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ENVIRONMENT-ECONOMY INTERFACE*

Features

- Economic performance and environmental pressures
- Governance for sustainable development
- Environment and energy
- Integration of environmental concerns in fiscal policy
- National environmental planning
- Environmental policy instruments
- Environmental management in enterprises
- Environmental expenditure

* This Chapter reviews progress in the last ten years, and particularly since the 2000 OECD Environmental Performance Review. It also reviews progress with respect to the objectives of the 2001 OECD Environmental Strategy. It takes into account the latest Economic Surveys of Ireland and the latest IEA energy review of Ireland.

Recommendations:

- finalise the revision of the *National Sustainable Development Strategy*, make it fully operational with the introduction of targets, indicators and monitoring mechanisms, and assure consistency between it and existing sectoral policy frameworks;
- phase out *environmentally harmful subsidies* (e.g. for electricity generation from peat and for domestic aviation) and tax concessions (e.g. on coal and on fuel oil used by households and farmers) that create economic distortions and social inequity;
- replace some current taxes with appropriate environmentally related fiscal measures in the framework of a *comprehensive environmental tax reform*;
- realise the opportunities that have been identified to further improve *material productivity and energy efficiency cost-effectively*, for example in the residential, tertiary and transport sectors;
- maintain the *commitment to meet the objectives* in the main environmental policies and programmes, in spite of the difficult economic context, by increasing cost-effectiveness of environmental policies and providing adequate funding for environmental infrastructure;
- maintain recent efforts towards harmonisation of Irish *environmental legislation* with EU directives and promote implementation, particularly regarding environmental impact assessment;
- consider how best to *consolidate environmental regulations into a coherent framework* with the aim of simplifying and clarifying requirements and promoting better compliance;
- in the context of the ongoing review of local governance, examine the *environmental responsibilities of different administrative levels* to identify opportunities for better co-ordination, economies of scale and improved policy development and implementation, e.g. as regards provision of water services and establishment of waste management infrastructure;
- review the Irish National Roadmap for the Implementation of the EU Environmental Technologies Action Plan, building on current initiatives, with a view to strengthening *incentives for eco-innovation*.

Conclusions

Integrating environmental concerns into economic decisions

From 2000 to the second half of 2008, Ireland enjoyed sustained and rapid economic growth. In this period, Ireland made progress in *decoupling* environmental

pressures from economic trends, especially for transboundary air pollutants; CO₂ emissions increased, but at a lower rate than GDP (relative decoupling). *Energy intensity* was considerably reduced, and is now the lowest in the OECD. Material intensity also steadily decreased, reaching the OECD average. These changes were closely linked with the restructuring of the economy towards sectors with low energy intensity and high added value. Governance for *sustainable development* was consolidated. Since 1999, Comhar, the Sustainable Development Council, has served as a multistakeholder forum providing independent advice to the government. The National Development Plans for 2000-06 and 2007-13 have contributed to Ireland's progress in areas such as public transport and environmental infrastructure. Several mechanisms have been regularly used to *integrate environmental considerations in decision-making* at macro and micro levels, including SEA and regulatory impact analysis. Concerning *energy*, measures have been taken to promote the use of renewables and to assist businesses and households in improving energy efficiency. Ireland is on track to achieve the EU and domestic targets on renewable electricity by 2010. Some environmentally related taxes were introduced or revised in the 2009 fiscal package designed to respond to the economic crisis. The vehicle registration tax and annual motor tax were restructured on the basis of CO₂ emission levels.

However, further measures are needed to make economic development and environmental protection more mutually supportive. The growth of energy consumption in the transport, residential and tertiary sectors has resulted in *CO₂ emissions per capita* well above the OECD Europe average. *Waste generation per capita* is among the highest in the OECD and continued to grow during the review period. Despite the decrease in total consumption of *nitrogenous fertiliser*, the intensity of use (per unit of agricultural land) is well above the OECD Europe average; meanwhile *pesticide* use increased. The National Sustainable Development Strategy has lost momentum; progress on *implementation* has not been constantly monitored. There is a need to *integrate further environmental concerns* into sectoral policies and practices, particularly in land use planning, agriculture and transport, and to enhance implementation capacity at local level. *Transport trends* are of concern, with a dramatic increase in road transport for both freight and passengers. Concerning *energy*, there is scope to implement targeted demand-side measures to achieve additional energy savings. *Tax rates on energy products* are relatively low compared to other OECD countries and have not been adequately adjusted to inflation. There is scope to eliminate various *energy tax exemptions* and *environmentally harmful subsidies*, namely for electricity generation from peat and for domestic aviation, as well as to better target *transport-related taxes and prices* on vehicle use (fuel taxes and road pricing). Measures along these lines could help relieve pressures on the public budget and form part of the response to the economic crisis.

Strengthening the implementation of environmental policies

Ireland's environmental planning framework expanded significantly during the review period. Well-defined, ambitious objectives were established and efforts made to provide the means to achieve them. *Ireland's regulatory framework* was upgraded and brought into closer conformity with EU requirements. The 2003 *Protection of the Environment Act* strengthened regulation of activities most harmful to the environment and extended the scope of licensing to meet EU requirements for integrated pollution prevention and control (IPPC). *Other areas of legal reform* included biodiversity and wildlife protection, strategic environmental assessment (SEA), and air, waste and water management. The main *government agencies dealing with the environment* – the Department of the Environment, Heritage and Local Government (DoEHLG) and the Environmental Protection Agency (EPA) – enlarged their portfolios and staffing. The Environmental Enforcement Network, established in 2003, provides a mechanism for concentrating resources and promoting co-ordination and coherence across administrative divisions. *Economic instruments* have been introduced, especially in the waste sector. The revenue they generate supports infrastructure development and compliance promotion campaigns through the Environment Fund. *Voluntary approaches* by business and industry, especially regarding air and waste, have led to increased recycling, reduced air pollution and the promotion of eco-innovation and energy efficiency.

However, Ireland continues to face some implementation problems, in particular regarding surface and groundwater quality, waste management, and nature and biodiversity protection. The *lack of enforcement capacity in smaller municipalities* has been an important impediment. In spite of recent accelerated efforts, more needs to be done to *harmonise the environmental regulatory framework with EU legislation*. The environmental legal system lacks coherence. The European Court of Justice (ECJ) has delivered judgements against Ireland for not transposing EU regulations into national law and for otherwise failing to meet EU requirements. In 2006, the number of procedures brought by the European Commission against Ireland for infringing EU environmental directives was among the highest in the EU. Particular problems have involved the application of environmental impact assessments (EIAs) for projects in sensitive areas. The use of *economic instruments* has not been extended in the water sector, which relies on state budget transfers for investment and operations. Further opportunities for market-based approaches exist in air, biodiversity and waste management. More could be done to promote *environmental management in enterprises*, especially small and medium-sized companies. *Public expenditure for environmental protection* has increased significantly, but still represents a relatively small share of GDP. While a large part of Ireland's public environmental expenditure takes place at local level, local authorities have limited

fiscal autonomy. The *economic crisis* and large budget deficit impose serious constraints on government action and put at risk Ireland's ability to meet its environmental commitments.



1. Sustainable Development

1.1 *Decoupling environmental pressures from economic performance*

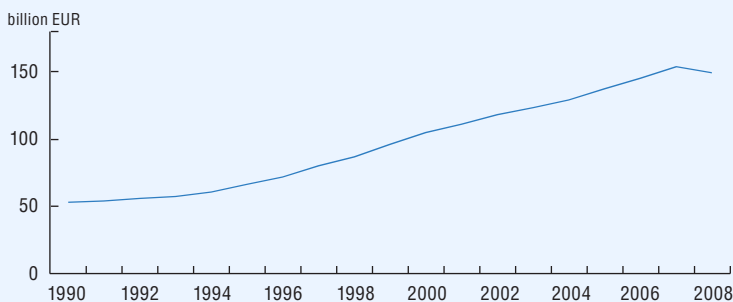
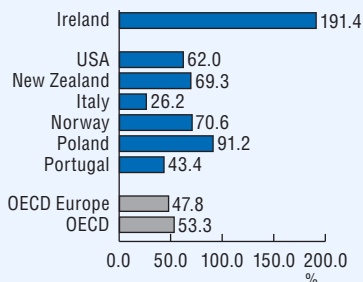
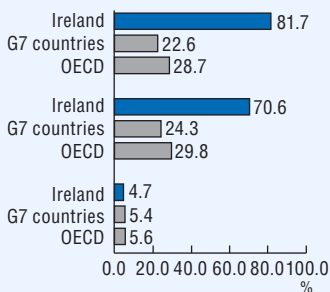
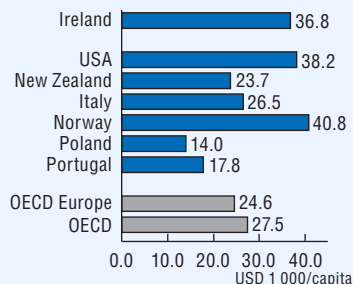
Economic growth and structural change

Between 2000 and 2007, Ireland *sustained the high economic growth* initiated in the mid-1990s: GDP growth averaged nearly 6% annually, well above the OECD and euro area rates. Once among the least developed Western economies, with high levels of emigration, since 2003 Ireland has enjoyed the third highest per capita GDP in OECD Europe (Figure 6.1).¹ The growing economy attracted an inflow of foreign workers; the unemployment rate was 4.7% in 2007, below the OECD average. In the first half of the 2000s, large public sector deficits were transformed into substantial surpluses and the ratio of national debt to GNP was greatly reduced, while the tax-to-GDP ratio remained low (31.9% of GDP in 2006, compared with an OECD Europe average of 38%).

