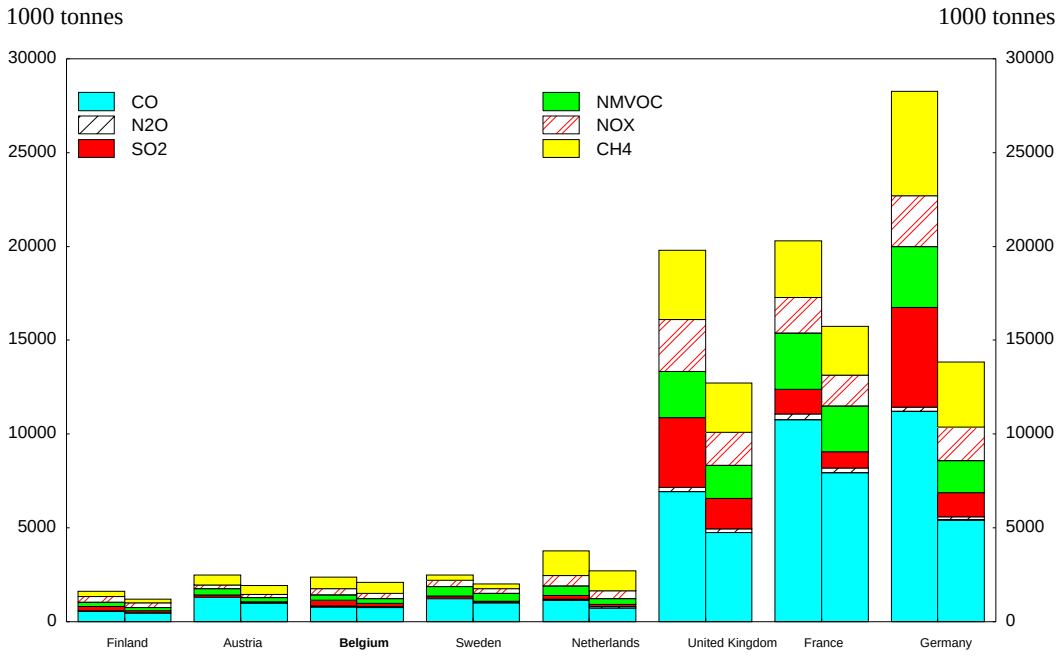
26. See OECD (1998), p. 60 for more details. The Göteborg Protocol has superseded a number of these objectives: Reduction targets for 2010, compared with 1990 are the following: SO_2, 72 per cent; NOx, 47 per cent; NH_3, 31 per cent; VOC, 56 per cent; the Kyoto greenhouse gas target (principally covering CO 2 , methane and N_2O is for a 7.5 per cent reduction over the 1990 level by 2008-12.

27. Greenhouse gas (GHG) emissions from agriculture have been rising in Belgium against the trend in other OECD countries and now occupy about 10 per cent of total Belgian gross GHG emissions.

28. And missing an earlier CO_2 target of a reduction of 5 per cent between 1990 and 2000.

29. The BAT approach consists of assessing what is thought to be the best technique for reducing a particular kind of emission in a given production process, calculated in terms of emissions per unit of output. Regulations then set this rate of emission as the standard, but leave the producer to choose what techniques actually to employ. This gives producers incentives to develop new techniques for meeting the standards, but potentially leaves different activities paying very different implicit costs for reducing emissions of particular pollutants.

Figure 1. EMISSIONS OF AIR POLLUTANTS



Note : The first column of each part refers to 1990 and the second to 1998.
Source : United Nations Framework Convention on Climate Change (UNFCCC).

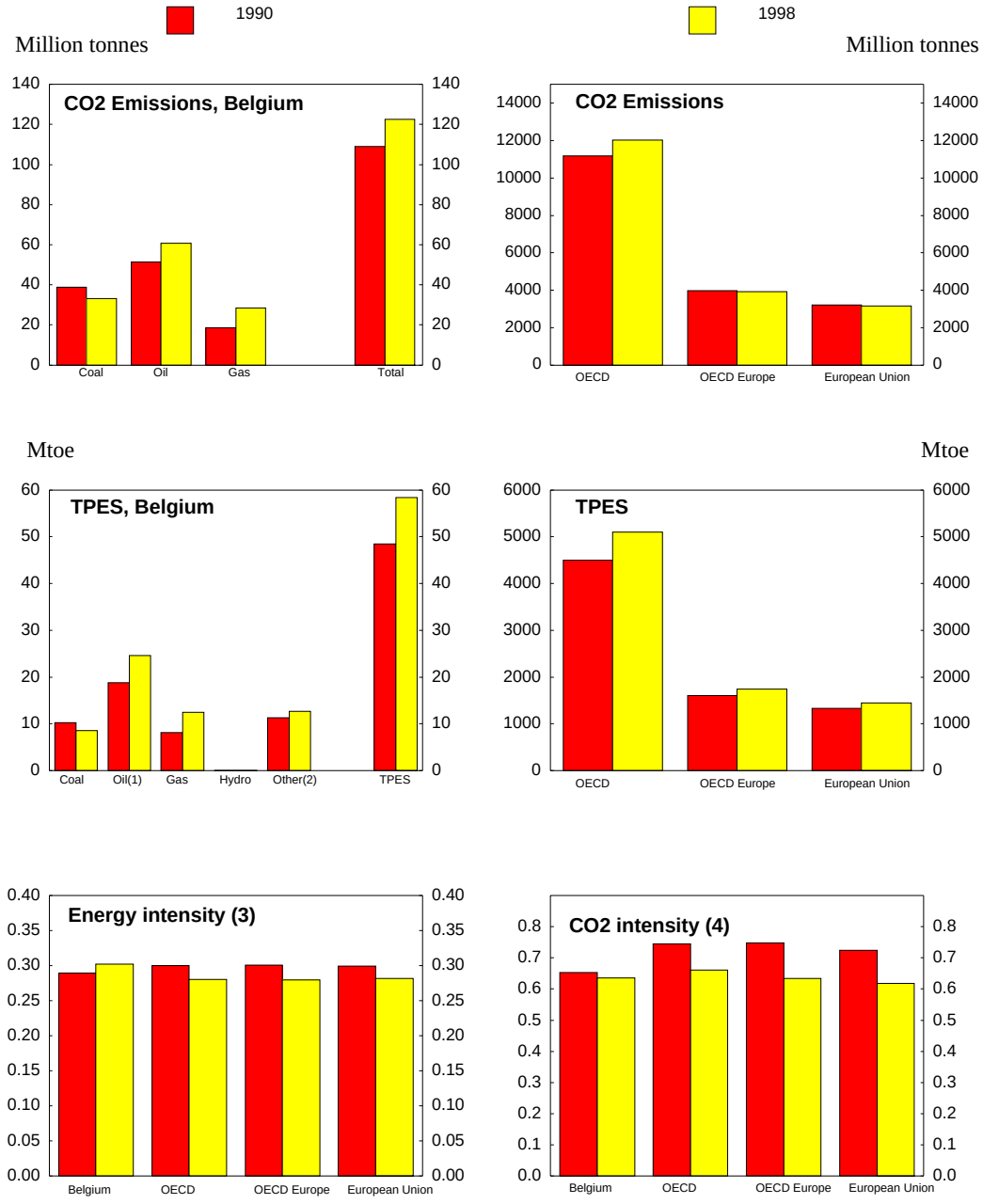
28. Belgium does have an energy tax, but it is predominantly intended to raise revenues. For an environmental measure it would be poorly targeted: fuel used by industry and for electricity generation is not subject to the tax; coal is not taxed at all (other than at a reduced VAT rate), in part to keep coal prices low for low-income households as part of a poverty reduction programme; and there is only a one-step differentiation according to, for example, the sulphur content of oil.[30] The differentiation could be extended to all fossil fuels. Generally speaking, Belgium applies some of the lowest[31] or about average[32] taxes on energy within the European Union, so it may not be surprising that energy and CO_2 intensity are tending to deteriorate relative to OECD countries overall, although they are currently around average levels (Figure 2).

