Assessment and recommendations

Following a period of rapid economic expansion in the 1990s, Portugal's economy grew modestly for much of the 2000s, and in 2008-09 entered a sharp recession as a consequence of the global economic downturn. The government responded with the adoption of a stimulus package to support household income, economic activity and employment. *Environment-related measures accounted for some 18% of the anti-crisis package* or 0.15% of GDP. Support for energy efficiency, renewable energy technologies and investment in electricity and smart grids constituted the core of the "green" stimulus measures. This reflects Portugal's priority of reducing external energy dependence and domestic greenhouse gas emissions, thereby improving overall competitiveness. The fiscal stimulus has helped to stabilise the economy in the short term. However, unemployment is projected to remain at a record rate of 10%. The country's public finances have deteriorated significantly, so fiscal consolidation will be a priority for the next few years.

Reforming the tax system, expanding environmentally related taxes and removing environmentally harmful tax concessions and subsidies could help fiscal consolidation without hampering economic recovery. As recommended by the 2001 OECD Environmental Performance Review, Portugal has made progress in *expanding the use of environmentally related taxes*, by introducing waste and water taxes, a tax on inefficient light bulbs, and CO_2 emission-based vehicle taxes. Revenue from environmentally related taxes increased during the review period and reached 8% of total tax receipts, well above the OECD average. This revenue is partly allocated to specific funds managed by several authorities, and earmarked for environmental purposes. This can reduce the flexibility of fiscal decisions and, therefore, overall efficiency of revenue allocation. The 2010-13 Stability and Growth Plan foresees strengthening environmentally related fiscal measures with a view to better maintaining their incentive function and to help improve fiscal sustainability.

However, *excise duty exemptions* apply to different uses of energy products and categories of users. *Reduced value added tax rates* are extensively used and apply, among others, to energy use in households and for agriculture. Many of these exemptions have been applied for several years with the objective of supporting poorer segments of the population and weaker economic sectors. Also, for social reasons, many municipalities that directly provide water and waste services do not pass on to consumers the water and waste taxes. However, such measures are usually a costly way to pursue equity objectives; they entail tax revenue losses, distort competition and investment decisions, and, by lowering end-use prices, can reduce incentives to use energy and natural resources efficiently. These disadvantages can be avoided, and social objectives achieved more efficiently, by providing targeted support to the affected groups. In the long-term, phasing out energy-related tax concessions is a more cost-effective way of reducing energy consumption than providing tax credits and other forms of support to households and businesses for investing in energy efficiency and renewable energy equipment.

The role of the business sector in financing *environmental expenditure* has increased during the review period, mostly with investments in end-of-pipe technologies. Nonetheless, the public sector continues to account for about two thirds of total environmental expenditure. EU funds have been a major financial source for public environmental investment. About 15% of available *EU funds* in the 2007-13 programming period have been allocated to environmental infrastructure, including renewable energy sources and energy efficiency. This also reflects an increased emphasis on more innovative sectors and on more advanced solutions to traditional environmental management issues. Programmes for allocating and using EU funds have been increasingly based on sound analysis of investment needs and identification of adequate progress indicators. They have contributed to improving environmental performance and administrative capacity in Portuguese regions. However, additional investment will be necessary in the near future if the ambitious goals for environment-related infrastructure are to be achieved. In the long term, the necessary resources, including those required for operating and maintaining environment-related facilities, will need to be provided through a more extensive involvement of the private sector and a well designed system of user charges.

Analysis suggests that *environmental companies and related employment* have increased in recent years, especially in the renewables, waste and water sectors. The wind and solar energy clusters represent good examples of green development, merging generation of power from renewable sources, production of the necessary technology and equipment, and job creation. However, the trade balance in environmental and renewable energy technologies remains negative. The share of R&D, in particular *environment-related R&D*, in public expenditure remains very low. Employment in the environmental goods and services sector is still mainly composed of low-qualified workers. Portugal needs to further

promote eco-innovation and improve its workforce skills, with a view to enhancing productivity, international competitiveness and growth prospects of its economy.

Recommendations

- Analyse *how environmentally related taxes could contribute to fiscal consolidation*, whilst offsetting reductions in more distortionary taxes on labour and corporate activity.
- Continue to *broaden the use of environmentally related taxes* by introducing other such taxes (*e.g.* on air pollutants and pesticides), and by linking a component of fuel taxes to the carbon content of fuels.
- Review the current array of *tax exemptions and discounts*, with a view to phasing out those that are costly and environmentally harmful; ensure that the *water and waste management taxes* are passed on to final users; provide *targeted support* for those households adversely affected by energy, water and waste prices.
- Progressively *decouple environmental expenditure from EU funding*, including through private investment and well designed user charges for environmental services.
- Develop and implement a *comprehensive framework for promoting eco-innovation and employment in eco-industries*, including increased public support for R&D, improved co-operation among competent authorities and with universities, the private sector and financial institutions, and investment in higher education and training; and green the jobs in the strategic sectors of the economy.

Box 2.1. **"Green" measures included in Portugal's fiscal stimulus package**

- Installation of solar panels and microgeneration units (miniwind): support for installation of 300 000 m^2 of solar thermal panels in residential buildings and 12 500 miniwind power plants in residential and commercial buildings. This measure was intended to strengthen the industrial clusters for manufacturing products using these technologies, with indirect impacts on other industrial sectors such as machinery and electric equipment. At the end of 2009, 255 000 m^2 of solar panels were ordered as a result of this fiscal support, representing a total value of EUR 95 million. This measure was extended to 2010 (entailing installation of an additional 120 000 m^2), with a view to gradually phasing it out.
- Improvement of energy efficiency in public buildings, *e.g.* hospitals, universities and public offices. This measure was expected to have a positive impact on the construction, metals manufacturing, machinery and energy auditing sectors, as well as contributing to a reduction of the public administration's energy bill. In 2009, 80 buildings were selected for an overall investment of EUR 40 million. Additional public investment of EUR 38 million was planned in 2010.
- Energy transport infrastructure: a measure bringing forward planned investment in the electricity grid and interconnection with Spain. This measure was expected to stimulate sectors such as metals manufacturing, machinery, electrical equipment and construction.
- Investment in smart grids, with the goal of connecting 10% of domestic electricity customers. Smart grids allow consumers to monitor and optimise their electricity consumption, as well as improving overall service and energy efficiency. This measure was expected to create a cluster for the manufacture of related equipment, with a strong impact on the construction sector. State support helped to launch the pilot phase in 2009.

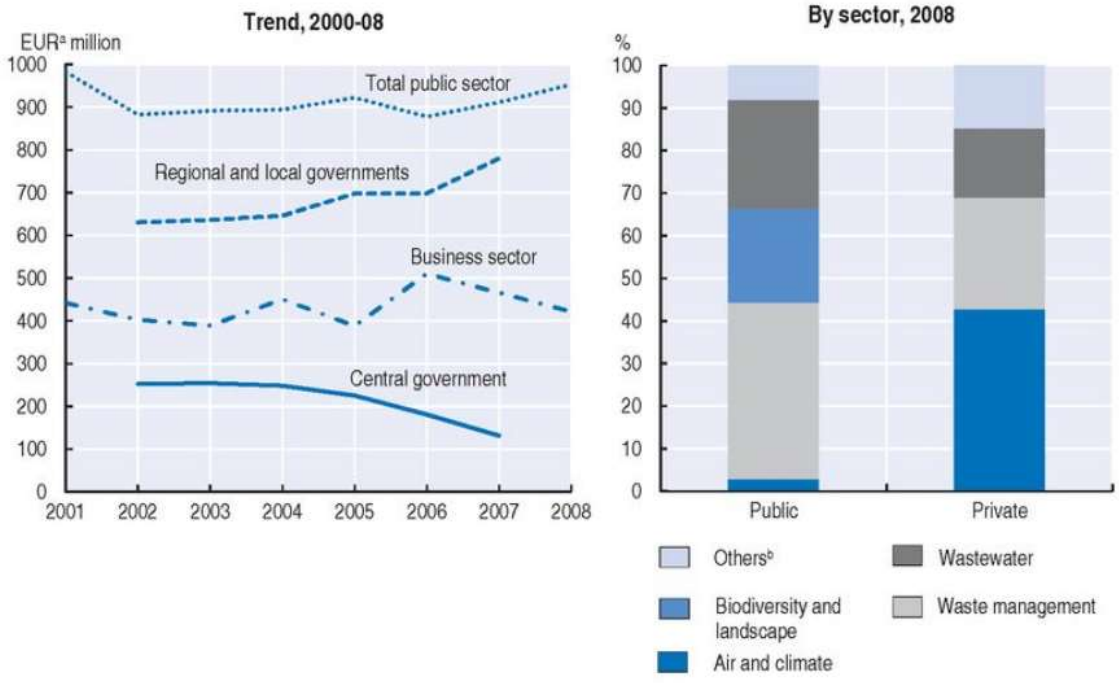
Source: Ministry of Finance and Public Administration.