Several factors contributed to this outstanding performance, including a series of triennial agreements between the government, trade unions and employers' organisations (the Irish Social Partnership Agreements, first launched in 1987), which brought wage moderation in return for income tax cuts. The combination of a low corporate tax (12.5%), state grants and access to the European single market boosted foreign direct investment. During the 1990s Ireland also benefitted from net EU transfers of about 4% of GDP, although EU funding significantly decreased in the 2000s, down to 0.4% of GDP in 2007. Membership in the European Monetary Union (since 2001) brought stable, low interest rates, which spurred the retail and housing markets. Significant investment in infrastructure and education enabled Ireland to take advantage of the growth opportunities made possible by the opening of its economy.

Ireland has a small and open economy, with *international trade* accounting for a larger part of GDP than in most OECD countries (Figure 6.1). The *structure of the economy* has changed dramatically since 1990. In particular, agriculture's share of

Figure 6.1 Economic structure and trends

GDP^a in Ireland, 1990-2008GDP^b growth, 1990-2007GDP^b per capita, 2007

Exports as % of GDP, 2008

Imports as % of GDP, 2008

Standardised unemployment rates,^c 2007

a) GDP at 2000 prices.

b) GDP at 2000 prices and purchasing power parities.

c) % of civilian labour force.

Source: OECD (2008), *OECD Economic Outlook No. 84*; CSO (2009).

Table 6.1 Economic trends and environmental pressures

(% change)

| | 1990-2007 | 2000-07 |
|--------------------------------------------------------|-----------------|-----------------|
| Selected economic trends | | |
| GDP ^a | 191 | 47 |
| Population | 24 | 14 |
| GDP ^a /capita | 135 | 28 |
| Agricultural production | 7 ^g | 1 ^g |
| Industrial production ^b | 365 | 44 |
| Road freight transport ^c | 273 | 55 |
| Passenger car transport ^d | 135 | 40 |
| Selected environmental pressures | | |
| Pollution | | |
| CO ₂ emissions from energy use ^e | 45 ^g | 9 ^g |
| Emissions of SO _x | -70 | -61 |
| Emissions of NO _x | -6 | -14 |
| Energy | | |
| Total primary energy supply | 50 | 9 |
| Total final consumption of energy | 69 ^g | 19 ^g |
| Energy intensity ^f | -48 | -26 |
| Resources | | |
| Municipal waste | 130 | 49 |
| Nitrogenous fertiliser use | -7 ^h | -7 ^h |
| Pesticide use | 62 ⁱ | 37 ⁱ |

a) At 2000 prices and purchasing power parities.

b) Mining and quarrying, manufacturing, and production of electricity, gas and water.

c) Based on values expressed in tonne-kilometres.

d) Based on values expressed in passenger-kilometres.

e) Excludes international marine and aviation bunkers; sectoral approach.

f) Total primary energy supply per unit of GDP.

g) To 2006.

h) To 2005.

i) To 2003.

Source: OECD, Environment Directorate; OECD-IEA.

GDP fell from 8.9% in 1990 to 1.7% in 2007, reflecting structural adjustment in the context of the EU Common Agricultural Policy reform. Industrial production has more than tripled since 1990 (Table 6.1), but its share of GDP has slightly decreased, as the service sector has grown. In 2008, eco-industry, mainly pollution management, contributed 1.5% to GDP and 0.3% to total civilian employment.²

Economic downturn

Ireland's economy sharply slowed in 2008, however, due to the collapse of the construction sector, reduced private consumption and weak exports linked to the international economic downturn. The country has been losing competitiveness in recent years as wages and prices have risen (OECD, 2008a). In 2008, Ireland's economy experienced its first full year contraction since 1983, shrinking by 3%. GDP further declined by over 8% in the first half of 2009. Tax revenue dried up and left the public sector with a 2008 deficit of 5.6% of GDP, much of it structural. Projections in the April 2009 budget suggested the deficit could reach 10.7% and unemployment 12.6% in 2009. The interest rates on Irish public bonds are among the highest in the euro area. Strong action stabilised the banking system in late 2008. Irish financial institutions remain fragile because they hold large amounts of property loans.

While in 2008-09 most OECD countries adopted expansionary fiscal measures, there was very limited scope for fiscal stimulus in Ireland. The economic crisis and deteriorating public finances forced the government to *drastically tighten its budget* in a bid to restore confidence among foreign investors and at home. As of June 2009, the net cumulative impact of the fiscal measures adopted for 2008-10 was estimated at 8.3% of 2008 GDP, including tax revenue increases and spending cuts (OECD, 2009a). The tax increases target personal income and consumption. Some *fiscal measures* introduced in 2009 are environmentally related, such as an air travel tax and increases in vehicle and road fuel taxation. *Public spending* has been cut in virtually all areas, including environment, transport and overseas development aid. Exceptions include water infrastructure (Water Services Investment Programme), sustainable energy, and energy efficiency of buildings (Home Energy Saving Scheme and Warmer Homes Scheme). Given the openness of the Irish economy, it is likely that the domestic consequences of the world recession will be largely corrected by a world recovery. On the other hand, structural reforms are needed to improve competitiveness and restore public finances. In this respect, the 2009 budget package seems an appropriate fiscal policy response.

In December 2008, the government launched “Building Ireland’s Smart Economy – A Framework for Sustainable Economic Renewal” as its strategy for addressing the economic crisis and restructuring the economy for a new development phase. The “smart economy” is an *innovation-based, green and low-carbon economy* that moves away from fossil energy and invests in low energy-intensive and low material-intensive manufacturing. The framework builds on existing policies, including the white paper on energy policy. It envisages, among other things, environmental tax reform and the development of statistical measures of sustainable development. As promised in the framework, a high-level group was established to formulate an action plan for developing environment-related business activities. As

part of the government recapitalisation programme for financial institutions, also announced in December 2008, Ireland's two biggest banks are to invest EUR 100 million each to support "environment-friendly investments", with a view to reducing energy consumption and boosting renewables. The crisis represents a challenge for maintaining environmental commitments. It also presents opportunities to *reassess and reform policies that are both economically costly and environmentally damaging*, such as energy-related subsidies and tax concessions, and subsidies to environmentally harmful agricultural production.

Pollution intensities

In a context of rapid economic growth, SO_x and NO_x emissions decreased by 61% and 14%, respectively (Table 6.1), owing mainly to gradual fuel switching (from oil, coal and peat to natural gas for both electricity generation and household consumption), improved power plant efficiency and the introduction of more stringent standards and voluntary agreements on fuel quality. Emission intensities decreased further during the review period and are now below (SO_x) or in line with (NO_x) the OECD Europe averages, showing a strong decoupling from GDP growth and fossil fuel use (Chapter 2). Nevertheless, per capita emissions of NO_x remain higher than the OECD Europe average.

CO_2 emissions from energy use declined slightly in the early 2000s because of changes in the economic structure (a shift from energy-intensive industry to light industry) and fuel mix, as well as some improvement in the energy transformation sector (e.g. upgrading of peat-fired power plants). However, in the second half of the 2000s, emissions have been increasing at the same pace as energy consumption, albeit at a lower rate than GDP, leading to 8.5% growth overall since 2000 (Table 6.1). Emissions per unit of GDP have decreased significantly since 1990 and are now just below the OECD Europe average. Despite the slight decrease, CO_2 emissions per unit of primary energy supply remain the fourth highest in the OECD, mainly due to high fossil fuel dependence. CO_2 emissions per capita have increased significantly and are well above the OECD Europe average, reflecting increases in GDP per capita and growing fuel consumption for transport (Chapter 8).

Energy intensity

During the review period, *total final consumption (TFC) of energy and total primary energy supply (TPES)* continued to increase, though less than GDP, industrial production and road transport (Table 6.1). Ireland's energy intensity (TPES per unit of GDP) has been decreasing steadily and in 2007 was 0.10 tonne of oil equivalent (toe) per USD 1 000, the lowest in the OECD. The restructuring of the Irish economy towards economic sectors with high added value and low energy

intensity, and increased efficiency in electricity generation, have been the major drivers of this impressive downwards trend (IEA, 2007).