30. The tax rate on heavy fuel with sulphur content below 1 per cent is BF 250 per ton, while the rate for heavy oil with sulphur content above 1 per cent is BF 750 per ton.

31. This is particularly true for heating oil of various grades.

32. In the case of petrol, Belgium applies tax levels, which are below the levels of its neighbours with the exception of Luxembourg, but considerably higher than in South European EU member states.

Figure 2. CO2 EMISSIONS AND PRIMARY ENERGY SUPPLY



1. Crude oil+NLG+refinery feedstocks+petroleum products.
2. Combustible renewable,waste,electricity and nuclear.
3. TPES divided by GDP (1990 prices using 1990 US$ PPPs).
4. CO2 emissions divided by GDP (1990 prices using 1990 US$ PPPs).
Source : IEA, Energy balances of OECD countries and CO2 emissions from fuel combustion.

29. Since just over 40 per cent of Belgian energy consumption is already supplied from nuclear generated electricity or from natural gas, neither of which contribute very much to air pollution, the adjustment necessary to meet the reduction targets of the Göteborg and Kyoto protocols will be relatively costly. Therefore, potential gains from using economic instruments to enforce a cost effective emission reduction would be significant. With obvious, cheap measures unavailable, further reductions of greenhouse gas emissions will require careful investigations done by those that either benefit from reductions or suffer from increased emissions. In other words, the more difficult the emission reductions are, the more individual compliance will be necessary and the less applicable administrative solutions will be. The Energy Ministry projects that emissions of energy-related greenhouse gases will exceed the target level by over 25 per cent in 2010. In late 2000 it estimated that a CO_2 tax of BF 820 (about EURO 20), in 1990 prices, per tonne would be necessary to achieve the target.[33]

30. Up to now, concern over competitiveness has been used to justify the exemptions in the energy tax and Belgium argues, as do most EU members, that action is needed at the level of the EU before significant national measures can be taken (Box 1). The examples of Denmark - which has a sulphur tax, a general energy tax and a CO_2 tax (albeit with significant exemptions or reductions for industry in the latter two cases[34]) - and Sweden's NOx emission charge show, however, that the constraints facing small EU member countries do not prevent action. For the moment, although the Belgian authorities accept the targets of the Göteborg and Kyoto protocols,[35] few concrete measures to pursue them have yet been implemented, though the government is considering a number of measures including a CO_2 tax (see the discussion of the Federal Plan for Sustainable Development below). Specifically, some expansion of renewable electricity is planned (Box 2). Belgium is, thus, almost certain to be a net purchaser of GHG emissions "permits" in the first commitment period (2008-12) of the Kyoto Protocol and will need to consider whether to finance these purchases through general taxation or, more efficiently, through a carbon tax or by linking a domestic cap-and-trade system to the international market expected to develop. If nuclear power stations are phased out as planned, Belgium's target will be even more difficult to meet in subsequent commitment periods, and the importance of implementing the most economically efficient policies will become correspondingly greater.[36]

33. Before the recent oil price rises, the estimate was BF 1 800.

34. See OECD (2000*b*). This report criticised the extent to which the Danish system was distorted (from the environmental point of view) for "competitiveness" reasons and argued that there were more efficient ways to deal with some of the competitiveness fears. Nevertheless, the Danish model does provide definite incentives to reduce emissions.

35. Some industry groups feel that the Belgian negotiators did not argue strongly enough for easier targets.

36. A decision has been made to phase out nuclear power stations, which currently provide around 60 per cent of Belgium's electricity and about 20 per cent of total energy supply. Replacing this with gas-generated electricity would increase national CO_2 emissions by as much as 20 per cent. However, the phase-out, based on allowing a 40-year operating life, will occur between 2015 and 2025, a period for which negotiations over emission allowances are unlikely to begin for some time.

Box 1. **Competitiveness: a valid reason for avoiding a CO_2 tax?**

Competitiveness concerns have influenced the design of a CO_2 tax wherever it has been introduced *(e.g.* the Nordic countries and Germany). Energy-intensive industries have generally been either exempted or subject to reduced rates (in the Danish system there are four different tax rates, see OECD, 2000*c*). The main reason is that energy intensive industry is frequently particularly exposed to international competition so that substantial increases in costs could result in the relocation of export, or import competing, industries; furthermore, there may be resulting increases in CO_2 emissions abroad ("leakage") offsetting the domestic reduction.

However, the policy target in this area is largely defined by the Kyoto Protocol (and the subsequent burden sharing agreement within the European Union), which provides for a reduction of 7.5 per cent in Belgian emissions of greenhouse gases by 2008-12, compared with 1990. Even if emissions "leak" abroad (and in a narrow sense this would not matter, since it is still a way for Belgium to meet its target), few of them would be likely to leak further than neighbouring EU countries and in practice very little such movement would occur since all of them are also subject to Kyoto limits and so will sooner or later have to take domestic action themselves. Action taken to cushion carbon intensive industry from adjustment increases the burden on other sectors and, for any given reduction in Belgian emissions, will in fact result in higher overall output and employment losses. This is not to deny that there will be employment losses (whose duration will depend on the flexibility of labour markets), as well as some permanent output losses; however, these effects (and their regional aspects) should be dealt with in the same manner as with other structural changes in the economy.