The fiscal stimulus has contributed to *stabilising the economy* in the short term. In view of the deterioration of the country's public finances, in 2010 the government moved towards fiscal consolidation to reduce the budget deficit to 2.8% of GDP by 2013. The *fiscal consolidation programme* is mainly based on cuts in public spending, reduction of tax expenditure and extension of the privatisation plan. Some major investment projects, such as the Lisbon-Porto and Porto-Vigo high-speed railway lines, have been postponed. The 2010-13 Stability and Growth Plan foresees strengthening environmentally related fiscal measures as a means to improve fiscal sustainability (Section 3).

2. Environmental expenditure and financing

Public and private environmental expenditure decreased by about 3% in real terms between 2001 and 2008, but its share of GDP remained stable at nearly 1%. Public expenditure declined by 7% during the same period (Figure 2.2). The public sector continues to account for about two-thirds of total environmental expenditure. Public expenditure has been progressively decentralised from the central government to the regional and local governments, which account for 85% of public environmental expenditure, although with substantial financial transfers from the state budget. Local authorities continue to have little fiscal autonomy. Waste management, wastewater

Figure 2.2. **Environmental expenditure**



a) At constant 2005 prices.
b) Includes: soil and groundwater, noise, radiation, R&D, and other environmental protection activities.
Source: INE; MAOT; OECD (2010), *OECD Economic Outlook No.87;* OECD calculations.

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treatment and biodiversity made up the vast majority of public environmental expenditure in 2008. Waste management alone accounted for over 40% of such expenditure during this period. Growing attention to biodiversity has resulted in biodiversity conservation representing an increasing share of public expenditure. On the other hand, air pollution control, including climate change mitigation, has accounted for a very minor share, although this share has been rising since 2008 due to increased use of the Portuguese Carbon Fund (Figure 2.2).

In contrast, *private environmental expenditure grew* by over 5% in the same period, reflecting the increasing role of the private sector in financing activities related to pollution prevention and control, as well as in managing environmental infrastructure and services (particularly in the waste and water sector). Yet, less than half of enterprises carried out environmental protection activities in 2008 (INE, 2009). Investment by industry (including electricity production and distribution) grew by 2% in real terms between 2004 and 2007 before sharply decreasing the following year, mainly due to the economic crisis. Environmental investments in the electricity production and distribution sector grew six-fold between 2004 and 2007. Participation in the EU ETS and the requirements of the EU directives on large combustion plants and on integrated pollution prevention and control (IPPC) have driven investments in this sector. This is indicated by the dominance of investment in controlling air and GHG emissions, which account for nearly 90% of environmental investment in the electricity industry. Air and climate are the key investment areas for most industrial sectors, followed by wastewater and waste management (Figure 2.2). Waste management is the main operating cost for most industrial activity, followed by wastewater management. *Environmental investment by industrial companies* is concentrated in the electricity and water industries (60% of total environmental investment by industry) and in energy intensive sectors (refined petroleum

products, non-metallic minerals, pulp and paper). Overall, investments in end-of-pipe technologies have been prevalent, as opposed to so-called "integrated" investments.[1]

Financing and EU funds

Portugal has been a *major beneficiary of EU funding*. EU transfers (adjusted for purchasing power parities) fell from over EUR 300 per capita in the programming period 2000-06 to about EUR 260 per capita in the period 2007-13, although remaining the highest in the EU 15. Transfers from the Structural and Cohesion Funds amounted to about 60% of total public capital expenditure in Portugal (EC, 2007).

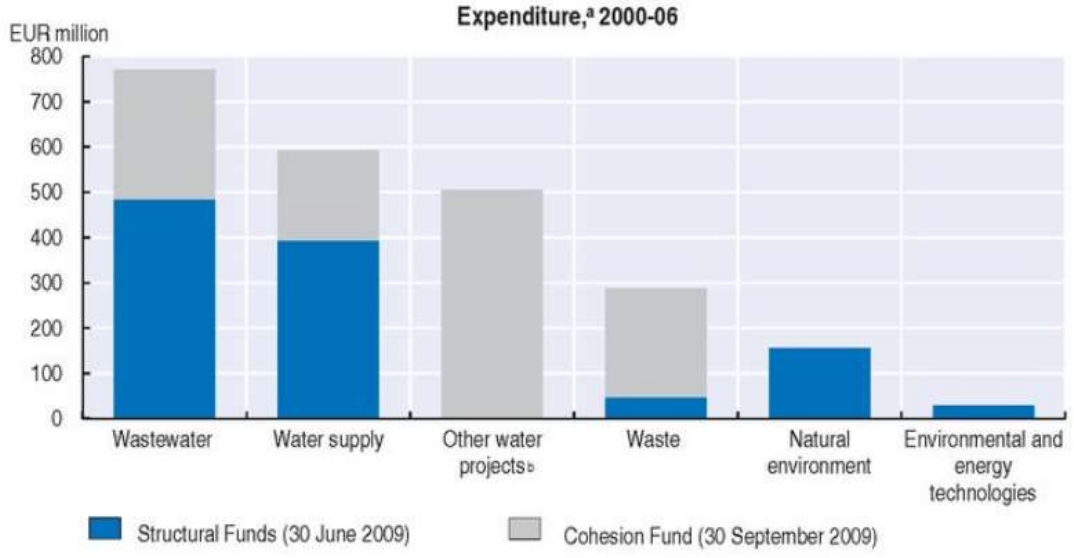
EU funding has been an important source of financing of public environmental investments. During the *programming period 2000-06*, total investment in environmental infrastructure was EUR 7.9 billion or 0.8% of GDP, the highest share in the EU 15.[2] Public funding, including national and EU funds, accounted for over 80% of financing, some 40% of which was covered by EU funds. Loans by the European Investment Bank accounted for an additional 16% of public investment (EC, 2010). In the same period, the EU's contribution to environmentally related investments was over EUR 2.3 billion. This is equivalent to 9% of the EU funds (Structural and Cohesion Funds) allocated to Portugal. The water sector received the vast majority of these funds, followed by the waste sector (12%) and nature protection (7%). A minor share was spent to promote environment-friendly technologies in businesses (Figure 2.3).

For the *programming period from 2007-13*, over EUR 5 billion in EU funding has been allocated to improving the environment, promoting sustainable growth and combating climate change, representing 23% of the total available EU contribution (excluding national co-financing). These objectives are pursued through direct investments in environmental

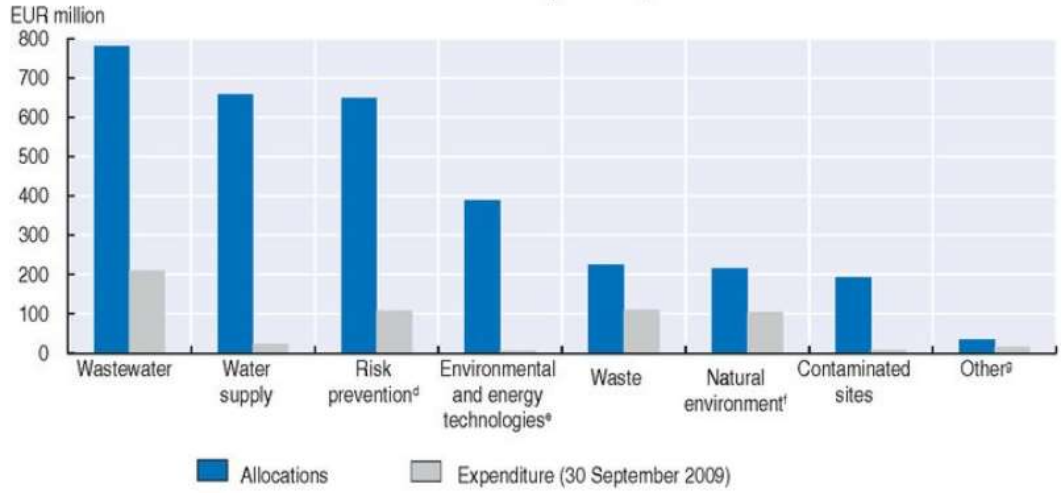
infrastructure and tying aid to other projects, such as financial assistance to enterprises, to meet specified environmental criteria. Over EUR 3 million (about 15% of available EU funds) has been allocated to environmental infrastructure, including renewable energy sources and energy efficiency. This represents marked growth in the share of funds earmarked for environmentally related investment compared to the previous programming period, reflecting higher policy priority. The water sector (especially wastewater treatment) remains the highest investment priority, absorbing 46% of the EU contribution to environmental infrastructure expenditure. Compared to the previous period, more attention has been given to preventing natural and industrial risks and to environmental technologies, including clean energy technologies, whereas a lower share of funds has been earmarked for waste management (Figure 2.3). Overall, there is increased emphasis on more innovative sectors, such as renewables, and on more advanced solutions to traditional environmental management issues, such as tertiary wastewater treatment and biological waste treatment.