Resource intensities

Total *water withdrawals* by public water supply increased by 14% between 2002 and 2005, although few groundwater and surface water bodies are at risk from significant abstraction (EPA, 2005).³

Apparent *consumption of nitrogenous fertiliser* decreased by 7%, but Ireland's use of such fertiliser per square kilometre of agricultural land is well above the OECD Europe average. As regards *pesticides*, although consumption has steadily increased (by 37%), the intensity of pesticide use (0.07 tonne/km² of agricultural land) is lower than the OECD Europe average and among the lowest in the OECD (Chapter 3).

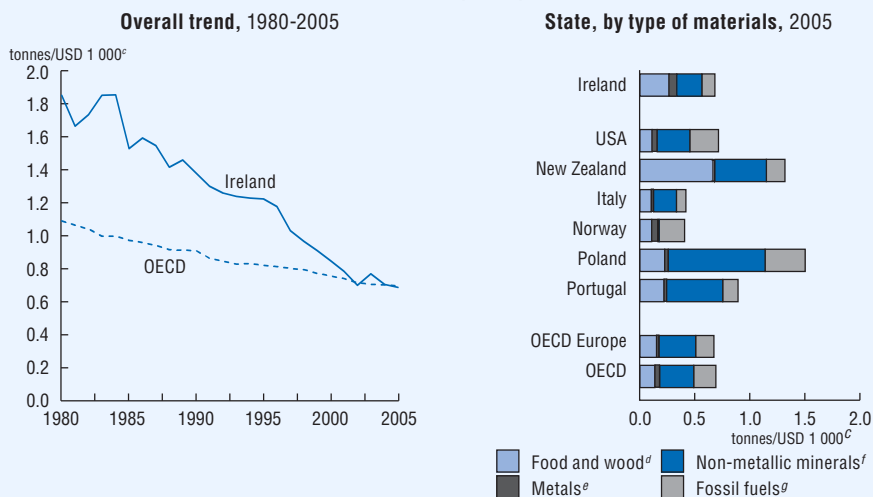
Generation of *municipal waste* continued to grow during the review period (by 49%), steadily coupled with private final consumption. The generation of waste per capita (780 kg) is the third highest in the OECD (Chapter 4). Moreover, the vast majority of municipal waste is still disposed of in landfills.

Overall domestic material consumption (DMC)⁴ has risen by 35% since 1980, reflecting the rapid economic growth. However, Ireland's *material intensity*, as measured by DMC per unit of GDP, has decreased dramatically and is now at the OECD average (Figure 6.2). Food, feed and wood materials account for over 36% of overall material intensity (compared to nearly 16% for the OECD as a whole), reflecting the weight of agriculture in Ireland. While mineral intensity is relatively low by OECD standards, DMC of non-metallic minerals has substantially increased since 1990, reflecting the construction boom. The restructuring of the industrial sector and the efficiency gains in electricity generation helped further reduce fossil fuel intensity from 0.16 tonne/USD 1 000 in 2000 to 0.12 tonne/USD 1 000 in 2005, and it is now below the OECD Europe level of 0.17 tonne/USD 1 000.⁵

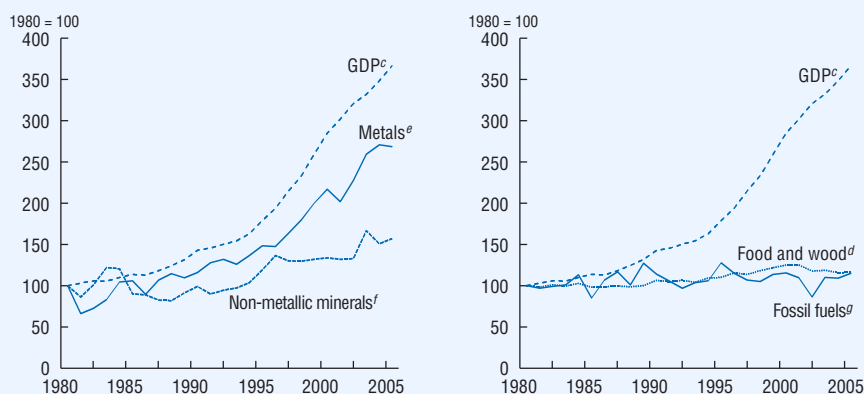
1.2 Governance for sustainable development

Since the late 1990s, Ireland has made progress in *mainstreaming sustainable development goals* in general government and sectoral policies. The latest ten-year *Social Partnership Agreement*, “Towards 2016”, explicitly acknowledges that “environmental challenges have profound implications for the future, including for economic performance”. It commits the government to review the Irish strategy for sustainable development. *Programmes for Government* adopted during the review period included environment-specific priorities. The 2002-06 Programme for Government committed to gradually phase in a greenhouse gas taxation policy taking

Figure 6.2 Material intensity^a
Domestic material consumption^b per unit of GDP^c



Domestic consumption by type of materials, 1980-2005



- The material intensity of an economy can be measured as unit of domestic material consumption (DMC) per unit of GDP. A decline in material intensity is equivalent to a rise in material productivity (*i.e.* GDP/DMC).
 - DMC is the sum of domestic (raw materials) extraction used by an economy and its physical trade balance (imports minus exports of raw materials and manufactured products).
 - GDP at 2000 prices and purchasing power parities.
 - Domestic production from agriculture, forestry and fisheries, plus trade of raw and processed products from these sectors (*e.g.* cereals, live animals, foodstuff, feedstuff, pulp and paper, processed wood, fuel wood, biofuel).
 - Domestic extraction of metal ores, plus trade of metal ores (*e.g.* bauxite), metal concentrates (*e.g.* nickel matte), refined metals (*e.g.* steel, aluminium, copper), products mainly made of metals (*e.g.* vehicles, machinery, electronics and electrical equipment), and scrap.
 - Domestic extraction and trade of minerals used in industry (*e.g.* salts, potash, phosphate rocks) and construction (*e.g.* sand, gravel, stones), plus trade of derived processed products (*e.g.* cement, glass).
 - Coal, crude oil, natural gas, peat and traded derived products (*e.g.* plastic and rubber).
- Source: OECD (2008), OECD Pilot Material Flow Database.

into account the balance among economic, social and environmental objectives. The 2007-12 Programme for Government reiterated this commitment and made climate change one of three top political priorities (together with infrastructure development and health care).

The Sustainable Development Council

Since 1999, Comhar, the Sustainable Development Council, has provided significant input on a number of major policy issues, such as the revision of the National Sustainable Development Strategy (Box 6.1) and the design of a carbon levy (Chapter 8). Comhar's 25 members come from a range of environmental NGOs, social NGOs, business sector organisations, the professions, academia and public sector bodies. The government approves the council's terms of reference. The minister for the environment, heritage and local government appoints the chairperson and members for three-year terms. The chairman of the Joint Oireachtas (Parliament) Committee on Environment and Local Government is a member *ex officio*. Comhar is financed through the Environment Fund and supported by a full-time secretariat.⁶

Comhar serves as a discussion forum that facilitates broad debates on sustainable development issues between the government and interest groups. The council meets regularly and works in three-year cycles; working groups deal with many of its work programme objectives.⁷ Comhar undertakes work at the request of any minister or on its own initiative. It provides *i*) advice to the government, *ii*) opinions and recommendations on policy development, *iii*) research and reports, and *iv*) sponsorship, conferences, seminars and other awareness-raising efforts. It submits its reports and other outputs to the minister for the environment, heritage and local government, who refers them as appropriate to the Cabinet, the Oireachtas Committee on the Environment and Local Government, government departments and other bodies.

Other institutional arrangements

Interdepartmental co-operation regarding sustainable development reached the highest political level in the case of climate change and energy with the establishment of the *Cabinet Committee on Climate Change and Energy Security*. The committee is supported by an interdepartmental subcommittee at senior level. While the committee does not have direct decision-making power, it formulates proposals to the Cabinet for further action. Several institutions are involved in formulating and delivering the government's policy on energy and climate issues, with a strong emphasis on cross-sectoral and cross-departmental co-ordination (Box 6.2).

Box 6.1 Selected Comhar recommendations for the revised National Sustainable Development Strategy

- The *annual review of progress* on climate change should provide an assessment against specified benchmarks (including the annual 3% cut in emissions foreseen in the Programme for Government 2007-12) and a clear timetable for policy measures.
- *All new fiscal measures should be carbon-proofed* to ensure that they do not drive a rise in greenhouse gas emissions and other pressures on the environment, but rather encourage emission reductions.
- The NSDS should provide a clear signal that *land use planning and transport planning* will be fully integrated and propose concrete ways that these policy areas can be integrated.
- The *shift towards charging* all users for the full social, economic and environmental cost of transport infrastructure, including congestion charging, should take into account the availability of public transport options and the social justification for public transport.
- A shift to more *environment-friendly fuels*, e.g. biofuels, should be encouraged in public transport, government vehicles and other captive fleets, with full regard to the social and environmental impact of such alternative fuels.
- The NSDS should commit to the adoption of a national *sustainable consumption and production action plan* within two years, including the development of clear guidance for the integration of sustainable development criteria into all public procurement decisions.
- The NSDS should commit to the review and strengthening of the *National Biodiversity Plan* by mid-2008, including measurable targets and indicators in line with Convention on Biodiversity guidance.
- *Compliance with relevant environmental quality standards*, e.g. for drinking water, needs to be assured.
- The NSDS should reiterate the key commitments in the *National Action Plan for Social Inclusion 2007-16* and include an ambitious target for reducing the number of people at risk of poverty.
- The NSDS should reaffirm Ireland's commitment to the *Millennium Development Goals* and to raising its volume of official development assistance (ODA) to 0.7% of gross national income by 2012.
- Separate from ODA funding, the government should investigate the possibility of investing in specific projects under the *Kyoto Protocol's Clean Development Mechanism* that meet minimum social and environmental standards.
- The revised NSDS should give full consideration to *reforms of local government funding and taxation*.