For Belgium, as a small and open* country with a large share of heavy emitters acting under uncertainty as to what its neighbours will do, there are nevertheless real concerns that some enterprises, if hit with a full CO_2 tax could be bankrupted or move abroad unnecessarily, in the sense that once other countries have acted the enterprise would be viable. It is therefore necessary to address the tension between the legitimate interests of workers and investors in emitting companies and the need to provide incentives reducing emissions for all actors. The best way to deal with this problem is to ensure that all activities face the same marginal incentive to abate, taking temporary measures to compensate for the potential impact on profits and international competitiveness. Such measures could be in the form of tax credits related to past emissions in the case of a CO_2 tax or in the form of grandfathering of emission permits in a cap-and-trade system. The latter approach was used, for example, in the US sulphur trading scheme (OECD, 2000*d*) and the former forms part of the recently proposed extension of the "*taxe générale sur les activités polluante*s" in France to the carbon content of intermediate energy consumption.

Two advantages of introducing a domestic trading scheme are: *i)* that it matches more closely the nature of the quantitative target, allowing the price of carbon to be determined endogenously, and *ii)* that it prepares the ground for a direct link with the international trading scheme that should emerge if the provisions of the Kyoto Protocol are implemented successfully. Whether a tax or a cap-and-trade approach is adopted for CO_2 in Belgium, measures to reduce methane emissions, which arise largely from agriculture, and for which it is not immediately clear how to adopt either of these economic instruments, should reduce the required reduction in CO_2 and, therefore, the overall cost of meeting the target (see J.-M. Burniaux, 2000).

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* The degree of openness of the Belgian economy is for instance twice as large as for Denmark if measured by the ratio of foreign trade (average of exports and imports) over GDP

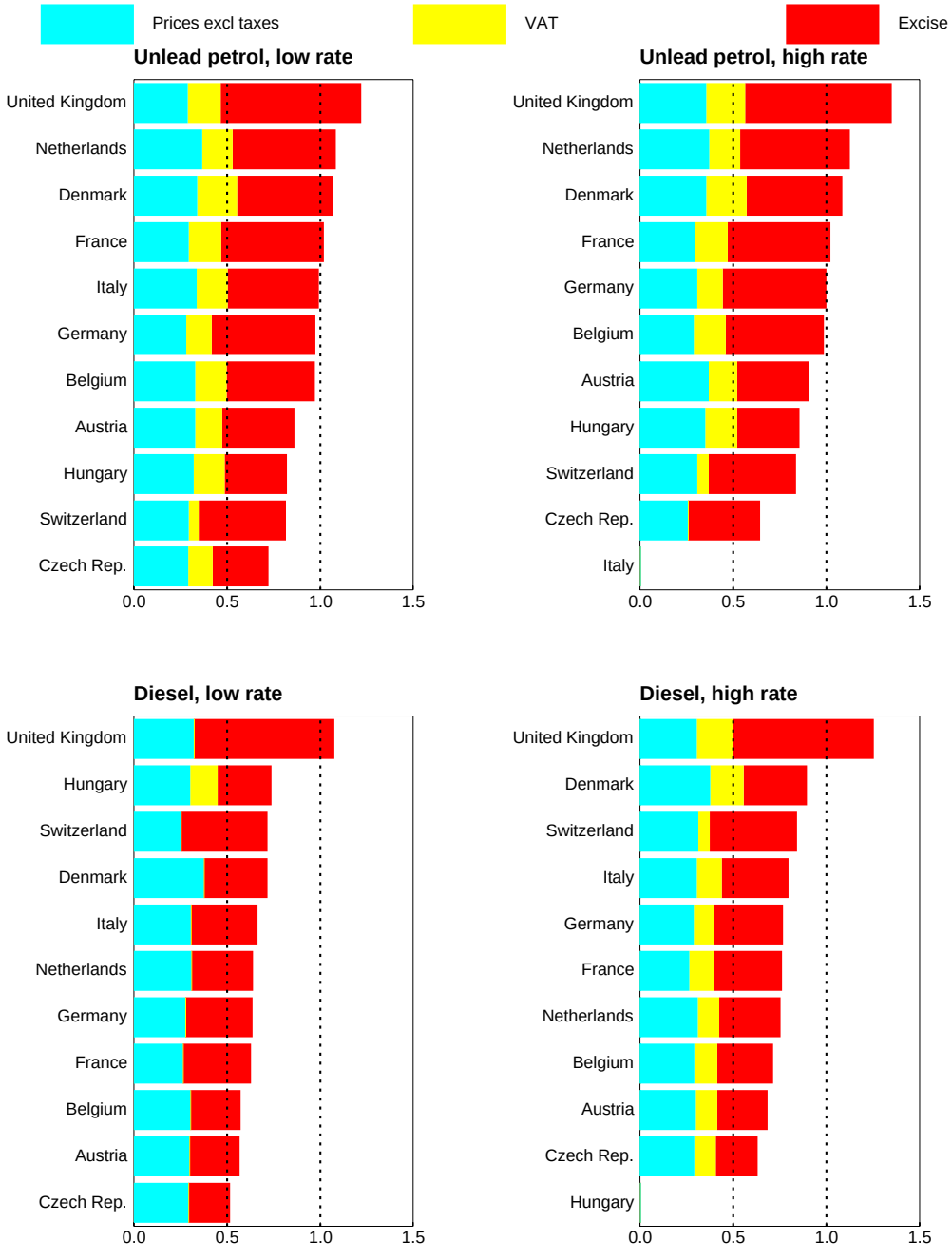
31. The importance of taking definite action soon is underlined by the way in which the earlier target for the year 2000 failed. The 1994 National Programme for Reducing CO_2 emissions (NPRE) entailed a number of measures estimated to reduce CO_2 emission in 2000 by an amount equivalent to about 12 per cent of the 1990 level of CO_2 emission. Combined with underlying growth in CO_2 emissions the programme was expected to result in about half of the target reduction in CO_2 emissions. In fact, as mentioned earlier, emissions have risen. Although the authorities are reluctant to impose taxes for fear of damaging competitiveness, other methods are not always any more popular: under the NPRE, new building codes were introduced to enhance thermal efficiency in space heating, but 80 per cent of all new buildings fail to comply with the new regulation.[37] It seems likely that the Belgian authorities have feared to overburden the population and taxpayers with the enforcement of too many objectives at the same time when budget consolidation and achievement of the Maastricht criteria was the dominant objective.

32. One area where constraints on small countries may be particularly strong is in the taxation of motor fuel. The Belgian authorities believe that fuel prices in Belgium cannot exceed those in neighbouring countries by more than very small amounts - the short distance to a neighbouring country could lead to "gasoline" tourism - that is, Belgians travelling abroad to purchase cheaper fuels.[38] This is a particular concern for diesel fuels as modern long-distance haulage trucks have very long no-refuelling travelling capacity, thus enabling them to take advantage of price discrepancies along their international routes. In the first half of 2000, duties and prices of both petrol and diesel fuel were actually somewhat lower in Belgium than in Belgium's major neighbours (Figure 3). Luxembourg is an exception - with very low fuel taxes - there are practically no petrol stations for some considerable distance outside Luxembourg's borders.