Portugal has been among the *best performers in managing EU funds*, including for environmental projects. Overall, the allocation and use of such funds has been based on a sound analysis of investment needs and identification of adequate progress indicators. EU funds have contributed to improving quality of life and developing environmental infrastructure and administrative capacity in Portuguese regions. As in many other countries, the main tangible results of EU funding with regard to the environment has been the increasing number of households connected to wastewater treatment systems and drinking water supply, as well as improved waste management (EC, 2010). However, at the end of the 2000-06 programming period, infrastructure gaps remained and additional

Figure 2.3. **EU funds for environmental investments, 2000-06 and 2007-13**



Allocations and expenditure,[c] 2007-13



a) Expenditure on air quality and noise pollution is negligible and is excluded.
b) Includes mixed water supply and wastewater projects and the Alqueva multipurpose water project.
c) Includes Structural Funds and the Cohesion Fund.
d) Includes other measures to preserve the environment and prevent risks.
e) Includes support for renewable energy sources and energy efficiency.
f) Includes promotion of biodiversity and nature protection (including Natura 2000), promotion of natural assets, protection and development of natural heritage.
g) Includes air quality, integrated pollution prevention and control and clilmate change mitigation and adaptation.
Source: Instituto Financeiro para o Desenvolvimento Regional; Observatório do QREN; OECD calculations.

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investment was still called for to ensure strict compliance with the EU environmental *acquis*. Investment needs for the water and waste sectors in the period from 2007-13 were estimated at EUR 3 billion and EUR 1 billion, respectively (EC, 2006). Despite significant contributions from EU funds, overall public funding is likely to be insufficient to cover such demanding investment needs, especially when Portugal's strained public finances and the projected slow economic recovery are taken into account. Moreover, consideration should be given to the means required to operate and maintain environmentally related facilities. According to some estimates, the challenge of financing current environmental expenditure is almost as large as that of financing annual investment expenditure (EC, 2010). In the long term, the necessary resources will need to be provided through more

extensive involvement of the private sector and more efficient application of user charges – especially in the waste and wastewater sectors, where cost recovery has remained low.

3. Environmentally related taxes

Portugal's *tax revenue to GDP ratio* increased during the review period as a consequence of the government's fiscal consolidation policy. It was 35.2% in 2008, in line with the OECD average. The overall tax structure has broadly stabilised since 2000. Compared to that of many other countries, the Portuguese tax mix tends to rely more on consumption taxes owing to the large share of consumption in the economy (OECD, 2010b). In 2008, taxes on goods and services, including those on energy and transport, accounted for about 37% of total tax revenues, considerably above the OECD average (nearly 32%).

As in all OECD countries, *environmentally related taxes* largely coincide with taxes on energy use and vehicles. Revenue from environmentally related taxes (in real terms) increased by 16% between 2000 and 2007.[3] It accounted for 2.6% of GDP and 7.2% of total tax receipts in 2008, above the corresponding shares in the OECD as a whole (Figure 2.4). The role of environmentally related taxes has increased since 2000. However, revenue from fuel taxes was exceptionally low in 2000 due to a decrease in the excise duty on transport fuels to compensate for increased oil prices (Figure 5.7). Overall, revenue from environmentally related taxes has stabilised at a level below that of the late 1990s, both in absolute terms and as a share of GDP and total tax receipts (Figure 2.4). As explained below, reduced revenue from vehicle taxation in the 2000s is the main factor underlying this trend.

Taxes on energy products

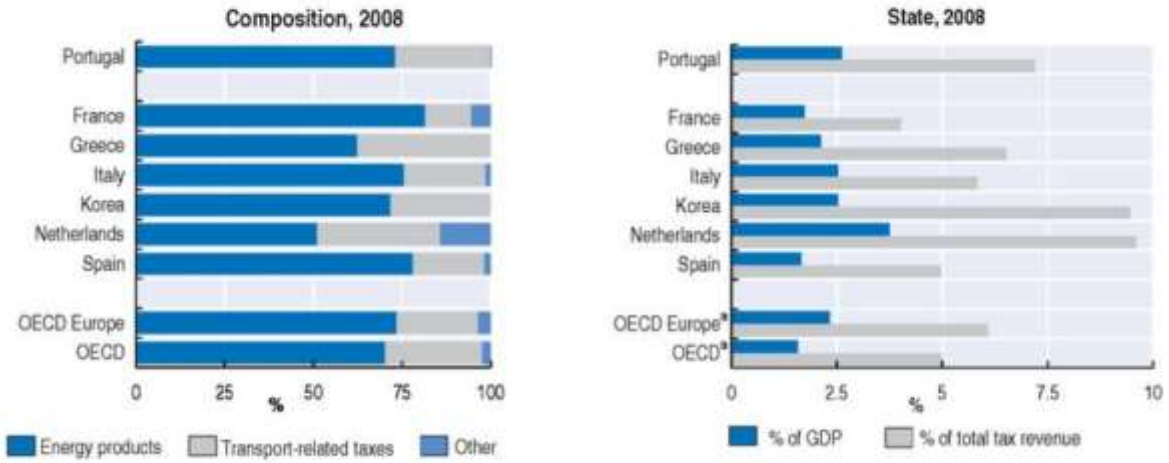
Excise rates on energy products generally exceed the minimum levels required under EU legislation. In particular, tax rates on transport fuels are relatively high compared to those

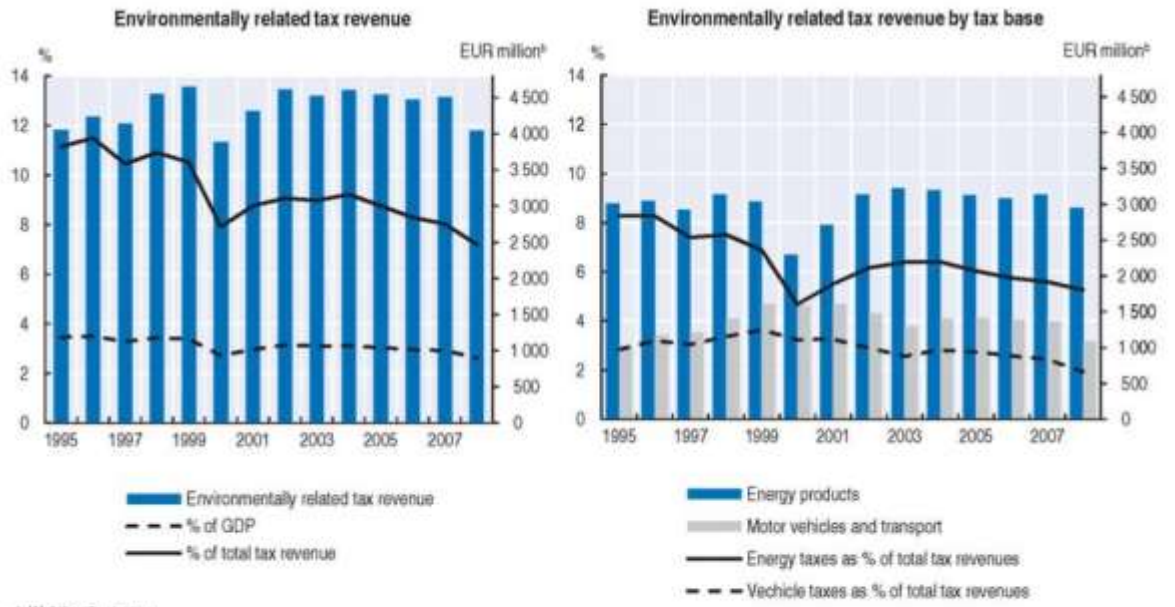
in many OECD Europe countries and were repeatedly adjusted for inflation during the review period (Chapter 5). As a result of this rate increase and heavy reliance on road transport, Portugal collects more fuel taxes as a percentage of GDP than most other OECD countries (OECD, 2010b). Fuel taxes account for 73% of environmentally related tax revenue, in line with the OECD Europe average (Figure 2.4). A share of the revenue from excise duties on energy products is earmarked for the Forest Fund and the Portuguese Carbon Fund.

Vehicle taxation

Vehicle taxation has long been an important source of revenue for the Portuguese government. Following the 2007 reform, both the *registration tax* on vehicle purchases and the annual *circulation tax* are now differentiated on the basis of CO_2 emission levels and cylinder capacity, with the former gradually becoming more important. The rates were redesigned in order to shift part of the tax burden from the registration tax to the annual tax. Since 2000, a discount has applied to the registration tax when a new vehicle is purchased at the same time an old one is scrapped. The registration tax has been linked to CO_2 emission levels since 2009. While these taxes are theoretically less efficient than fuel taxes and road charges in reducing emissions, they have proved effective in changing the composition of the car fleet towards new and more fuel-efficient cars (Chapter 5). Together with the stabilisation of car sales since 2003 and loss of revenue due to the *car scrapping incentive* (Section 4), this has resulted in lower revenue from vehicle taxation and, ultimately, has reduced total revenue from environmentally related taxes (Figure 2.4).

Figure 2.4. **Environmentally related taxes**





a) Weighted average.
b) Constant 2005 prices.
Source: OECD/EEA database on instruments for environmental policy; OECD (2010), *OECD Economic Outlook No. 87*.