Box 6.1 Selected Comhar recommendations for the revised National Sustainable Development Strategy (*cont.*)

- RIA methodologies for policy development should be reviewed in the light of best practice on sustainability impact assessment.
- The government should promote *coherence and complementarity* between the revised NSDS and other national policy strategies.
- The NSDS should reiterate a general principle of *support for macroeconomic and fiscal measures* that encourage more sustainable behaviour, *e.g.* through extension of the “polluter pays principle”, phasing out of environmentally harmful subsidies and greening of public procurement.
- An appropriate set of *sustainable development indicators* should be published with the revised NSDS to provide a basis for measuring progress on sustainability and a means of effectively communicating this to the general public.

More informally, there is *regular co-operation at official level between the main government departments and agencies* on a range of environmental and sustainable development issues, including infrastructure development, water quality and sustainable transport. However, the co-operation between environmental institutions and other sectoral authorities appears more effective for some sectors, such as energy, than for others, such as transport, land use and agriculture. Co-ordination between central government departments and local authorities has proved difficult; few resources are allocated to communities to participate in policy-making and implementation. The Irish Public Service⁸ remains segmented in dealing with environmental issues, as it is for other policy fields, so there is little coherence in policy development (OECD, 2008b). It will be critical to review and adapt the structures through which sustainable development policies and strategies are delivered.

Mechanisms to integrate sustainable development into decision-making

In 2000, Ireland introduced *strategic environmental assessment* (SEA) through the Planning and Development Act, thus anticipating the EU SEA Directive (2001/42/EC). The Act required that several spatial plans (*e.g.* regional planning guidelines, development plans, local area plans and strategic development zone plans) include sustainable development objectives and be accompanied by information about their likely significant effects on the environment. The 2004 Planning and Development

Box 6.2 The energy sector: Institutions and inter-institutional co-ordination

Several *government institutions and agencies* are involved in formulating and implementing energy-related policy. The Department of Communications, Energy and Natural Resources leads the government's action on energy matters; energy taxation is a responsibility of the Department of Finance, and the DoEHLG oversees climate change policy.

The *Commission for Energy Regulation* is the independent regulatory authority for the electricity and gas markets. It oversees the operation, maintenance and licensing of the transmission and distribution networks, promotes competition in the markets and sets the regulated prices charged to customers by the state-owned Electricity Supply Board and Board Gáis Éireann. The commission is funded by a levy on energy enterprises and licensing fees. Environmental licensing responsibility of energy producers lies with the *EPA*.

Sustainable Energy Ireland, established in 2002, is the national energy agency and is funded by the National Development Plans. Its mandate is to promote and assist the development of sustainable energy in Ireland. Its responsibilities include *i*) assisting the government with implementation of the *energy white paper*; *ii*) promoting policies and measures on energy efficiency, renewable energy sources and combined heat and power; *iii*) promoting the mitigation of environmental impacts of energy generation and use, including greenhouse gas emissions, and contributing to implementation of the National Climate Change Strategy (2007-12); *iv*) conducting awareness raising and producing information; *v*) issuing energy statistics, projections and monitoring; and *vi*) carrying out research and development.

A particular emphasis is placed on a “*whole-government*” approach to energy and climate issues. At Cabinet level, energy issues are discussed by the Cabinet Committee on Climate Change and Energy Security, which is supported by an interdepartmental group at senior official level chaired by the Department of the Taoiseach (Prime Minister). Other interdepartmental groups are: the Technical Analysis Steering Group (chaired by the DoEHLG), the Renewable Energy Development Group (chaired by the DoCENR) and the Ministerial Bioenergy Taskforce. The *Irish Energy Research Council*, launched in 2006, works as an advisory body and comprises leading academics, government officials and representatives of the energy industry. It coordinates energy research and development activities in Ireland. The Council prepared the Irish Energy Research Strategy 2008-13 at the request of the DoCENR; Sustainable Energy Ireland is the main implementing body of the strategy.

Regulations fully incorporated the directive's requirements in the spatial planning system. The 2004 Environmental Assessment of Certain Plans and Programmes Regulations extended SEA to the plans of other sectors listed under the SEA Directive. The Department of the Environment, Heritage and Local Government

(DoEHLG) and the Environmental Protection Agency (EPA) provide technical support (in the form of guidelines, checklists and web-based tools) to regional and planning authorities on SEA implementation.

An increasing number of SEAs have been carried out. Consultation procedures have been strengthened; the EPA, the DoEHLG and the Department of Communications, Energy and Natural Resources (DoCENR) are the statutory environmental authorities that need to be consulted during assessment. However, as in many countries, there is little evidence concerning the *influence of SEA on decision-making* or on environmental quality and overall sustainability of plans (Scott, 2005). In line with the directive, Irish SEA focuses on environmental sustainability rather than on sustainable development, and is not integrated in a wider sustainability appraisal as in the United Kingdom.

Since June 2005, *regulatory impact analysis* (RIA) has been required for all proposals of primary legislation, significant secondary legislation and all EU legislative proposals. It should assess all impacts of a proposal, including environmental and unintentional ones, and allow for stakeholder consultation.⁹ Some 74 RIAs were produced between June 2005 and February 2008, and more than 800 officials underwent training to do RIA, leading to a significant increase in quality. An *independent review of the RIA operation*, committed to in the Social Partnership Agreement “Towards 2016”, was published in July 2008. It indicates good progress overall on RIA, and identifies areas for further progress. In particular, it suggests that visibility and dissemination of RIAs should be improved, along with management and cross-departmental co-ordination, especially for RIAs of EU legislation. The government agreed to act on the recommendations in the report and revised the RIA guidelines accordingly.

1.3 National Sustainable Development Strategy

Implementation of the first National Sustainable Development Strategy

Ireland’s first National Sustainable Development Strategy (NSDS), “*Sustainable Development: A Strategy for Ireland*”, dates back to 1997. It drew attention for the first time to integration of the environmental dimension into sectoral policies, and laid down co-ordination arrangements across the Oireachtas and the administration. These included establishment of the Oireachtas Sub-Committee on Sustainable Development and of the Environmental Network of Government Departments (chaired by the DoEHLG).

A 2002 report, “*Making Ireland’s Development Sustainable*”, assessed the NSDS after five years and served as Ireland’s national report to the Johannesburg

World Summit on Sustainable Development. It described the pressures associated with economic growth, changing population, settlement and consumption patterns, and underdeveloped environmental infrastructure, and acknowledged that integration of economy and environment in Ireland had not yet been fully addressed (DoEHLG, 2002). The report also set out broad policy goals for the decade: *i*) keeping the economy competitive in a rapidly changing world, including by greater eco-efficiency; *ii*) providing a strong basis for further economic prosperity; *iii*) bringing about a fairer and more inclusive Ireland; *iv*) promoting and securing a high-quality environment; and *v*) contributing to global sustainable development. Climate change, nature and biodiversity, environment-related health issues (including air and water quality) and waste management were identified as the key policy priorities. A strong focus was put on eco-efficiency and “working with the market”, *i.e.* reinforcing the role of economic and fiscal instruments in the policy mix.

The 2002 review was not followed up. As a result, the strategy has lost momentum and influenced policy-making only to a limited extent.¹⁰ Progress on *NSDS implementation* has not been constantly monitored due to a lack of well-defined assessment procedures and quantified objectives in policy areas other than environment. The Central Statistics Office maintains a data series, “Measuring Ireland’s Progress”, which includes more than 100 indicators on social, economic and environmental themes, but it is not directly linked to NSDS monitoring. After a number of years of activity, the Environmental Network of Government Departments has remained virtually idle. Although regional authorities were required to define regional sustainability priorities, implementation mechanisms and indicators in the framework of the NSDS, they have not done so (Comhar, 2007).

Revision of the strategy

Following the adoption of a revised EU Sustainable Development Strategy in June 2006, “Towards 2016” committed the government to develop a *renewed NSDS* by 2007. Although its preparation has not yet been completed, the new strategy is intended to be consistent with that of the EU while tailored to Ireland’s national circumstances. The DoEHLG is responsible for co-ordinating the revision. An *ad hoc* high level interdepartmental group has been established to assure interdepartmental co-ordination and oversee the process of moving towards a new NSDS.