37. UNFCCC (2000).

38. However, as the level of "gasoline-tourism is a function of the distance travelled and the fuel price differential a certain spread between Belgian prices and those of other countries can still be maintained without loss in tax revenues. This spread is estimated to be around a couple of Belgian francs. In comparison, Belgian fuel prices tend to be below those of other countries, so the existing room for manoeuvre is not at present being exploited.

Figure 3. PRICES AND TAXES ON TRANSPORTATION FUELS
Q2 2000 or latest available, US $



Source : IEA, Energy prices and taxes.

33. In setting taxes with the aim of reducing emissions, it should be noted that both driving conditions and the type of vehicle being driven affect emissions (Figure 4). The increase in the cost of emissions per litre in congested urban driving,[39] especially for diesel, also justifies concentration on reducing this kind of vehicle use more than inter-urban and rural traffic in general. It is therefore clear that the differential between tax on diesel fuel and on petrol is not justified in environmental terms - if anything, the tax on diesel should be higher than that on petrol.[40]

34. It is also clear that the change in emission standards on new vehicles since the late 1980s has dramatically reduced the levels of pollution, per volume of fuel consumed, from new cars in Europe, following a similar improvement in the United States, where catalytic converters were made compulsory earlier. This was of course almost entirely attributable to "command and control" policies at the European level and it seems likely that the benefits substantially exceeded the costs, though the authors are not aware of a published study.

Box 2. **Renewable energy in Belgium**

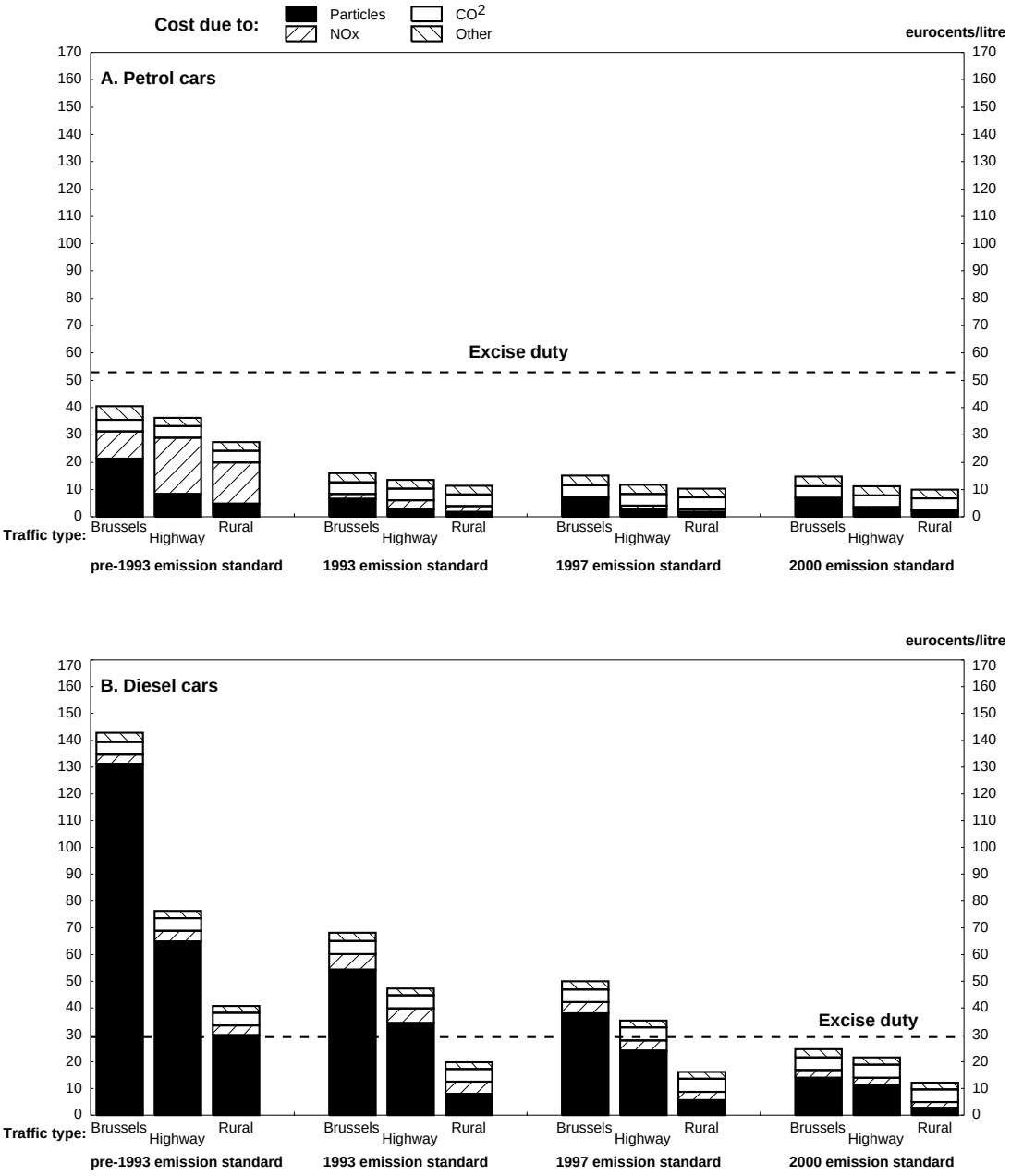
Renewable energy (generated from a non-depleting source) accounts for only 1 per cent of total energy supply in Belgium as compared with 6 per cent for the OECD area. Belgian renewable energy supply is predominately generated by Combined Heating and Power (CHP) plants within the industry sector using biomass or waste as energy sources. The policy developments in this area are primarily the planned construction of federally owned offshore wind-turbine parks to take advantage of the good wind conditions in coastal waters and the introduction of a 3 per cent target for the share of renewable energy in the electricity supply by 2004. The target is envisaged to be enforced by introducing a system of "green" certificates, to be issued by the generators using renewable energy and to be purchased by distributors along with the electricity generated by renewable energy. Distributors who do not possess enough certificates in proportion to the electricity they supply will face fines. To further stimulate the use of renewable energy, investment projects in this area enjoy a special 10 per cent tax deduction and a production subsidy of BF 1 per kWh as well as support through programmes at regional level for promoting renewable energy. Moreover, the impending reform of the electricity market will grant privileged grid access and guaranteed minimum prices to CHPs. Although the 3 per cent target is itself somewhat arbitrary, using a system of green certificates is an effective way to implement it especially if a secondary market is permitted. A similar system has already been introduced in Denmark,* though with a higher target in line with its greater wind-power potential.