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Other environmentally related taxes

Portugal has made progress in using taxation as an instrument in sectors other than energy and transport. A *tax on inefficient light bulbs* (paid by manufacturers and retailers) has been in force since 2007. The revenue is used to finance the Energy Efficiency Fund and the Portuguese Carbon Fund (Chapter 5). The *local property tax on buildings*, both residential and commercial, is reduced when renewable energy source equipment and solar panels are installed.

Waste related taxes were introduced in 2007. They include a tax on licensing of waste management activities and a *waste management tax*. The latter is calculated per tonne of waste disposed or treated by operators of waste management activities (Chapter 3). Tax rates are higher for waste disposed in landfills than for waste that is incinerated. The rates increase by 50% if the disposed waste is recyclable. This tax is expected to be an incentive

to divert waste from landfill towards more efficient management and treatment. The tax receipts are collected by the Portuguese Environment Agency (APA) and the Regional Co-ordination and Development Committees (CCDRs). The revenue is earmarked for financing these authorities' activities and supporting the activities of waste management operators.

In 2008, Portugal introduced a *water resource levy* on water abstraction and discharges. The abstraction levy is calculated per cubic metre of water withdrawn. The rates differ according to category of use. The discharge component is calculated on the basis of the quantity and type of the discharged pollutant (total nitrogen, total phosphorous, total oxidants) (Chapter 3). The water resource levy is paid by licensed operators and the revenue is shared among the Water Resource Protection Fund, the Water Institute (INAG) and the River Basin District Administrations. It is earmarked to partially cover water management costs and improve the efficiency of water use and the quality of water resources and ecosystems.

Both the waste management tax and the water resource levy paid by licensed operators should be passed on to final consumers through charges for waste, water and wastewater services. However, owing to social acceptability concerns, *many municipalities that directly provide water and waste services do not pass the water and waste taxes on to consumers*, weakening the incentive for households and businesses to save water and reduce waste generation and wastewater discharges.

Assessment

Portugal needs to *streamline its tax system* to come to grips with urgent and potentially conflicting objectives: raising tax revenues to cope with the high fiscal deficit, while promoting economic growth. The 2010 OECD Economic Survey of Portugal recommended

moving away from labour taxation towards less distortive taxes, such as those on consumption and property (OECD, 2010b).[4] Broadening the use of indirect taxes on consumption of goods and services that are potentially harmful to the environment can also contribute to these goals. Such taxes would generate revenue that could help the government with fiscal consolidation and/or be used to partly reduce taxes on households and businesses, thereby promoting economic growth. Their regressive nature should be addressed through targeted social benefit schemes.

As recommended in the 2001 OECD Environmental Performance Review, Portugal has made *progress in developing the use of economic instruments* in the provision of environmental services, and in strengthening the guidance function of environmentally related taxes with regard to transport (Reference II), through the introduction of waste and water taxes, and restructuring of vehicle taxation on the basis of CO_2 emissions. While there are no current plans for a comprehensive "green tax reform", the 2010-13 Stability and Growth Plan foresees strengthening environmentally related fiscal measures with a view to better maintaining their incentive function and helping improve fiscal sustainability (Box 2.2). However, some of the planned measures consist of tax credits and other forms of fiscal incentives that could increase government spending and prove a costly way to pursue environmental objectives (see also Section 4). Portugal could consider introducing other taxes (*e.g.* on air pollutants, pesticides and packaging materials) and restructuring existing taxes to better reflect environmental externalities (*e.g.* linking a component of fuel taxation to fuels' carbon content) (Chapter 5). Fiscal consolidation and economic recovery objectives could be achieved more efficiently if Portugal allowed greater flexibility in the use of revenues from environmentally related taxes, which are now partly earmarked to specific funds.

Box 2.2. **The role of environmentally related fiscal measures in Portugal's fiscal sustainability plan**

Portugal's Stability and Growth Plan 2010-13 foresees:

- introducing a fiscal incentive for purchases of electric vehicles by businesses, while discouraging purchases of conventional fuel-powered vehicles, and the provision of electric vehicles as benefit-in-kind to employees;
- extending tax credits for the purchase of energy-efficient equipment;
- extending the excise duties on energy products to electricity, as required under EU legislation;
- revising the vehicle registration tax by annually reducing the CO_2 emission categories by 5g/km, so as to maintain the revenue-raising ability of the tax and better link it to development of the car market;
- rationalisation of tax expenditure related to excise duties on energy products, linking fiscal benefits and exemptions to more rigorous environmental criteria;
- rationalisation of tax expenditure related to vehicle taxes, linking fiscal benefits and exemptions to more rigorous environmental criteria. In particular, the car scrapping tax incentive was limited to the purchase of vehicles with CO_2 emissions up to 130g/km in 2010 (compared to 140g/km in 2009) and is restricted to the purchase of electric vehicles from 2011.

Source: Ministry of Finance and Public Administration.

4. Tax expenditure and subsidies

The Portuguese tax system is characterised by *extensive tax expenditures* (*e.g.* tax credits, allowances and exemptions), which narrow tax bases and hence require higher than otherwise tax rates (OECD, 2010b).[5] Excise duty exemptions apply to different uses of energy products and categories of users (Chapter 5). In addition, reduced value added tax (VAT) rates are used extensively. The reductions apply, among others, to heating oil and diesel used in agriculture, household consumption of natural gas and electricity, oil and gas exploration and development activities, equipment for the generation and use of energy from some renewable sources, pollution control equipment, agricultural inputs and machinery, waste collection and water supplies. VAT reductions on energy use in households amounted to over EUR 620 million in 2004 (Kosonen and Nicodème, 2009). This was the equivalent of 0.4% of GDP, compared to 0.07% of GDP in the EU 15.[6] Many of these exemptions and the reduced VAT rates have been applied for several years on the grounds that they support vulnerable segments of the economy and population. However, this rationale has become weaker. Such tax expenditures represent lost revenue for the government, distort competition and investment decisions, and (by lowering end-use prices) can reduce incentives to use energy and natural resources efficiently.

Portugal provides several *environmentally related tax discounts* to both households and businesses. Households can claim tax credits for, among others, the purchase of houses meeting energy efficiency standards, energy-efficient renovation work, installation of energy-efficient equipment, microgeneration units and solar panels, and purchases of electric vehicles. Electric vehicles are also exempt from registration and circulation taxes and stamp duties. Similarly, businesses can benefit from tax credits or special depreciation rates on investment costs for improving energy performance and purchasing fuel-efficient

vehicles. A car scrapping programme has been in force since 2000, providing large discounts on the vehicle registration tax (limited to electric vehicles from 2011).

Overall, the *tax expenditure for energy and vehicle related incentives* has increased during the last few years, reaching EUR 145 million in 2008 (Table 2.1). Environmentally related tax credits account for a minor part of household and corporate income tax. However in 2008, tax expenditure on vehicles made up about 16% of vehicle tax revenue, up from 5% in 2006, and exemptions from energy taxes represented 9% of the respective revenue. Tax expenditure linked to the *car scrapping programme* steeply increased between 2006 and 2009, reaching EUR 51 million or 7.2% of registration tax receipts in 2009.[7] It represented the largest fiscal benefit for the purchase of goods. The Ministry of Finance has estimated that limiting the tax rebate to the purchase of cars with low CO_2 emissions in 2010 reduced the amount of lost revenue to about EUR 28 million, or 3% of registration tax receipts. The OECD has recommended considering the impact of such tax expenditure on the government's budget, which is particularly important at a time of economic recession, and broadening the tax base by reducing allowances and deductions (OECD, 2010b). Tax expenditures are frequently a costly way to pursue equity objectives. They may even be regressive, *i.e.* benefiting higher income earners most. Portugal should assess such expenditure in terms of potential negative impacts on the environment. Similarly, tax credits and allowances to encourage environment-friendly purchases and investment are less cost-effective in reducing environmental impacts than charges on the activities that generate such impacts, although they can be helpful in addressing other market failures or barriers (*e.g.* lack of information, difficult access to credit) and in stimulating related economic sectors at times of crisis.

Table 2.1. **Energy- and vehicle-related tax expenditure,[a] 2006-08**

(EUR million)

Fiscal benefit	2006	2007	2008
Oil and energy tax (ISP), *of which:*	240.1	261	226.8
Coastal and inland waters navigation, including fisheries	26.7	26.9	24.8
Agricultural machinery	62.3	74.3	70.9
Heating	69	60.7	43.3
Biofuels	30.5	50.1	45.4
Tax on motor vehicles, *of which:*	59.6	95.5	143.8
Diplomats, nationals of other EU countries, nationals of third countries, etc.	24.9	35.1	24.5
Passenger motor cars with hybrid engines	1.6	1.8	
Car scrapping incentive	7.4	18.8	44.8
Reduction of particles emissions		13.1	47.4
Personal tax, *of which:*	5.8	6.6	7.4
Renewable energy equipment	5.8	6.6	7.4
Total	**305.5**	**363.1**	**378**
of which, environmental protection incentives	45.3	90.4	145

a) Excludes revenue losses due to reduced VAT rates.