The DoEHLG has provided financial support to environmental NGOs to facilitate their participation in the revision process. *Stakeholder participation* has been assured through Comhar, which in 2007 engaged in wide-ranging stakeholder consultations and held consultation workshops in Dublin, Cork and Sligo. The output of the workshops helped inform the council’s contribution to the NSDS. Comhar made several recommendations, which are broadly in line with the OECD

environmental *acquis* and deserve consideration (Box 6.1). As the council suggested, effective delivery of the revised NSDS will require leadership at the highest level of government and engagement with key sectoral interests and civil society. Moreover, the high level interdepartmental group should continue to oversee the implementation of the strategy after its adoption.

1.4 *The environmental dimension of national investment plans*

The National Development Plan (NDP) is the principal *strategic framework for public investment*. The NDPs for 2000-06 and 2007-13 took account of the environmental sustainability principle, both directly, with investment in environmental infrastructure, and indirectly, as a guiding principle for NDP implementation and project selection. An Environment Co-ordinating Committee, established for the former NDP, included representation from managing departments, social partners, environmental NGOs, Comhar, the EPA and the European Commission. Its mandate was to promote and co-ordinate environmental integration across programmes and report to the NDP monitoring committee. Comhar and the EPA have been full members of the NDP monitoring committees in both programming periods.

Programming period 2000-06

The *NDP 2000-06* aimed at continuing sustainable national economic and employment growth, consolidating and improving Ireland's international competitiveness, fostering balanced regional development and promoting social inclusion. It allocated about EUR 57 billion of public funds, mainly from the Exchequer, for major investments in infrastructure, health services, social housing, education, industry and rural development.¹¹ The plan consisted of seven programmes: four national, two regional and one cross-border.

The national programmes on economic and social infrastructure supported investment in *environmental infrastructure* (almost exclusively in the water sector), which accounted for 5.5% of overall planned NDP expenditure. Investment in the water and waste sectors, mainly for rural areas, were also supported by the two regional programmes. *Public transport* attracted a considerable amount of resources, but its weight in the total financial plan was less than half that of road transport (Table 6.2). The EPA managed an environmental research programme of about EUR 39 million.

The 2000-06 plan substantially contributed to the development of *urban and inter-urban transport infrastructure* (Chapter 2) and *water supply and wastewater infrastructure* (Chapter 3) (DoF, 2007; and DoT, 2007).¹² However, when measuring

the impact of the NDP infrastructure investments in terms of *convergence with the EU*, the picture is mixed. Ireland's energy productivity is outstanding, but the country's performance needs to improve to converge with the EU15 average in areas such as waste treatment, sustainable transport modes and renewable energy. Some trends in the period were also of concern, such as a decrease in freight transport by rail (Figure 6.3). This confirms the conclusions of the 2005 mid-term evaluation (Fitzpatrick Associates, 2005) that, despite progress in many environmental respects, Ireland lost relative position since other EU countries performed better, although without the NDP, Ireland's relative position would have been worse. Comhar argued that despite the considerable funding available, NDP implementation did not fully reflect the NSDS.

Programming period 2007-13

The *NDP 2007-13* was approved before the economic crisis hit the country and is based on forecasts of growth in the economy and population. Major goals include filling infrastructure gaps, enhancing enterprise development (leveraging research and innovation), investing in long-term environmental sustainability, strengthening all-island co-operation, and improving social inclusion and, ultimately, quality of life. The planned expenditure is almost entirely funded from domestic sources (mainly the Exchequer), and amounts to EUR 184 billion over seven years.¹³ The plan would probably need to be revised to reflect the changes in the economic situation. Public spending was severely cut in 2009, and it is unlikely that Ireland will be able to fully implement the NDP as initially approved.

Environmental sustainability is a horizontal objective of the strategic framework, together with regional development, all-island co-operation and the rural economy. Project selection must take full account of these principles. The plan reserves some EUR 25 billion for investment in environment services and waste management, public transport, renewable energy, sustainable agriculture, natural heritage preservation and environmental research. This is the equivalent of 14% of the overall funds; environmental services account for about 3% of the planned NDP expenditure, a smaller share than in the previous period (Table 6.2).

One NDP objective is to support implementation of the 2002 *National Spatial Strategy*, concentrating investment on a network of nine "gateways" the strategy identifies, and the surrounding areas.¹⁴ The plan also commits to taking account of the revised NSDS, once adopted, in the implementation phase. The first implementation report noted that measuring the "environmental dividend" of the NDP would require improving the set of indicators and the information available to assess the progress made and the remaining distance to targets.

Table 6.2 **Planned expenditure in National Development Plans,**^a 2000-06 and 2007-13

| Programmes ^b | 2000-06 ^c | | Programmes ^b | 2007-13 ^d | |
|--------------------------------------------------------------|----------------------|--------------|---------------------------------------------------|----------------------|--------------|
| | EUR million | (%) | | EUR million | (%) |
| Economic and social infrastructure, <i>of which:</i> | 28 267 | 50.0 | Economic infrastructure, <i>of which:</i> | 54 660 | 29.8 |
| National roads | 7 728 | 13.7 | Roads, airports and ports | 19 964 | 10.9 |
| Public transport | 3 534 | 6.3 | Public transport | 12 951 | 7.0 |
| Environmental infrastructure ^d | 3 129 | 5.5 | Environmental services ^h | 5 772 | 3.1 |
| Sustainable energy | 176 | 0.3 | Energy ⁱ | 8 526 | 4.6 |
| – | – | – | Communications, broadband | 435 | 0.2 |
| – | – | – | Government infrastructure | 1 413 | 0.8 |
| Housing, health facilities | 13 698 | 24.2 | Social infrastructure, <i>of which:</i> | 33 611 | 18.3 |
| Employment, human resources | 14 876 | 26.3 | Built and natural heritage | 540 | 0.3 |
| Productive sector | 4 489 | 7.9 | Human capital | 25 796 | 14.0 |
| – | – | – | Enterprise, science, innovation, <i>of which:</i> | 20 006 | 10.9 |
| – | – | – | Environmental research | 93 | 0.1 |
| – | – | – | Enhancement of environment and countryside | 6 028 | 3.3 |
| – | – | – | Coastal protection | 23 | .. |
| Regional operation programmes, ^e <i>of which:</i> | 8 713 | 15.4 | – | – | – |
| Local infrastructure ^f | 5 037 | 8.9 | – | – | – |
| Local enterprise development | 1 045 | 1.8 | – | – | – |
| Agriculture, rural development | 1 093 | 1.9 | – | – | – |
| Social inclusion, childcare | 1 538 | 2.7 | Social inclusion | 49 636 | 27.0 |
| Peace II operational programme | 141 | 0.3 | – | – | – |
| Technical assistance | 20 | .. | – | – | – |
| Total | 56 505 | 100.0 | Total | 183 709 | 100.0 |

a) At current prices.

b) Some programmes and subprogrammes are merged for the sake of presentation.

c) Planned expenditure as of end 2004.

d) Includes water supply and wastewater treatment infrastructure, water conservation, rehabilitation of the water network, and coastal protection.

e) For the Border Midland and Western (BMW) Region and the Southern and Eastern (S&E) Region.

f) Includes rural water and waste management, which account for about 35% of the BMW programme and 27% of the S&E programme.

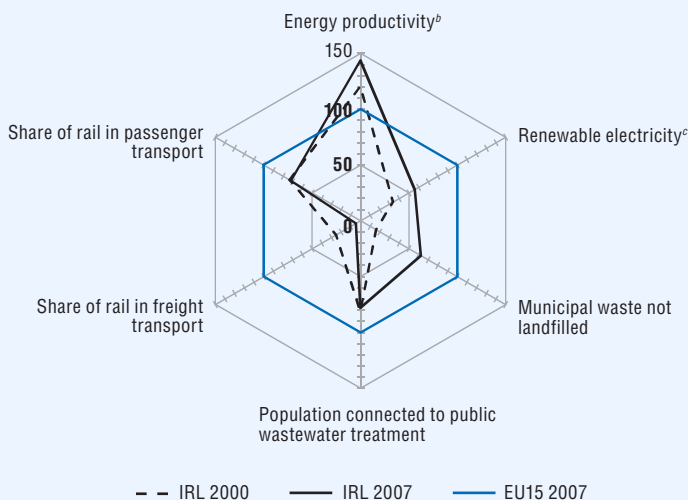
g) Indicative planned expenditure as of 2007.

h) Includes water services (EUR 4 748 million), waste management (EUR 753 million) and climate change (EUR 270 million).

i) Includes sustainable energy (EUR 276 million).

Source: Irish Government, Department of Finance; OECD, Environment Directorate.

Figure 6.3 Impact of the National Development Plan 2000-06 on convergence with the EU^a



a) Standardised performance indicators: EU15 = 100.

b) Inverse of energy intensity.

c) Share of electricity produced from renewable sources in gross national electricity consumption.