* OECD (2000*b*).

39. Due largely to particles and NOx emissions themselves are somewhat greater in congested conditions, but the cost of any given quantity of emissions is also much higher in urban areas because of the higher population density.

40. There is therefore also no reason why taxes on diesel should be reduced to compensate overall crude oil price increases, as has been demanded in the course of truck drivers and operators protests.

Figure 4. Air pollution externalities due to motor car fuels, Belgium



Note: The figures are based on estimates of emissions under certain typical driving conditions, Brussels: urban centre of a large city; highway: highway in a rural location ;rural: a Flemish village and certain types of car, corresponding to successive European emission standards, for new cars: pre-1993; 1993 (directive 91/441/EEC),1997 (directive 94/12/EC), 2000 (directive 98/69/EC).

Source: Leo De Nocker, Luc Int Panis, Rudi Torfs: "Environmental damages from transport in Belgium: trends and comparison with excises on petrol and diesel." Contribution of the Flemish Institute for Technological Research (VITO) to EU report, DGXII (2000)"External costs of Transport, Final Report, Office for Official Publications of the European Communities, Luxembourg.

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35. Although taxes on fuel for transport are not particularly high in European terms, a number of exemptions and special tax allowances are in place, leading to a tax system that favours polluting fuels in the transport sector. Commuting expenses can be deducted at a rate of BF 6 per kilometre. This is a generous deduction: note that the excise tax on fuel amounts roughly to between BF 1 and BF 2 per kilometre for cars consuming between five and ten litres per 100 kilometres, so some taxpayers, depending on their marginal rate of income tax, may have a refund that exceeds the excise tax. This certainly weakens incentives for using environmentally friendly transport modes. The latter is to a small degree offset by the tax exemption of employer financed commuting with public transportation. Furthermore, personal income taxes are incurred on company cars by imputing at least 5 000 km per year to private use. The income equivalent per kilometre is dependent on the engine power of the car, which could not only be seen as an implicit progressivity, but also satisfying some environmental differentiation.

36. Public transport is to a large extent exempted from taxes on energy,[41] reducing incentives for environmentally friendly optimisation of public transport. Public rail transport operated by the central government pay no taxes on energy, while public bus transport operated by regional governments is subjected to excise duty, but is reimbursed BF 2 per litre of diesel. In both cases, the environmental costs of operating public transportation are at most only partially reflected in the private costs facing the operators. This is of a particular concern on low-density routes and outside rush hours as public transportation only emits less CO_2 per passenger at relative high occupancy rates.[42] An affirmative action program for public transport (as described in the following paragraphs) does not exclude an enforcement of choices in transport modes that minimise the emissions given a certain volume of transport services.

4. Congestion in Brussels

37. Brussels City suffers particularly from urban congestion and pollution and faces difficulties in dealing with them, difficulties that may be accentuated by the structure of government. A lot of traffic in Brussels city is due to the increasing number of commuters travelling in from the surrounding areas (mostly in Flanders), many of whom have migrated outwards from more central locations in search of (among other things) a cleaner and quieter environment. The Brussels-capital authorities have developed a "mobility plan" which incorporates a wide range of aims and projects for achieving them (Flanders and Wallonia also have mobility plans, but there is no national one, although it is intended to introduce one in 2002). One strategy incorporated in the plan to encourage a move towards mass transit for commuters is to improve the railway system. The intention is to develop a regional express commuting network,[43] largely by improving existing lines. Another possibility, under consideration but not included in the plan, is to use road pricing.

38. As far as the railway system is concerned, even if there are overall gains from improvements, which will probably require both investment and operating subsidies,[44] the structure of government may make it difficult for those who have to pay the subsidies to capture the benefits, even indirectly; furthermore, significant success in improving access to Brussels by train may further encourage the movement of population out of Brussels, accentuating the problem. Urban planning policy could also

41. Agriculture is also fully exempted from fuel taxes.

42. The social cost of providing public transportation is only to a small degree revealed in the direct cost of using public transportation as revenue from ticket sale only cover about one-third of total costs.

43. Referred to as the RER *(réseau express régiona*l), similar in inspiration to the system with the same name serving Paris and its suburbs.

44. It is intended mainly to use and upgrade existing lines and stations, with a small amount of new construction.

contribute, encouraging new building in the Brussels hinterland to be directed towards areas that already have good rail access, so as to reduce the proportion of people commuting by car. Such policies can at best act very slowly, and thus need to be maintained consistently over a long period of time. Removing the ability of commuters to deduct BF 6 per kilometre travelled to work against their income tax would also remove an incentive to commute longer distances and might also reduce prices of more remote land reflecting its deteriorated location after increased commuting costs are taken into account.

39. Important parts of the Brussels hinterland are not simply outside the city, but are in Flanders, outside the Brussels-capital region. Transfers of local taxation between two different regions would be difficult to agree and implement, and co-ordination of planning policy (which is a regional not a national competence) might also be difficult.

40. Such governance problems should not prejudice the utilisation of road pricing in Brussels, which might be a means of limiting commuting from outside Brussels. An idea currently under consideration is limiting access to the area inside the ring-road, which can be conveniently restricted because of the limited number of access points. Very few such schemes operate in OECD countries; Oslo and Bergen in Norway are examples (OECD 1999, p. 112), which seem to be more used for raising funds for infrastructure than for reducing congestion or pollution. Advances in technology should mean that more ambitious models such as charging for road use directly rather than just for access could be implemented in the near future. One of the reasons delaying a decision on what kind of scheme to implement appears to be that technology is advancing so rapidly that there is a fear of choosing a system that will become obsolete very quickly.

41. A scheme to reduce road access to Brussels, or to charge for road use within Brussels, would certainly face opposition from existing commuters and residents.[45] Reducing road use by limiting inside-ring-road access for commuters would probably be easier to implement than more precise road pricing, both politically and technologically; but congestion and air pollution might not diminish by as much as expected - road use by residents would increase to fill some of the gap left by excluded "outsiders". For a restricted access scheme, the level of charges might ideally be equal to the estimated cost of the expected amount of pollution and congestion that would be generated by the marginal car journey, and could thus be a function of the time of travel, for example (as it is in Oslo and Bergen in Norway). However, it could be argued that some of these costs are already accounted for in fuel taxation - there would be no clear-cut "correct" level for such a charge. Traffic modelling[46] and careful cost-benefit analysis - probably including an assessment of who benefits and who incurs the costs - will be necessary in designing any system.[47]

5. Environmental taxes - "ecotaxes"

42. Belgium is cautiously adopting a shift from a regulatory administrative bias of environmental instruments towards more application or at least discussion of economic instruments, particularly taxes on environmentally damaging consumption or production activities. A more comprehensive description of

45. Restricting access would clearly favour residents, whereas both commuters and residents would in principle face the same prices under a road-pricing scheme.