Source: Ministry of Finance and Public Administration.

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Energy subsidies

In addition to the above mentioned energy related tax expenditure, Portugal provides various forms of *financial support to the energy sector*. These include investment subsidies,

co-funded under EU funding mechanisms, for the development of electricity and natural gas infrastructure and networks (IEA, 2009). Government support to finance infrastructure development should be progressively phased out once liberalised energy markets are mature. Attention should be focussed on providing a good investment environment through stable policy and regulatory frameworks. Business and household investments in energy efficiency equipment also benefit from direct support in the framework of the National Energy Efficiency Action Plan, and electricity produced from renewables is supported through a favourable pricing policy (feed-in tariffs) (Chapter 5). The costs and benefits of such support should be regularly assessed, taking into account the policy objectives for which it is provided and the incentives faced by energy operators within the EU ETS, with a view to gradually eliminating unnecessary, costly and distorting forms of subsidisation.

Subsidies to agriculture and fisheries

Support to agriculture in Portugal follows the rules of the EU Common Agricultural Policy (CAP). Support to EU farmers (as measured by the OECD Producer Support Estimate, PSE) declined on average from 33% of farm receipts in 2000-02 to 23% in 2007-09, broadly in line with the OECD average. Direct aid to farmers has been progressively untied from agricultural production and input use: 44% of EU support to farmers in 2007-09 was based on output and input quantities, the forms of support that most encourage production, compared to about 65% in 2000-02. Direct aid to farmers is also conditional on meeting specified environmental standards (cross-compliance) and adoption of good farming practices (defined as levels of environmental quality to be achieved at farmers' own expense). Expenditure on agri-environmental measures in Portugal continued to rise in

the 2000s, accounting for around 25% of expenditure funded by the European Agricultural Fund for Rural Development in 2008 (Vojtech, 2010).[8]

However, Portuguese *farmers benefit from a number of reductions in input costs*, with implications for the environment. A tax concession on diesel fuel provided for tractors and farm machinery was equivalent to EUR 70 million in tax revenue foregone in 2008 (Table 2.1). Concessional VAT rates apply to a range of agricultural inputs and equipment. Water use for irrigation benefits from a reduced water resource levy. In the case of private irrigation projects, farmers pay the full operating and capital costs, although investment in irrigation equipment has been increasingly financed by both national and EU funds with variable non-recoverable contributions. Farmers who benefit from public irrigation projects are not charged for any part of the capital expenditure on infrastructure outside the farm, but they pay an average 90% of the maintenance and distribution costs (Garrido and Calatrava, 2010).

The EU Common Fisheries Policy provides the framework for Portugal's *support to fisheries*. Government financial transfers (GFTs) to the fishing industry fell in the last decade (by 8% between 1997 and 2007). GFTs averaged about EUR 20 million per year in 2005-07, or about 10% of the value of the total catch from capture fisheries, in line with the EU average. Direct aid to fishers represented a minor part of total support to fisheries (OECD, 2010c). Portugal provides subsidies to fishers for fleet reduction (scrapping of vessels) and renewal of existing fishing vessels, *e.g.* to improve safety and working conditions, promote use of more selective and environment-friendly gear and increase fuel efficiency. In this respect, renewal of the fishing fleet might be accelerated more cost-effectively by phasing out the excise duty exemption on fuel used in the sector (Table 2.1).

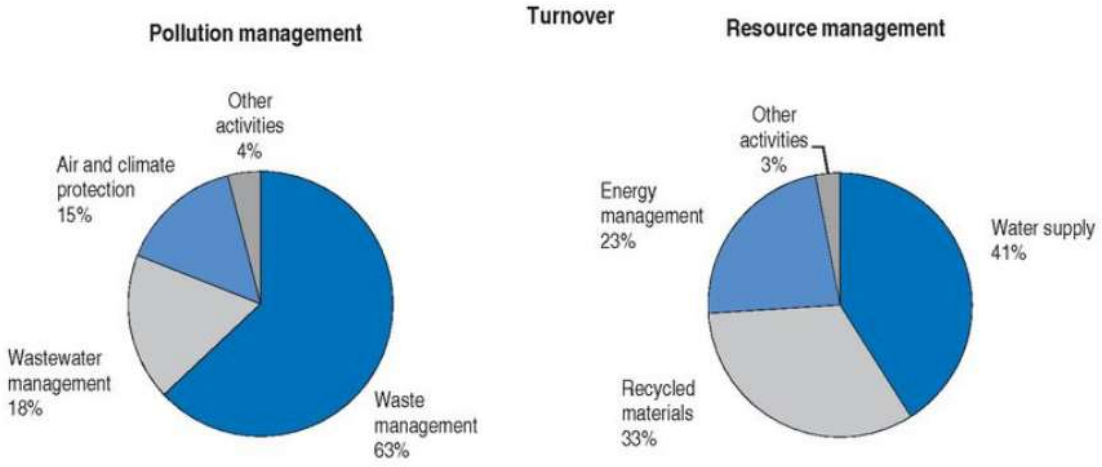
This is shown by increased efforts at the OECD level to improve technology and change skipper behaviour in response to the 2008 fuel price shock (OECD, 2010c). Aid is not linked to production or to investment in new vessels, which have the greatest potential to reduce fish stocks. However, as in other EU countries, productivity gains due to renewal and modernisation of the fleet are likely to have offset measures to limit fishing efforts (Chapter 4).

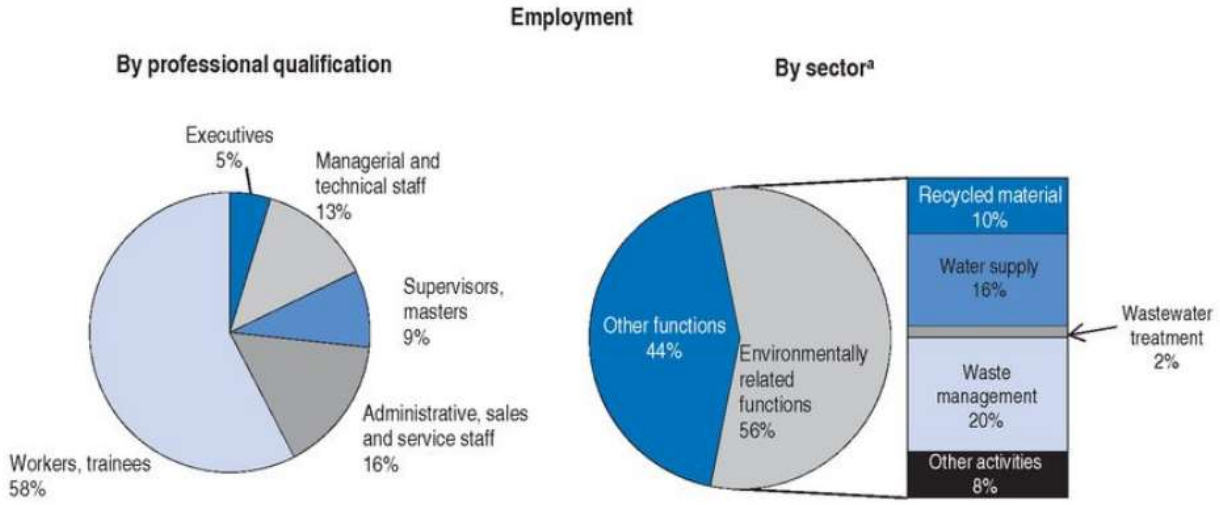
6. Expanding environmentally related markets and employment

In 2008, Portugal's National Statistics Institute (INE) started to collect and provide information on the *environmental goods and services (EGS) sector*, which includes the production of goods and provision of services whose main goal is environmental protection. Notwithstanding the limited time series data available, there is some evidence that the EGS sector has grown in recent years: its turnover increased by about 10% (in real terms) between 2007 and 2008 despite Portugal entering recession in late 2008.[16] This sector represented about 3% of GDP in 2008.

Pollution management activities, such as air protection and waste and wastewater management, accounted for nearly 60% of the EGS sector's turnover in 2008 and grew by about 20% compared to the previous year. Waste management (collection and treatment of waste) made up nearly two-thirds of the pollution management industry's turnover, followed by wastewater treatment (Figure 2.6). *Resource management activities*, including water supply, recycled materials and energy management, remained virtually stable during this two-year period. Water supply accounted for over 40% of turnover, followed by recycling (Figure 2.6).

Figure 2.6. **Turnover and employment in the environmental goods and services sector, 2008**





a) Data refer to 2007.
Source: INE.

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Most EGS companies provide pollution and resource management services, which account for 80% of the sector's turnover. The remainder mainly consists of the manufacture of environmentally related products. The manufacture of environmental equipment accounts for a marginal share of turnover: it mainly comprises production of equipment for air pollution control, accounting for 13% of the turnover of companies in the air pollution branch.