Source: OECD, Eurostat.

1.5 Integrating environmental concerns into sectoral policies: Energy

Framework

In October 2006, the government published an energy policy *green paper*, “Towards a Sustainable Energy Future for Ireland”. It was the first consultation paper on Irish energy policy published since the mid-1970s. The paper stated the country’s aim “to become a world leader in sustainable energy by 2020”. It proposed for discussion a series of objectives and actions to develop the energy sector, including biomass energy, renewable electricity and energy efficiency.

After public consultations, the paper was followed in March 2007 by an energy policy *white paper*, “Delivering a Sustainable Energy Future for Ireland”. The white paper is a long-term road map for development of the energy sector over the period to 2020 in terms of three overarching objectives: sustainability, security of supply and competitiveness of the energy sector. It is structured around 18 strategic goals and

more than 200 actions. The objectives and actions relevant to the *environmental sustainability objective* include:

- achieving 15% of electricity consumption from *renewable sources* by 2010 and 33% by 2020, implying a fourfold increase in renewable generation capacity; installing at least 500 MW of ocean energy capacity by 2020; supporting long-term development of offshore wind projects; pursuing the potential of solar energy; achieving 5% of renewables in the heating market by 2010 and 12% by 2020;
- increasing *combined heat and power* capacity to 400 MW by 2010 and 800 MW by 2020;
- achieving the EU target of 5.75% *biofuel* market penetration by 2010 and 10% by 2020; moving to a biofuel obligation on fuel suppliers by 2009; using pure plant oil in captive fleets maintained by local authorities and public bodies; mandating that Dublin Bus and Bus Éireann move all their vehicles to a 5% biofuel blend and achieve a 30% biofuel blend in all new buses; supporting second generation biofuels;
- encouraging *biomass* in power generation; using up to 30% biomass to co-fire peat power plants, also to extend the availability of peat in the energy mix beyond 2020 for energy security reasons; developing a reliable supply chain in the wood energy sector; developing an “all-island” approach to bioenergy in 2007-10;
- achieving 20% *energy savings* across the electricity, transport and heating sectors by 2020, in line with the EU objective; adopting an Irish standard for energy management in all workplaces and supporting its implementation in small and medium-sized enterprises; updating national building regulations by 2008; extending the existing Building Energy Rating on new dwellings to non-domestic buildings from July 2008; introducing smart meters for electricity customers;
- setting a target of 33% for *energy savings across the public sector*; publishing an action plan for green public procurement to catch up with the best performers in Europe by 2010; updating existing social housing design guidelines.

Most of these objectives and actions have been endorsed by the *Programme for Government 2007-12*, and are detailed in *sector-specific strategic documents*, such as the National Energy Efficiency Action Plan, the Bioenergy Action Plan and the Ocean Development Strategy. The white paper contains a mix of objectives and actions on demand-side management (energy efficiency) and energy supply. It incorporates many recommendations of the 2007 IEA review of Ireland’s energy policy. It also includes a provision for a regular review of its targets every two years and for a detailed and

comprehensive review of the energy policy framework every five years. Such reviews should carefully examine the cost-effectiveness of the measures taken and their coherence with other policies, particularly because of the interaction among energy-related targets and instruments and the EU Greenhouse Gas Emission Trading System (ETS). The delivery of the energy policy framework involves several institutions and requires a comprehensive integrated *whole-government approach* (Box 6.2).

In line with national policy objectives and EU directives, Ireland has made significant progress in *reforming and opening energy markets*, developing interconnections with the UK and expanding co-operation with Northern Ireland on an “*all-island*” basis. In November 2007, a single wholesale electricity market started to operate, merging the markets of Ireland and Northern Ireland. Gas market liberalization has been progressing, albeit slowly, and an all-island gas market is expected to open by early 2011. The wholesale and retail electricity markets are fully open to competition; the dominance of the Electricity Supply Board (ESB) in the electricity market has been greatly reduced, although it still serves nearly all domestic costumers.¹⁵

Efficiency in energy end-use

In a context of rapid economic growth, energy consumption increased less rapidly than GDP, leading to a further decrease in Ireland’s *energy intensity* (Figure 6.4). Nevertheless, some consumption trends remain of concern, in particular oil in the transport sector and electricity in the tertiary and residential sectors (Box 6.3). Explanations include growth in disposable income, increased use of household appliances, a preference for larger dwellings, growing demand for freight transport, increased urban sprawl and commuting, and growth in the car fleet (SEI, 2007).

Several *measures to promote energy efficiency* were introduced and implemented during the review period, mainly in the form of regulatory standards and financial assistance (Table 6.3). These measures addressed the residential, commercial and industrial sectors. Energy efficiency in transport has been tackled mainly through vehicle-related taxes, fuel efficiency standards and investment in public transport (Chapter 2). Sustainable Energy Ireland (SEI) is the main implementation body for energy efficiency support programmes, many of them funded under the NDPs (Box 6.2). Ireland has also been very active in promoting *public awareness on energy and environment issues*, for example through the “Power of One” multimedia campaign on energy efficiency, launched in 2006.

In the *residential and building sector*, in 2006 Ireland introduced the *Building Energy Rating* in line with the EU Directive on the Energy Performance of Buildings (2002/91/EC). Following encouraging results in the House of Tomorrow Programme,¹⁶ in 2007 the Irish Government further amended the *Building Regulations*,¹⁷ aiming at a

Box 6.3 Energy structure and trends

Significant economic and population growth during the review period led to increased *total primary energy supply* and *total final energy consumption*. Energy use is the major source of CO₂ emissions. As in the previous decade, the largest increase of energy consumption occurred in the transport sector (+34% between 2000 and 2006), followed by agriculture (+27%) and the residential sector (+22%). The transport sector and residential/commercial activities account for about 75% of TFC. Transport trends have worsened Ireland's high oil dependence: oil accounts for over 65% of TFC. On the other hand, consumption in services and industry grew less rapidly than TFC (by 14% and 10% respectively), indicating the decreasing role of energy-intensive industry in the Irish economy. Energy consumption per unit of industrial production decreased by over 25% in the period. *Electricity consumption* grew by 27.6%, more rapidly than TFC; the growth of electricity use in the tertiary (+45%) and residential (+27%) sectors is of particular concern.

Nevertheless, energy use increased at a lower rate than GDP, leading to a fall in energy intensities. *Primary energy intensity* (TPES per unit of GDP) decreased by 25.7% over 2000-07, reaching the lowest value in the OECD (0.1 toe/1 000 USD). This mostly reflects structural changes in the economy (the move towards high-value-added and low-energy-consuming sectors) and higher efficiency in electricity generation (IEA, 2007). Also, *final energy intensity* (TFC per unit of GDP) fell over the period, but to a minor extent (-14%); since 2004, it has been increasing slightly, showing that there is scope for further gains in energy efficiency in end-use. *Intensity of electricity use* also decreased (-9%), but not as fast as the primary and final energy intensities.

The *structure of TPES* shows a *dominance of fossil fuels* (96.4%), including oil, coal and natural gas, well above the OECD average of 82.7%. Peat is the main domestic energy source, used for electricity production and household heating; the other fossil fuels are mostly imported. The share of peat, coal and oil in TPES has declined, compensated by increases in natural gas and, secondarily, renewables. *Energy supply from renewables* almost doubled in the review period, reaching 446 ktoe in 2007. This growth was due to a sixfold increase in wind generation and to the use of biomass and solid waste, which account for about half the renewable energy supply. However, the contribution of renewables to TPES (2.9%) remains relatively low compared to other OECD countries, despite the high wind resource potential.

The share of peat in domestic *electricity generation* remained relatively stable. Peat resources are expected to last until 2020 at the current rate of use (IEA, 2007). The share of other coal products and oil in electricity output declined considerably, mainly to the advantage of natural gas, which accounts for nearly 60% of electricity generation. *Electricity production from renewable sources* (mostly wind) also increased, with renewables accounting for 9.8% of electricity generation and 9.3% of gross electricity consumption in 2007. The latter compares with the indicative target of 13.2% by 2010 set by EU Directive 2001/77/EC; Ireland expects to exceed this target and has increased its domestic target to 15%. The switch to natural gas and the opening of new power plants has largely contributed to the increase in the efficiency of electricity generation. However, part of the generation park is aging and transmission and distribution losses are relatively high.

Box 6.3 Energy structure and trends (*cont.*)

To meet Ireland's objective of fuel diversification and comply with the EU Large Combustion Plant Directive, further steps have been taken to *improve efficiency and environmental performance of fossil-fuelled power plants*. The Moneypoint Environmental Retrofit Project entails retrofitting flue gas desulphurisation and selective catalytic reduction equipment at the coal-fired Moneypoint plant (900 MW). The project is scheduled to be completed in 2009 and is expected to contribute to substantial reductions in SO_x, NO_x and dust emissions. Two new *state-of-the-art peat-fired power stations* replaced the old plants at Shannonbridge and Lanesboro. A number of other plants throughout the country were also closed. The Edenderry Plant has been co-fired by peat and biomass on a trial basis.