46. van Calthorp *et al.* (2000) use simulations of an urban transport model to argue for a combination of taxing car parking opportunities (in the inner cities) and access to the inner city area. Their results suggest that both measures have to be considered together and that road pricing might not deliver large additional welfare gains, once free parking opportunities in inner cities have been eliminated.

47. van Calthrop-Proost (1998) argue that the role of government is crucial not only in terms of being able to compensate the externalities of urban traffic but also in terms of marketing the public support for an optimal institutional road pricing design.

environmental policy instruments in Belgium in general and Flanders in particular has been provided by Deketelaere (1999). The following paragraphs describe the use of "ecotaxes" together with some selective features of the state of application of more direct economic instruments in Belgium.

43. Belgium has taxes on a small number of specific products - batteries, disposable containers, disposable razors (introduced but subsequently withdrawn), disposable cameras - that were imposed with environmental goals in mind. They were part of the 1993 "ecotax" legislation. Since this legislation was part of a package of measures agreed upon in order to secure consent to major constitutional changes by a number of political parties, they were not well designed, suffering from a number of defects, most of which are recognised by the federal authorities. A commission was established almost immediately to redesign the taxes, some but not all of which have subsequently been implemented.[48]

44. A striking aspect of two of the ecotaxes - those on batteries and on disposable cameras - is that they resemble command and control as much as an economic instrument approach. Rather than assessing the external cost imposed by the use (and disposal) of, say, a battery, and imposing a tax related to that cost, the taxes were set at levels thought sufficient to induce very big changes in behaviour. In parallel, arrangements were introduced whereby producers or distributors are exempted from the tax, provided they provide facilities for collecting and recycling the product.

45. These high tax rates[49] have had beneficial effects for the environment, with use of the taxed goods declining substantially. The tax on disposable razors was so "successful" that sales fell to zero, which is certainly not justified in terms of avoided environmental damage. While certain products are being taxed as if they are highly dangerous, many other products are not taxed at all. The pesticide tax, another tax introduced under the ecotax legislation, has a more rational structure, with different kinds of pesticide being taxed according to the "active ingredient" content; by contrast, the exemption of the major user of pesticides, agriculture, seems irrational from an environmental point of view.[50] The taxes on paper and packaging, which are by weight or by volume, with few exemptions, make more sense although, as with the other ecotaxes, it is not clear whether there is a relation between the environment cost and the tax rate.

46. This approach departs from the theoretical ideal - in which all activities and sectors face the same incentives to reduce particular types of pollution, with that incentive equal to the marginal social cost of the pollution in question. With such a departure, high abatement costs are incurred in some areas and none in others, so that it is possible for overall welfare to be reduced, despite environmental gains.[51] In practice, keeping close to the ideal is difficult, for lack of information as well as for practical reasons such as the

48. Some could not be implemented at all in the form legislated: a tax on paper was intended to be a function of the proportion of recycled paper contained in the product: there is no known way to measure this in the final product. Those implemented so far are on batteries, single-use cameras and some industrial packaging items. A tax on disposable razors was introduced but later removed.

49. The tax on batteries is at a flat rate of BF 20 (about EURO 0.5) per battery, regardless of its size. This amounts to as much as 50 per cent on small batteries. On single-use cameras (and razors) the tax rate is (was) as much as 100 per cent.

50. This is irrationality shared with a number of other taxes (notably those on fuels, where agriculture, air and sea transport is exempted) and a large number of other countries. Information on environmental taxes and charges, rates and exemptions, for OECD countries can be found in a new database on environmental taxes: *www.oecd.org/env/policies/taxes/index.htm.*

51. This seems to have been the case for the tax on disposable razors mentioned earlier. After sales fell to zero, the tax was removed. The follow-up commission on ecotaxes could not find a significant difference between the environmental damage of the taxed razor and other razors. Presumably it was felt that the value of these products exceeded their environmental cost after all, despite their apparent wastefulness.

lack of a suitable tax base, or the difficulty of enforcing ecotaxes also on imported goods, whose technical specification and environmental sensitivity could not be monitored in the same way as for domestically produced goods.

47. Revenues from the ecotaxes are low - in fact they are thought to be lower than the costs of collecting them (net revenue from ecotaxes are to be passed to the regional governments, even though they are federal taxes).[52] This is not in itself evidence that they are particularly inefficient - since their purpose is to induce reuse or recycling which attracts exemptions from the taxes. The taxes should be evaluated according to whether the resulting environmental benefits justify the costs incurred in setting up and running the schemes and any losses in consumer surplus from induced changes in consumption patterns. While tax collection costs are part of this, their size in relation to tax revenues are irrelevant concerning the intentions of an ecotax, unlike in the case of taxes whose main purpose is to raise revenue. A revision of the ecotaxes, possibly including an extension of their scope, is intended for 2001.

5.1 Policy formation: plans for sustainable development

48. As mentioned earlier, all three regions and the federal government have plans for promoting the environment and sustainable development. The federal plan, which follows the regional ones, has developed in an interesting way. A first plan was approved in July 2000, following a first federal report on existing sustainable development policies published in 1999. Subsequently, the government is required to report on progress in meeting the targets every year; a revised plan is to be produced every four years. The plan (Box 3) itself will have the status of a government programme rather than a law, *i.e.* a new government will not be required to follow the plan of the previous one; however, it will be required, unless the 1997 law is modified, to formulate and follow its own sustainable development plan in the same fashion.

49. A draft plan[53] was drawn up by the federal planning office and published in early 2000 for public consultation and comment, after which it was revised in the light of the comments and interministerial discussions and agreed by the cabinet in July. Also instituted by the 1997 law was a Council for Sustainable Development, consisting of representatives from the social partners and academia, and an Inter-departmental Commission for Sustainable Development. While the former is to function as a watchdog on policy development and implementation, the latter defines the policy areas which the sustainable development plan should cover and was responsible for the final version of the draft plan.

50. The published plan,[54] drawing its inspiration from the Brundtland Report and the Agenda 21 Report from the 1992 Rio de Janeiro conference, has a very broad coverage, from poverty and social exclusion (both domestically and abroad) to the environment. But, as far as the environment is concerned, its coverage is only partial, reflecting the fact that many areas of environmental policy are the responsibility of the regions, not the federal government. It thus deals with air pollution and energy, for example, but not water pollution or waste disposal. Furthermore, it is mainly devoted to general concepts and arguments, and discussing aims in qualitative terms, rather than making quantitative assessments of priorities and targets. In some cases, specific quantitative targets are given, for example for reductions in overall energy use; although this might be the eventual outcome of policies to reduce GHG and other emissions, it would be a mistake to make it the central plank of policy, which should be focused on the

52. Under the constitution, only the federal government has the power to impose product taxes. The regions can impose taxes on pollution.