Most products and services produced by Portugal's EGS sector are sold on the domestic market. The business sector is the main customer, accounting for over 60% of domestic turnover, followed by public administration (about 20%). Exports, which increased by 18% between 2007 and 2008, were mostly sent to other EU countries.

Overall, the industrial sector has increasingly invested in environmental protection (Section 2). *Many industries have also started to profit from environmental protection activities*, especially from the sale of waste and recycled materials. For example, the metal and transport equipment industries produce large amounts of valuable waste and materials. The establishment of an online waste exchange platform in 2009 was expected to contribute to further development of the recycled materials sector and enhancement of waste recovery (Chapter 3).

Employment in the EGS sector decreased by 2% in 2008 compared to the previous year. Little more than half of those employed in eco-industries actually carried out environmentally related functions, most of which were concerned with water supply and waste management (Figure 2.6). The sector is characterised by *low-skill employment*: 58% of employees were unskilled workers and trainees in 2008, and most of them were employed in waste collection. This is despite an increase in the number of graduates in environmentally related subjects, who accounted for nearly 7% of total graduates in 2005-06 (Lobo, 2010). Overall, environmentally related jobs account for a relatively low share of employment in Portugal's industrial sector (including industries other than EGS). Less than 12% of employees carry out environmental protection functions during more than half of their working hours. Environmentally related functions account for a larger share of employment in the textile and pulp and paper industries than in others.

Expenditure and financing

Total public expenditure on biodiversity and landscapes increased from EUR 132 million in 2002 to 244 million in 2007, a 13% annual increase. About half was co-financed by the EU, including through the LIFE Nature and INTERREG programmes.

In 2007, the EU started to co-finance the *Natura 2000* network (EUR 20 million per year) under the *Rural Development Programme* (PRODER), which covers the period 2007-13. However, the level of PRODER payments (EUR 200/ha/year) is often not sufficiently attractive to farmers and the EU regulation does not provide much space for improvement. Cross-compliance requirements are attached to the payments.

EU support for the *Natura 2000* network is only 3% of *total EU support to Portuguese agriculture* (Table 3.3). However, the single payment scheme has been gradually introduced since the 2003 reform of the Common Agricultural Policy (CAP) and has been subject to cross-compliance since 2005. Very few payments are still based on either quantity produced or acreage/headage. Apart from payments to *Natura 2000* sites, very few are based on specific environmental outcomes.

A *fund for nature conservation* was established in 2009, as provided by the new Nature Conservation Act. While its public budget allocation is still under discussion, efforts are being made to raise the level of private funding. In particular, developers must pay a one-off tax. For example, in 2009 the water company *Aguas de Algarve* paid EUR 6 million into the fund to offset the Odelouca dam's negative impact on the habitat of the Iberian lynx. It will be used to finance *ex situ* protection through the creation of a reproduction centre.

A *permanent forest fund* was established in 2004, financed by a surtax on consumption of oil products. The 2006 National Forest Strategy identifies six priority windows of financing (MADRP, 2006). Priority is given to multifunctional forest management,[34] indigenous species (*e.g.* oaks) in substitution for fast-growing ones (*e.g.* eucalyptus), marketing promotion of non-wood products (*e.g.* mushrooms, nuts, medicinal and aromatic plants) and private research. Other priorities are driven more by production than environmental criteria.

The *EU Business and Biodiversity (B@B) Initiative* was launched in 2007 during Portugal's EU Presidency. It aims to enhance business and financial sector voluntary engagement through a B@B platform. Fifty Portuguese firms participate on a voluntary basis.

Table 3.3. **EU and national support to Portuguese rural development**

EUR million

Pillar/Axis of the Common Agricultural Policy (CAP)	2000-06[a]	2007-13[b]	Comment
1st: Improving the competitiveness of agriculture and forestry	1 848	2 136	Includes investments in irrigation infrastructure
2nd: Improving the environment and countryside	1 515	1 809	
Mountainous and less favoured areas[c]	*405*	*741*	760 000 ha in 2007
Agri-environmental measures	*771*	*447*	220 000 ha in 2007 (6% Utilised Agriculture Area)
Afforestation of farmland	*339*	*300*	
Natura 2000 network[d]	–	*321*	45 000 ha in 2007
3rd: Quality of life and diversification of the rural economy + LEADER	220	493	Includes provisions for nature tourism[e]
Total	**3 583**	**4 438**	

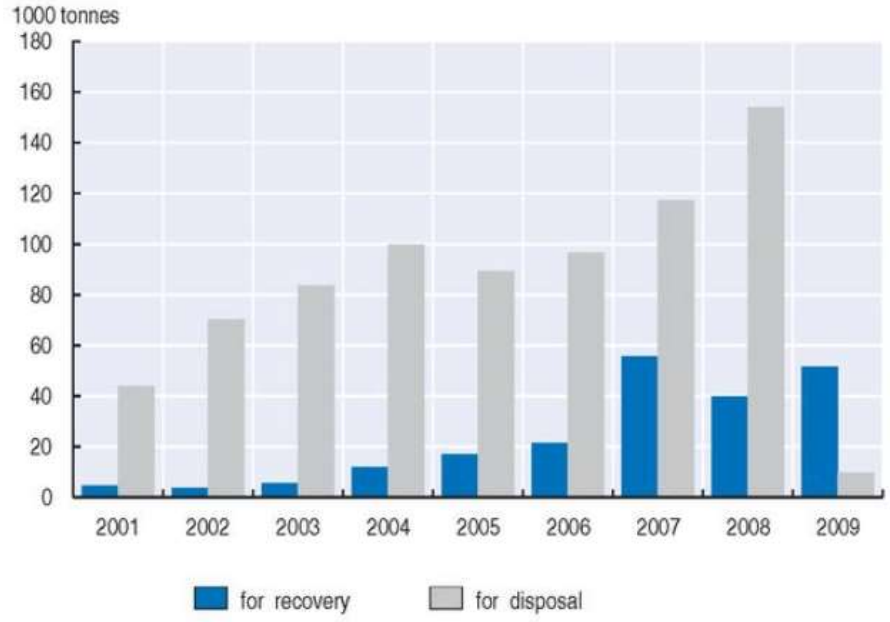
a) European Agricultural Guidance and Guarantee Fund (EAGGF) and national co-financing.
b) European Agricultural Fund for Rural Development (EAFRD) and national co-financing. Planned allocation.
c) Areas where agricultural production is difficult (*e.g.* slopes).
d) Integrated Territorial Interventions (ITIs).
e) In addition, in 2007-13 the European Regional Development Fund (ERDF) includes EUR 20 million/year for nature tourism.

Source: EU and MADRP.

2. Trade and environment

Portugal implements the EC Regulation on shipments of waste,[11] which applies the provisions of the Basel Convention concerning the control of *transboundary movements of hazardous waste* and the OECD Council Decision on the control of transboundary movements of waste destined for recovery operations [C(2001)107/Final]. Its exports of hazardous waste increased four-fold between 2001 and 2008, reaching nearly 200 000 tonnes in that year (Figure 4.1). Portugal was slow to develop its hazardous waste treatment capacity. Nearly ten years[12] after its commitment to self-sufficiency, two specialised facilities[13] started to operate in 2008. Although legal provisions encouraging hazardous waste treatment by co-incineration in cement kilns exist, this type of treatment has been limited due to public opposition. With the new facilities operating, the amount of hazardous waste shipped for disposal fell in 2009. Spain continued to be the primary destination of Portuguese waste exports, mainly for metals recovery and refining of used oil. In 2008, 31 000 tonnes of non-hazardous waste[14] (paper, metal, recovered plastics) was sent for recovery, mainly to Spain and China.

Figure 4.1. **Exports of hazardous waste, 2001-09**



Source: Portuguese Environment Agency.

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Portugal actively collaborates with other European countries to *prevent illegal waste transport*. Within the framework of the EU Network for the Implementation and Enforcement of Environmental Law (IMPEL) cluster on transfrontier shipment of waste (TFS), it has performed an increasing number of inspections, some jointly conducted with Spain. Of 1 281 transport controls (inspections of containers, trucks, trains and documents) between October 2008 and June 2009, 68 concerned transboundary shipments of waste, of which 35% turned out to be in violation of the EC Regulation on shipments of waste (EC, 2009).

In recent years, there have been about 300 seizures of illegal wildlife products (mainly mammals, reptiles and birds) per year. In 2009, legislation was enacted to improve implementation of the *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) and compliance with the related EU regulations. Under this law, fines ranging from EUR 500 to 2.5 million may be imposed depending on the severity of the offence. The Institute for Nature Conservation and Biodiversity (ICNB) was given formal responsibility for co-ordinating CITES enforcement, as part of a group including representatives of Customs, the Food and Safety Authority, the Veterinary Service, the General Public Prosecution Office, the Nature Protection Service of the National Guard, and regional administrative authorities. Since 2007, serious CITES offences have been subject to penal sanctions. Two criminal prosecutions for illegal trade in birds were mentioned in the 2007-08 Portuguese report to the Convention. Portugal co-operates with Brazil, Spain, the Netherlands and the United Kingdom to uncover illegal activities and investigate offences. However, CITES enforcement is often impeded by limited resources and expertise, while in practice, fines are often not imposed.