Table 6.3 Measures to promote energy efficiency and renewable energy sources, 2000-08

| Measure | Year ^a | Target/sector | Details |
|---------------------------------------|-------------------|----------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Amendment of the building regulations | 2008 | Buildings; renewables | Minimum efficiency standards, including: <i>i</i>) mandatory levels of energy efficient fixed light fittings; <i>ii</i>) minimum seasonal net efficiency of oil and gas fired boilers at 86%; <i>iii</i>) airtightness testing; <i>iv</i>) minimum share of energy consumption provided on-site by renewable energy sources (10 kWh/m ² /year for space and water heating or cooling, or 4 kWh/m ² /year of electricity, or a combination of the two); <i>v</i>) suitability of the building to future upgrades to higher energy and CO ₂ standards. |
| Home Energy Saving Scheme | 2008 | Buildings (domestic) | Grants to householders of up to 30% of the capital cost of upgrading building energy performance (insulation of walls and roof, double glazed windows, and heating controls). With a budget of EUR 100 million, the scheme will upgrade about 60 000 houses. |
| Low-carbon Homes Programme | 2008 | Buildings (domestic); renewables | Capital grants (up to 40% of eligible expenditure, up to EUR 15 000 per housing unit) for housing developments that improve energy and CO ₂ performance by at least 70% compared to the 2005 Building Regulations standards. The minimum requirements are: <i>i</i>) building energy rating of A2; <i>ii</i>) energy performance coefficient lower than 0.25; <i>iii</i>) CO ₂ performance coefficient lower than 0.30; <i>iv</i>) electricity generation onsite per unit equivalent of 10 kWh/m ² /year (including from renewables). The preferred scale of projects is between 5 and 15 units. The level of support depends on various factors, including the level of innovation proposed, the performance improvement, and the floor area. |

Table 6.3 **Measures to promote energy efficiency and renewable energy sources, 2000-08** (*cont.*)

| Measure | Year ^a | Target/sector | Details |
|---------------------------------------------------------------|-------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Microgeneration Support Programme | 2008 | Renewables; electricity | Capital grants to meet 50% of the initial start up costs for the installation of microgeneration systems in about 50 pilot cases. |
| Combined Heat and Power (CHP) Programme | 2007 | Renewables; industry, commerce, services, public sector, ESCOs | Capital grants for the installation of small-scale (less than 1 MW) fossil fired CHP and biomass CHP systems, up to 40% of feasibility study costs and 30% of investment costs (with maximum costs per kWe depending on capacity). The CHP plant, when operational, must meet specified energy savings requirements, in line with EU Directive 2004/8/EC. The programme is managed by SEI with a budget of EUR 11 million. |
| Greener Homes Scheme | 2006 | Renewables for heating (domestic) | Capital grants to householders who invest in renewable energy based heating systems (solar thermal space and hot water heating, heat pump, wood chip or pellet stoves and boilers, biomass/wood pellet stove with integral boiler). A new phase was introduced in September 2007 with revised terms and conditions for lower-income housing, school and community schemes. The scheme is administered by SEI with a five-year budget of EUR 27 million. |
| Renewable Heat Deployment Programme (Reheat) | 2007 | Renewable for heating (industrial, commercial, public and community premises and ESCOs) | Capital grants for renewable heating systems (boilers fuelled by wood chips and/or wood pellets; solar thermal pumps; heat pumps) up to 40% of the feasibility study costs (with maximum of EUR 5 000 per technology) and 30% of investment costs (limited by a maximum qualifying cost profiles per kWh, varying with capacity size, for each technology). All the supported systems must carry the CE mark and are subject to efficiency requirements as well as the meeting of relevant standards. The programme is administered by SEI with a budget of EUR 26 million. |
| Sustainable Energy Incubator Programme | 2007 | Renewables; R&D; industry | Two-year grants for the annual incubation fees and for supplementary business support up to a maximum of EUR 22 000 per year. Open to companies developing new clean energy technologies, based in 21 existing Irish Incubation Units. Priority areas identified for 2008 were bioenergy, ocean energy, wind energy, microgeneration, energy efficiency, fuel cells and hydrogen. |
| Accelerated capital allowances for energy efficient equipment | 2008 | Multisectoral policy | Corporate tax allowance of 100% of the capital cost of energy efficient plants and machinery in the year of purchase. Introduced in 2008 and expanded in 2009. Seven categories of equipment are eligible: <i>i</i>) large information technology equipment; <i>ii</i>) heating/electricity provision equipment and control systems; <i>iii</i>) process and heating ventilation and air-conditioning systems; <i>iv</i>) alternative fuel vehicles; <i>v</i>) motors and drives (up to EUR 1 000), <i>vi</i>) lighting (up to EUR 3 000); <i>vii</i>) building energy management systems (up to EUR 5 000). |

Table 6.3 **Measures to promote energy efficiency and renewable energy sources, 2000-08 (cont.)**

| Measure | Year ^{a)} | Target/sector | Details |
|---------------------------------------------------|--------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Building Energy Rating (BER) certificate | 2006 | Buildings | The BER system for a new dwelling ranges from A1 (most energy efficient) to G. The rating is set out in a certificate, which indicates also CO ₂ emissions (from heating, ventilation, hot water and lighting) and is accompanied by an advisory report on how the energy performance of the building might be cost effectively improved. |
| Energy Agreements Programme | 2006 | Industry | Large firms joining the voluntary scheme commit to progressively meet the requirements of Irish energy management standard IS 393; SEI provides IS 393 training. |
| Energy Management Action Programme | | Industry | Online assistance tool to guide small and medium-sized enterprises in designing an energy action plan; <i>ad hoc</i> training courses. |
| Pilot Bioheat Boiler Deployment Programme | 2005 | Bioenergy, heating and cooling (domestic and industry) | Capital grants for boiler systems (typically rated between 60 kW and 1 000 kW) that are fuelled by wood pellets and/or wood chip fuel: 25% of the capital costs and 45% of the feasibility study cost (up to EUR 5 000). |
| Renewable energy feed-in tariff (REFIT) | 2005 | Renewables; electricity | Fixed price tariffs (long- and short-term tariffs) per kWh of electricity produced from renewable sources, differentiated by source. |
| Tax relief for corporate investment in renewables | 2002 | Renewables | Corporate tax relief up to 50% of capital expenditure on renewable energy projects. Extended in 2002 until December 2004. |
| House of Tomorrow Programme | 2001 | Renewables; buildings | Capital grants to housing developers who designed buildings to consume 40% less energy for space and water heating than the Building Regulations standards, while incorporating innovative energy saving and low CO ₂ technologies: EUR 8 000 per dwelling (for 10 to 50 dwellings). The programme ended with the entrance into force of the revised Building Regulations in 2008. |
| Public Sector Buildings Programme | 2001 | Renewables | Financial support of up to 50% of the cost of implementing energy efficiency and renewable energy solutions, to a limit of EUR 500 000. All applications were accompanied by an independent design and feasibility study; 73 demonstration projects were financed. The programme had a budget of EUR 12.7 million; it is now closed to applications. |
| Warmer Homes Scheme | 2002 | Buildings (domestic) | Capital grants covering the full cost of wall and roof insulation, boiler lagging jackets, CFLs and draught proofing measures. Eligible homes are those owned or rented by low-income households. |

a) Year of introduction or first year of operation.

Source: OECD-IEA, IEA Global Renewable Energy Database.

40% improvement in the energy and CO₂ emission performance of the housing sector. The new rules were phased in gradually, to allow for the necessary industry adjustments, and since mid-2009 have been applied to all new homes. The Building Regulations are set to be reviewed in 2010 with a view to moving from a 40% to a 60% improvement, building on evidence expected from the *Low Carbon Homes Programme*. Other support measures have addressed energy performance in existing private and public buildings. Examples include the Home Energy Saving Scheme and the Public Sector Programme (Table 6.3). Ireland started to phase out *incandescent light bulbs* in September 2009, in accordance with the relevant EU rules.¹⁸

Concerning the *business sector*, in 2005 Ireland introduced the *Irish Energy Management Standard* (IS393) for companies. It specifies requirements for continuous improvement in energy performance and obliges participating organisations to design and implement an energy management system. The Irish standard has been taken as the basis for an EU-wide version. SEI assists large energy-intensive companies in meeting the standard (Energy Agreements Programme) and offers small and medium-sized enterprises technical assistance and *ad hoc* training courses (Energy Management Action Programme) (Table 6.3). SEI also facilitates the voluntary *Large Industry Energy Network* (LIEN), involving 85 industrial companies developing an energy management and audit programme. Since its launch in 1995, LIEN member companies have reduced their energy consumption by an average of 3% per year and their CO₂ emissions by nearly 150 million tonnes per year. More recently, adoption of the IS393 standard has been the major driver of reported energy savings (SEI, 2008). A tax incentive introduced in 2008 allows enterprises to deduct the full capital cost of energy efficient equipment when filing corporate tax.