53. "Avant-projet de Plan fédérale pour un développement durable, 2000-2003."

54. "*Plan fédéral de dével oppement durable*, 2000-2004".

relevant emissions themselves not on energy use - thus, an efficient instrument for reducing energy use would be an undifferentiated energy tax, whereas what is needed is a set of taxes whose effect is precisely to tax different kinds of energy at *different* rates reflecting their contribution to pollution - an undifferentiated tax, led by an inappropriately expressed target, would be a costly way to meet the targets of the protocols.[55]

Box 3. **The Federal Plan for Sustainable Development**

Following public consultations on a draft issued in the Spring, the federal government's Plan for 2000-04 was approved by the Council of Ministers in late July (and published in October 2000). For the most part it is an announcement of intentions and objectives - although more than 600 specific actions are suggested - in a variety of areas.* Some of them require consultation and co-ordination with the regional governments.

The Plan presents a wide-ranging and often ambitious set of targets, placing much emphasis on programmes to raise public awareness of all the problems covered. This should indeed help to develop the public support necessary to succeed in agreeing and implementing effective policies.

The Plan argues for the need to internalise the environmental costs of polluting activities, particularly in the context of transport, but does not make a specific commitment to extend the use of taxation, or the use of tradable emission permits, with the exception of the intention to introduce an energy and CO_2 tax, preferably under a European-wide policy, which is intended to be launched under the Belgian presidency of the EU in the second half of 2001; but in the absence of agreement on a European tax, the possibilities for unilateral action will be investigated. The possibility of exceptions or exemptions for heavy energy users and the protection of vulnerable social groups are strongly emphasised.

The importance of economic incentives is nevertheless clearly recognised in the Plan, and in many areas policy appears likely to proceed through subsidising cleaner modes of production, rather than taxing polluting activities. Thus, a target for production of renewable energy** is likely to be promoted by subsidy and by imposition of quotas, though the possibility of using a system of tradable green certificates seems to be foreseen in parallel. Action to use economic instruments in another area covered in this *Survey*, the problem of water pollution by agriculture, particularly intensive animal husbandry, is not mentioned in the federal plan, since it is a regional competency.

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* The list of main chapter headings covering the objectives of the Plan is as follows: *Actions modes de consommation - production* (changing consumption and production patters); *actions pauvreté et exclusion sociale - surendettement - santé environnementale* (action on poverty and social exclusion - over - indebtedness - environmental health); *actions agriculture - milieu marin - diversité biologique* (agriculture - the marine environment - biodiversity); *actions énergi - transports - ozone et changements climatiques* (action on energy - transport - ozone and climate change).

** It is intended to reach agreement with the Regions, by the end of 2001, on promoting a target that 2 per cent of total energy consumption be from renewable sources by 2010; by 2004, 3 per cent of electricity should be from such sources.

55. It seems in the case of the Kyoto Protocol, that the draft plan has adopted the "Assigned Amount" (as adjusted under the EU burden-sharing scheme) as the domestic target for GHG emissions, implying that Belgium probably would not undertake any net trade in emission allowances. In fact, Belgium probably has relatively high abatement amount, making up the difference by purchasing permits from other countries. At least this is true for CO_2 emissions. Belgium probably has relatively high emissions of nitrous oxide and methane, which could be reduced at relatively low cost. See J-M Burniaux (2000).

51. The short-run usefulness of the sustainable development plan, as far as environmental issues taken on their own are concerned, can be questioned. Although co-ordination is important in principle to ensure that different sectoral policies, for instance, do not give contradictory incentives, many environmental policies in Belgium at the moment are motivated by implementing European directives where such co-ordination may be largely irrelevant. Of greater value may be the institutionalisation of a process whereby plans and intentions are regularly confronted with outcomes: one suggestion is that, following the production of the yearly reports on progress, ministers should each be required to issue a statement justifying any shortfall in outcomes compared with targets. Depending on the format of such a statement, it might be a way of aligning ministerial incentives better with environmental aims.

52. Another way of giving incentives to make progress in environmental policy might be a greater use of cost-benefit analysis. Although sometimes perceived as a way of avoiding action on environmental issues, valuing the benefits and costs of action could help to align incentives better. One problem is the difficulty of valuing many of the targets of environmental policy, notably concerning "existence" and "option" values of certain resources, and the value of human lives. However, there is a rapidly growing literature, with sign of convergence of views on appropriate procedures in many areas. Of course, disagreements and uncertainties will persist, especially in a subject in which a lot depends in quantifying subjective valuations. Nevertheless, the example mentioned earlier on petrol versus diesel emissions in motor cars (where the value of lives lost or damaged through pollution or accidents is a major part of the cost-benefit analysis) shows that, even where there is uncertainty on valuation it is pretty clear that the tax on diesel is out of line with that on petrol as far as environmental consequences are concerned. This remains true even if there is room for argument about at what level the taxes should actually be.[56] Similarly, even if it may be difficult to agree on the value of a human life, assessing the cost per life saved under different legislation *(e.g.* health and safety, air pollution) can throw interesting light on the balance of resource use.[57]

53. Although it has yet to be employed systematically in any of the Belgian ministries of environment, an increasing amount of environmental cost-benefit analysis is carried out in Belgium, much of which is associated with an EU programme. The analysis of transport externalities discussed above is based on data developed under this programme. Reports of the Social-Economic Council of Flanders increasingly make use of cost-benefit analysis, more than in other regions.

6. Conclusions and recommendations

54. Two of the most important goals of Belgian environmental policy are inevitably to catch up with EC directives, particularly in the area of water treatment, and fulfilling the international commitments concerning the reduction of green-house gas emissions. In both cases, incentives for environmentally compatible behaviour of consumers and producers have to be enforced, preferably through economic instruments. Current environmental problems are related to economic activities, which do not take

56. There seems to be a common view that diesel fuel should be taxed less because diesel engines are more economical. This does not make sense, except perhaps to the extent that environmental damage is a function of distance travelled rather than fuel consumed. This is true for accidents, but no for pollution costs. A plan in 1996 to increase the tax on diesel fuel was shelved through lack of agreement with neighbouring countries. An additional tax on diesel cars was introduced instead.

57. See, for example, OECD (1992), pp. 150-151, reporting analysis showing that some safety programmes cost tens of millions of dollars per life saved, whereas others cost only hundreds or thousands. See OECD (2000*c*) for further discussion of this.

sufficient account of negative externalities. Changing this will inevitably demand a different behavioural pattern of households and firms, which will also necessarily demand either higher costs or increased productivity, but should be rewarded by additional welfare. This should become clear from the examples described in this paper and summarised below.