3. Bilateral and regional co-operation

Co-operation with Spain on *water* has progressed within the framework of the Convention on Co-operation for the Protection and Sustainable Use of Waters of the Portugal-Spain River Basins (*the Albufeira Convention*), which was signed in 1998. The Convention regulates use, quality and minimum flows and implements European law in the five main cross-border river basins. Information exchange has improved and a number of co-operative projects have been implemented, particularly in the Guadiana Basin. However, neither country met the EU Water Framework Directive's deadline for developing river basin management plans by 2009. In 2008, a new Protocol to this Convention was

signed in order to define minimum quarterly and biannual flows from Spain to Portugal and maintain ecological flows during the year according to seasonal variability. The institutional setting has been improved with the creation of a joint permanent technical secretariat. An annex added to the Protocol specifies the exchange procedures for implementing strategic environmental assessment of cross-border effects. Portugal and Spain recently recognised the need to improve transparency between the two countries and to increase public participation in the development of management plans. Joint management of shared basins remains a challenge.

Portugal and Spain co-operate on *nature conservation and biodiversity*, with financial support from the EU. Further to the 19th Luso-Spanish Summit in 2003, a Memorandum of Understanding was signed between the countries' Ministries of Environment for co-operation on the Iberian lynx (*Lynx pardinus*) and the Imperial Eagle (*Aquila adalberti*). The Iberian lynx is classified as a critically endangered species by both countries and protected under the Bern Convention, CITES, and the EU Habitats and Species Directives. While the most recent information concerning this animal in the wild in Portugal dated from 2001, a radio tracking survey has shown that one adult male crossed the border from Spain to Portugal three times in 2010. Following a bilateral agreement in 2007 on a captive breeding programme (*ex situ*), 16 Iberian lynxes have been sent to the newly opened centre in the Algarve region, co-funded by the Algarve water company as a compensation measure for construction of the Odelouca dam. Notable success has been achieved in nature conservation with the Gerês-Xurés Transfrontier Park, which in 2009 was included in UNESCO's World Network of Biosphere Reserves (Box 4.1). Portugal and Spain are also

working jointly on the creation of the transboundary Tajo-Tejo International Park. The two countries co-operate on the protection of the *montados* ecosystem[15] through an Observatory for monitoring cork oak and holm oak stands created in 2003. In 2008, a joint research project ("Iberia Change") was launched to assess the potential impacts of climate change on Iberian biodiversity during the next 100 years. This project will help the two countries develop common strategies to mitigate these impacts.

Water, nature conservation, biodiversity conservation and climate change will continue to be priorities for co-operation between the two countries. Portugal is also looking at ways to share its experience in the areas of *water resources management, waste management* and *air* pollution with the Maghreb countries.

Water scarcity and drought, climate change, and biodiversity were the three environmental priorities of the Portugal's *EU Presidency* in the second half of 2007. In November 2006, a common agenda on biodiversity was agreed with Germany and Slovenia to ensure the consistency of the three countries' successive presidencies and prepare for the Conference of the Parties to the Convention on Biological Diversity (COP-9) in May 2008. Portugal has supported the development and adoption by the parties to the CBD of scientific criteria to identify priority areas for biodiversity conservation in marine areas beyond national jurisdictions. It has co-ordinated discussions at EU level regarding the Cartagena Protocol on Biosafety. Portugal has committed itself to, and laid the foundations for, European policy on water scarcity and drought. It was responsible for co-ordinating the EU position during the series of negotiations on climate change that culminated in the 2007 UN Climate Change Conference in Bali. The International Carbon Action Partnership (ICAP), a partnership of countries pursuing the development of carbon markets through implementation of cap and trade systems, was established in Lisbon in 2007.

Box 4.1. **Co-operation with Spain on nature conservation**

The Xurés-Gerês Transfrontier Park was created in 1997 through a co-operative agreement between Portugal's Institute for Biodiversity and Nature Conservation (ICNB) and the Xunta de Galicia (the executive branch of the Autonomous Community of Galicia, Spain), as part of broader co-operation by the Northern Portugal-Galicia Working Community. This park, which includes the Peneda-Geres National Park (northern Portugal) and the Baixa Limia-Serra do Xurés Nature Park (Galicia), covers areas included in the *Natura* 2000 network. The region in which it is located is subject to oceanic and Mediterranean climatic influences. It contains rich forest and peatland ecosystems and a large number of endemic species.

Many cross-border activities are taking place, including the monitoring of important animal populations. A number of projects benefit from EU funding. For example, under the European territorial co-operation programme for cross-border co-operation between Spain and Portugal (POCTEP 2007-13) the Natura Xurés-Geres project (EUR 2 million, of which EUR 1.5 million is provided by the EU) seeks to establish a joint management plan for the transfrontier park, with a strong emphasis on monitoring and restoring species and habitats.

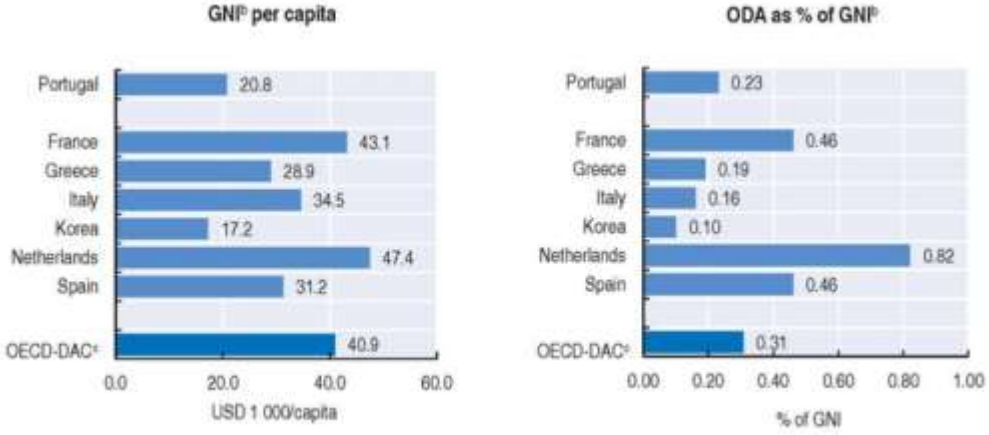
The park offers an excellent opportunity to promote tourism. Two airports (Porto and Vigo) provide easy access to tourists. A joint reservation and information centre is under development. The park was added to UNESCO's World Network of Biosphere Reserves in 2009. The reserve encompasses 11 municipalities in the two countries and covers 259 496 ha, of which three-quarters is in Portugal.

Source: Ministry of Environment and Spatial Planning.

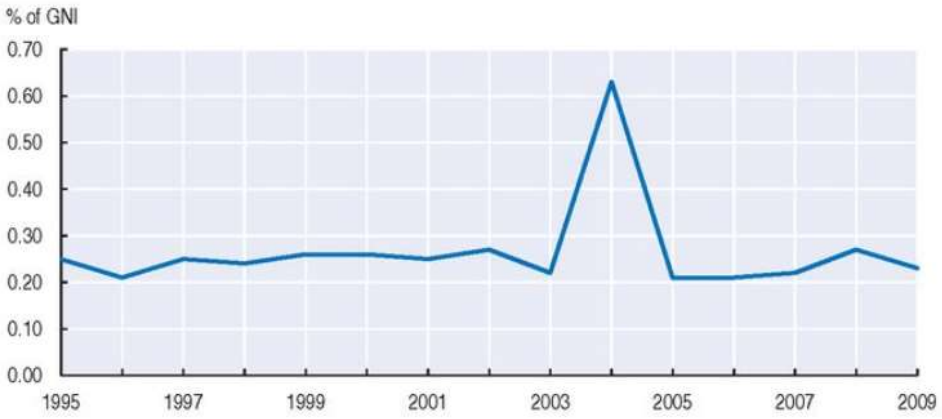
4. Official development assistance

Between 2000 and 2009, Portugal's net *official development assistance* (ODA) decreased slightly, reaching USD 507 million in 2009 or 0.23% of its gross national income (GNI). During the last decade, aid volume fell in 2003 and 2009, following efforts to control the budget deficit, and surged in 2004 due to rescheduling of Angola's debt (Figure 4.2). Portugal did not meet the EU target of 0.33% ODA/GNI in 2006. The projection for 2010 (0.34%) is well below the minimum DAC-EU donor target of 0.51%. Although the government has reaffirmed its commitment to reach 0.7% ODA/GNI in 2015, in view of its current fiscal situation, this objective appears very challenging.