55. As concerns Brussels sewage, domestic processes produced slow progress and prompted EU pressure, which culminated in recent European Court judgements against the Belgian authorities. Downstream residents have been suffering uncompensated for many years, with no effective legal recourse. The bathing water in Wallonia raises issues of a similar character. Either bathing in the water is a genuine health risk. In this case it would seem that the *bourgmestres* are systematically failing in their duty, and they ought to be open to legal action so that they in turn have an incentive either to build the treatment plants or take action against polluters. Or the water standards are too strict in the sense that (local) bathers are willing to run much larger risks than the (EC Directive) standards assume. In this case one should consider providing the local population, administration and policy makers with better information about the motivation of these particular standards. Development of processes for using the legal system to sue for damages, and for non-interested parties to take public authorities to court for failing in their duties, might help under such circumstances to establish where the truth lies in both of these cases. Careful provision for ruling out capricious use of the courts might need to be included. Some changes in the legal system have been made: a change in the liability regime in Flanders provides for strict liability in the case of soil contamination, replacing the no-fault approach in federal law; a 1993 federal law allows non-governmental organisations to take action against government for non-enforcement of regulations. Without increasing pressure from this direction, it is likely that Belgium will always lag in implementation of EU regulations.

56. In the case of water supply, the Flemish approach to pricing appears quite efficient. It combines a high marginal price, giving an incentive to economise, with a very low or zero price for initial quantities thus satisfying the notion of a "right" to a minimum quantity of water, and may be one that could usefully be adopted by other countries where opposition to the idea of paying for basic water rights is strong. Although its distributional properties may not be entirely fair, it seems better than many alternatives, provided that administrative costs of preventing fraud can be kept low. Wallonia is planning a similar approach, while Brussels has opted for a uniform volumetric charge with a social fund for those having difficulty paying their water bills.

57. As far as traffic problems are concerned, it may be that the room for manoeuvre is not too large for fuel tax as far as congestion and pollution is concerned. However, it is clear that environmental considerations alone strongly imply that a re-balancing of the tax on petrol versus that on diesel is needed, and with taxes in Belgium if anything somewhat lower than in neighbouring countries (other than Luxembourg) there is in fact room for some increase, if environmental considerations require it. Not much is likely to happen on road use unless the cost goes up: for example, the development of the regional rail (RER) system for Brussels - a carrot to induce people to use mass transit - will be less effective in reducing road congestion unless a stick - such as road or access pricing combined with taxation of inner city parking - is also provided. And this would need to be linked to other long-term policies such as development planning.

58. Kyoto and Göteborg represent two important international commitments for which little in the way of concrete planning seems to have been done. While not having a plan may be no worse than implementing a bad plan, measures at some point will have to be taken. The federal structure is a potential problem - will the national reduction targets all apply directly to each region, or will there be an internal burden sharing agreement? The regions deny that there will be a conflict, but this may change when concrete measures are developed; the best approach, certainly for CO_2, NOx and SOx , would be for national taxation or cap-and-trade systems to be developed quickly. Regional differences in abatement may

then emerge endogenously - and possibly compensation schemes be set up in response - without having arguments about them in advance slowing Belgian response and risking that it lags behind in implementation.

59. In so far as competitiveness problems make implementation politically difficult, Belgium could consider implementing a temporarily differentiated CO_2 tax, similar to the Danish CO_2 tax, where low polluting (and typically domestically-orientated) sectors are faced with a higher CO_2 tax rate than high polluting (and more export-orientated) sectors. Such a design is not optimal, but introduces a moderately coherent incentive system which can be corrected and adjusted gradually in line with tax developments in the EU to eventually impose one uniform CO_2 tax rate across the economy, thereby moving towards equalising abatement costs across different types of economic activities. The theoretically more appealing approach with infra-marginal tax rebates or trading permissions and high allocations for high polluters, demands a large degree of "give and take" actions, which may put the typically consensual Belgian administration under too much stress. Keeping in mind the additional complication concerning co-ordination across regions and social partners, such a "third-best-policy" measure might be advisable, if more efficient measures are simply not achievable.

60. The sustainable development plans, both regional and federal, have absorbed considerable intellectual resources and generated much public discussion. A successful outcome of this long process and the voluminous documentation generated by it would be the development of better focused targets and policies, a clearer view of costs and benefits (taking advantage of work being done in various Belgian institutions at the moment), and of the links and trade-offs between action in different areas, and mechanisms for systematic comparison of results with plans. As far as the federal plan is concerned it is too early to judge, but the draft plan is stronger on concepts and general arguments than on specific policies or targets, and some of the specific targets it does contain do not seem based on complete analysis. The role of public consultation and comment is in part to correct this.

61. The Environmental Performance Review for Belgium referred (in the case of chemicals) to "the burdensome procedure for consultation among various competent ministries and authorities, which strains Belgium's administrative framework" (OECD 1998, p. 177). Delays in complying with EU water directives may also be linked to such blockages accentuated by the delicate balances of the federal structure. The authorities believe that these were largely symptoms of a period, during the 1990s, of adjustment to the new and unfamiliar constitutional arrangements. It is hard to see any structure other than the current set of inter-regional and inter-ministerial committees giving any better co-ordination between the regions and federal government; some slowness in decision-making (particularly when involving more than one ministry, often the case in environmental issues), relative to a unitary state is inevitable. All the more reason, therefore, to ensure that internal regional procedures are as streamlined as possible. However, some inter-regional problems could actually be improved if market solutions to these problems were adopted within an appropriate institutional framework. Economic instruments to achieve environmental goals are no substitute for administrative framework regulations, but in general improve their enforcement and implementation. Although economic instruments may seem to be associated with higher visible and perceived costs, the long run gain in welfare should outweigh the structural adjustment burden occurring in the short run. The outlook for a competitive and strong Belgian economy to become environmentally more sustainable will improve, if the envisaged economic instruments are also implemented and enforced in the near future.

LIST OF ACRONYMS

BAT Best Available Technique
CCPIE Co-ordination Committee for International Environmental Policy
CHP Combined Heating and Power
CIE Inter-ministerial Conference on the Environment
CO_2 Carbon dioxide
EU European Union
GHG Greenhouse gas
KWh Kilowatt hour
MINA *Milieu en Natuur* (Environment and Nature)
NOx Nitrogen oxides
NH_3 Ammonia
N_2O Nitrous oxide
NPRE National Programme for Reducing CO_2 emissions
RER Réseau express régional
SOx Sulphur oxides
VAT Value Added Tax
VOC Volatile Organic compound

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