Figure 4.2. **Official development assistance, 2009**[a]



ODA in Portugal as % of GNI,[b,d] 1995-2009



a) Preliminary data.
b) Gross national income in USD at current exchange rates.
c) Member countries of the OECD Development Assistance Committee.
d) 2004 data include the rescheduling of Angola's debt (USD 698 million or 0.5% of GNI).
Source: OECD (2010), *International Development Statistics Database.*

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Consistent with the Strategic Vision for Portuguese Co-operation approved by the Council of Ministers in 2005, Portugal has concentrated its ODA in *Portuguese-speaking countries*: the five PALOPS (Cape Verde, Mozambique, Angola, Guinea-Bissau, and São Tomé and Principe), all located in sub-Saharan Africa, and Timor-Leste in south-east

Asia. However, these countries' overall share has decreased in recent years, absorbing 53% of total bilateral ODA in 2007-08 compared to 84% in 2002-06. The main reason for this change is the line of credit granted by Portugal to Morocco in 2008. With Cape Verde attaining the status of a lower-middle-income country in 2008, the share of aid to least developed countries (LDCs) in bilateral ODA has been cut by half since 2000. Multilateral ODA has increased significantly during the last decade in both share and volume. Contributions to the EC budget, the European Development Fund and the International Development Association make up the bulk of Portugal's support to multilateral agencies, which accounted for nearly half of total ODA in 2009.

Although sustainable development[16] is defined as a priority sector in the 2005 Strategic Vision, *environment is not considered a priority for Portugal's development assistance*. It has remained at around 1% of bilateral ODA since the beginning of the decade. Such assistance is mainly provided in the form of technical co-operation. A number of training programmes on environmental inspections and impact assessment have been conducted in the PALOPS. Examples of projects related to climate change include quantification of carbon stocks and sinks in the forests of Guinea-Bissau and development of a Climate and Sea Information System for sustainable development in Cape Verde, Guinea-Bissau, and São Tomé and Principe. During the period from 2001-08, Portugal contributed USD 15 million to the Global Environment Facility (GEF) and USD 8 million to the Montreal Protocol (OECD 2006, OECD DAC statistics).

*Assistance for water supply and sani*tation (including waste management) is also below the DAC average, at just above 1% of bilateral ODA in 2004-05. It decreased recently as infrastructure projects in the PALOPS were completed. Nonetheless, imputed multilateral contributions to the sector have notably increased, mainly through EU institutions (OECD/WWC 2008). Portugal has joined the EU Water Facility Initiative. Through conferences of environment ministers of Portuguese-speaking countries (2001, 2006 and 2008), Portugal is the lead country along with Brazil for co-operation on water management and Mozambique for climate change matters. Activities have mostly consisted of training courses, financing meetings and information exchange.

Portugal is currently *revising its co-operation strategy*, with a view to strengthening activities concerned with environment, particularly those related to climate change and renewable energies. A National Strategy for Adaptation to Climate Change was approved by the Council of Ministries in April 2010. It includes a specific objective on international co-operation encompassing stronger support for adaptation measures in those countries most vulnerable to climate change, particularly among the PALOPS. In 2010, in the framework of the Copenhagen Accord, Portugal pledged EUR 36 million in fast-start financing to developing countries for adaptation and mitigation activities over 2010-12.

Box 6.1. **Aquaculture**

Aquaculture output stood at 7 893 tonnes in 2006, with total sales of EUR 43 million (OECD, 2009). Major species cultivated include oysters, clams, sea bream, sea bass and eel. The significance of clams and oysters is clear, with sales of EUR 20 million. Most aquaculture products are consumed domestically, with export sales making up only 6% of the total. Overall sales figures, when compared to the significant investments in aquaculture in the period prior to 2007, seem modest. However, some investments (notably in a turbot farm which is about to begin operations) will bring returns in the longer term.

Portugal's aquaculture is largely confined to offshore sites and estuaries. Almost 90% of aquaculture facilities are located in publicly domain areas, based on ten-year private concessions. The industry is characterised by a great deal of extensive farming, largely family-based. There has been a move to encourage aquaculture as an alternative for fishermen facing reduced fishing quotas.

Aquaculture in Portugal needs to address a number of significant problems, notably competition from intensive Spanish and Greek aquaculture, whose products are imported. The need to differentiate Portugal's product has acted as a driver for efforts to certify production, with many facilities considering becoming more ecological. The objective of national fisheries policy in regard to aquaculture is to increase production and product diversity, but also product quality, so as to improve the sector's competitiveness. In addition, structural modernisation is being promoted within the current fisheries management plan. These objectives are consistent with those established by the EU in the Common Fisheries Policy, particularly the 2002 Strategy for the Sustainable Development of European Aquaculture, which promotes environmental, economic and social sustainability. There has been significant investment in aquaculture in recent years. Over EUR 125 million, allocated between 2000 and 2006 under the EC's Directorate-General for Maritime Affairs and Fisheries (DG MARE) programme, focussed on investments in improving aquaculture operations. Under the 3rd Community Support Framework (CSF III), the emphasis has been on project analysis and environmental rules, including effluent treatment and the use of alternative energy sources and innovative technologies.

3.4. *Use of economic analysis and instruments*

Experience in some other OECD countries, especially France, Italy and Spain, suggests that coastal zone management would benefit from the application of *economic valuation techniques and economic instruments*. The former could help establish trade-offs among the many competing policy objectives involved in coastal zone management, while the latter could help internalise negative environmental externalities and establish appropriate prices and incentives for more environmentally sustainable practices. Very few economic instruments have been used in this way in Portugal. Further analysis of their potential application is warranted (Table 6.3).

One study showed that there was significant *willingness to pay for water quality improvements*, largely related to amenity and recreation effects (Machado, 2002). A 2009 case study showed that in central Portugal (Ovar-Marinha Grande) expected losses from ecosystem services would amount to one-fourth of the total value they provide every year (nearly EUR 200 million) (Alves *et al.*, 2009).[10] The analysis of ecosystem service losses from coastal erosion has already been used to develop the Coastal Protection Investment Support Tool (COPIST), which helps coastal zone managers to identify cost-effective locations for coastal protection work. Carrying out such studies, supplemented by the appropriate transfer of results from other countries to Portugal, should provide a useful basis for the use of analytical tools such as cost-benefit analysis in coastal zone management (Markandya *et al.*, 2008).

Regarding economic instruments, the introduction of *taxes or charges for a construction permit*, as for example in France, could generate revenues that could be invested in coastal

Table 6.3. **SWOT analysis of economic instruments for ICZM**

	Economic instruments to promote sustainable construction/ discourage illegal construction	Tourist eco-charges	Incentives for brownfield redevelopment
Strengths	• based on polluter pays principle • provides revenues for improving • coastal areas (if earmarked) reduces pressure on coast	• based on user pays principle • provides revenue for improving coastal areas may improve the attractiveness of resorts for "high quality" tourism	• provides incentives to remediate buildings • reduces pressure on greenfield sites
Weaknesses	• may be seen as a "carte blanche" for developments • collection costs may be significant if legal action is required	• opposition from tourism sector • compliance costs for industry	• cost to taxpayer to assist development
Opportunities	• rate of charges sets example to protect coastal area	• encouraging better quality tourism, leading to increased per capita expenditure	• improved quality of coastal building infrastructure
Threats	• setting rate of charge difficult: should not be set too high (no development) or too low • may be difficult to implement with pressure from significant stakeholders	• tourism under pressure from competitors; additional cost could reduce tourism demand and revenues • legislative barriers	• unexpected remediation expenditures • low uptake of subsidies affecting effectiveness

Source: OECD, Environment Directorate.

zone management, including nature conservation projects. They can also provide incentives for construction outside coastal areas.

Fines to discourage illegal construction have been used in Portugal. However, their effectiveness has been limited by the weak enforcement capacities of local authorities. Considering the extent of illegal construction in some areas, important efforts should be devoted to better enforcement of planning requirements as well as stricter application of fines. Closer co-operation between national authorities and the local population and NGOs should provide a way to exert pressure on local decision-makers to undertake non-compliance actions and ensure better transparency in their implementation. Fines could be extended to other illegal activities along the coasts, such as illegal extraction of natural resources.

Tourist eco-charges are another source of revenue that could be used to pay for environmental protection and thus promote a higher quality of tourism. However, there may be potential barriers to their implementation in terms of perceived threats to competitiveness and the institutional framework – including the legal basis for regional eco-taxes of this type. For example, these measures were applied briefly in Mallorca, Spain, but met substantial opposition due to a perceived threat to competitiveness and difficulties with the legal framework for such measures in that country. Studies that evaluated the potential for such an economic instrument in the case of Hvar in Croatia found that tourists were willing to pay such a tax for environmental improvements in tourism destinations, although here again there were institutional barriers to the creation of this type of instrument (Taylor *et al.*, 2005).

Higher taxes on *greenfield development*, combined with tax incentives to promote brownfield redevelopment, would provide another means to reduce pressures from new construction in coastal areas. (Thornton *et al.*, 2007). A review of incentive schemes in Europe concluded that there is a need for further direct and indirect financial incentives for brownfield redevelopment, as it has higher costs than development on greenfield sites so that there is a rationale for relative fiscal incentives. Such incentives have been used successfully in a range of countries to reduce urban sprawl and protect green areas (Alberini *et al.*, 2003).