These energy efficiency measures, which have helped reduce energy consumption, form the core of the National Energy Efficiency Action Plan 2009-20 to achieve 20% savings in energy use by 2020 (Table 6.4). There are *cost-effective opportunities to further improve energy efficiency* across all sectors of the Irish economy. The residential sector provides the greatest potential for efficiency gains, followed by the commercial and industrial sectors (KEMA, 2008).¹⁹ Estimates indicate that implementing a programme in the household, industry and tertiary sectors to reduce energy use by 20% by 2020 would generate net economic benefits of nearly EUR 300 million per year. Energy efficiency measures should be fully represented in Ireland's strategy for *economic recovery*, given their potential for improving overall competitiveness of the Irish economy, reducing costs for households and, last but not least, curbing greenhouse gas emissions. These benefits would best be realised if energy efficiency measures built on the removal of energy subsidies and energy tax exemptions and the adjustment of energy taxes, so that end-use prices reflected environmental costs.

Energy mix

Ireland's energy supply depends heavily on imported *fossil fuel* (Box 6.3). The share of natural gas in the energy mix has steadily increased, especially for electricity generation (Figure 6.4). The share of *renewable sources* has also increased, reaching nearly 3% of energy supply – relatively low compared to other OECD countries (Figure 6.5). Developing renewable energy sources and reducing the share of fossil fuel in the energy mix would improve the security and environmental sustainability of Ireland's energy supply.

In 2006 Ireland opted for a renewable energy *feed-in tariff* (REFIT) to support *electricity generation from renewable sources*, replacing the alternative energy requirement programme, which had produced unsatisfactory results (IEA, 2007).²⁰ The option of tradable renewable certificates was also under consideration, but was dismissed due to the small size of the market at that time. Support is given in the form of fixed prices per kWh of electricity produced, differentiated on the basis of the renewable source so as to favour those sources that are at the earlier stages of development in the country: large wind farms receive the lowest tariff, whereas the highest price is awarded to ocean energy.²¹ Overall, the REFIT levels offered are lower than in some OECD countries because of Ireland's high potential for renewables (and potentially high profitability) (IEA, 2007). Nevertheless, Ireland should regularly assess its renewable support system, in consideration of the development of the electricity market and of the ETS.

As of end 2008, 1 500 MW of renewable electricity capacity had been awarded REFIT support, *i.e.* nearly three times the existing wind capacity connected to the system. The projects have all secured planning permission and a suitable connection offer, so a high implementation rate is expected. This capacity would allow Ireland to *not just meet but exceed its 2010 target on renewable electricity*. In addition, the larger all-island market is set to reduce some entry barriers and stimulate investment in renewable power generation. However, Ireland's *electricity system and grid* need considerable development to accommodate the integration of new renewable generating capacity, especially wind power, and reach the 33% target by 2020.²² Timely development of the transmission networks is challenging from a planning perspective. Public resistance to overhead lines will also need to be addressed.

Ocean energy is seen as having high development potential in Ireland. A major programme to support this emerging technology was launched in 2008, with more than EUR 26 million earmarked over three years to assure development and testing of prototype ocean energy facilities.

As for *heat from renewables*, Ireland's Greener Homes and ReHeat programmes, addressing dwellings and businesses, respectively (Table 6.3), attracted applications totalling more than twice the initial target. The result was a dramatic increase in renewable technology suppliers and a tenfold expansion in the number of renewable energy products on the market. Despite the limited availability of biomass resources, Ireland should continue to promote the uptake of appropriate technology for biomass heating. Provided that biomass production meets sustainability criteria, biomass heating is a valid alternative to oil and peat heating in areas not connected to the gas network (IEA, 2007).

In 2006, Ireland introduced the Biofuels Mineral Oil Tax Relief Scheme to kick-start the domestic *biofuel* industry and, in the long term, reduce dependence on imported fossil fuels. The uptake of biofuels considerably increased as a result, from less than 0.1% of road fuel consumption in 2006 to 1.6% in 2008, compared with an intermediate target of 2.2% by 2008. The scheme is scheduled to end in 2010. There are plans to introduce a biofuel obligation on suppliers of petrol and diesel, associated with a market for tradable certificates. Public consultation was held in autumn 2008 with a view to making the programme operational in mid-2010. Ireland also subsidises bioenergy crops.

Energy prices

Energy prices in Ireland are relatively high for both domestic and industrial consumers, compared to other OECD countries (Table 6.5). Prices have risen substantially since 2000, in line with world price trends. Ireland's heavy dependence on imported fossil fuel exposes it to the influence of international markets. The reliance on gas for a significant proportion of electricity generation is a major factor in high electricity prices. Other factors include the small market size, ageing infrastructure, high demand growth, low levels of interconnection with other countries and higher-than-average labour costs (IEA, 2007). While *pre-tax prices of motor fuel* are in line with those in other European countries, final prices are relatively low, reflecting low taxation, especially when converted in purchasing power parities (Chapter 2).

Ireland has taken steps to address the *domestic causes of high prices*, including improvement of the electricity and gas infrastructure and removal of barriers to competition, and has avoided interfering with prices (IEA, 2007). Infrastructure investment costs are ultimately borne by end-users through transmission and distribution charges. The *all-island markets* for electricity (open since 2007) and gas (due in early 2011) are expected to enlarge the size of the markets, allow for more competition and, in turn, help reduce energy prices. However, prices should adequately reflect environmental impacts of energy generation and use, including the cost of

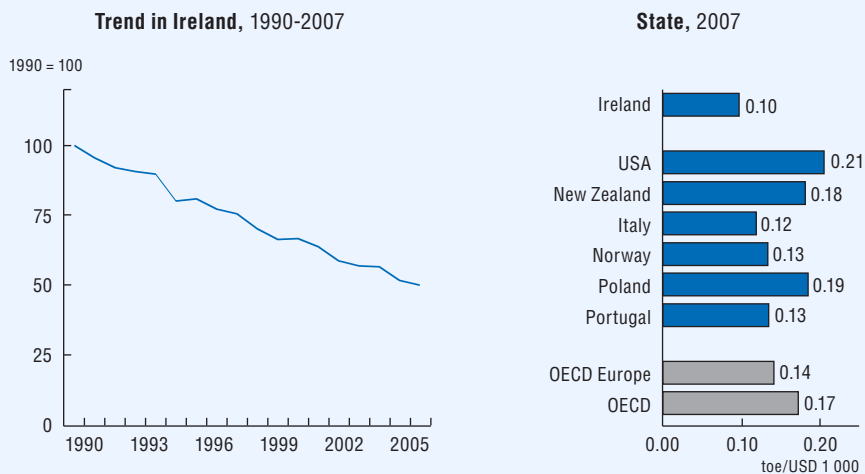
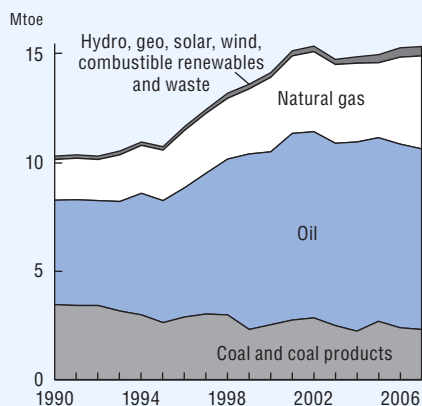
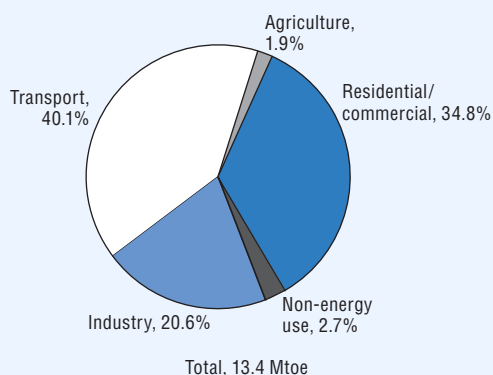
Table 6.4 Projected energy savings to 2020

| | GW _h PEE ^a | ktCO ₂ |
|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|-------------------|
| Business and public sector | | |
| SEI Public Sector Building Demonstration Programme | 140 | 40 |
| Building Regulations 2005 – improved efficiency of non-residential buildings | 560 | 133 |
| Building Regulations 2010 – 30% improvement on energy performance of non residential buildings relative to 2005 Building Regulations | 1 360 | 322 |
| SEI Large Industry Programmes (Energy Agreements IS393 and Large Industry Energy Network) | 4 070 | 887 |
| SEI small business supports – Energy MAP and training for small businesses | 565 | 141 |
| Existing ESB demand side management initiatives | 435 | 96 |
| Renewable Heat Deployment Programme (ReHeat) | 410 | 92 |
| Accelerated capital allowances for energy-efficient equipment | 800 | 143 |
| Total | 8 340 | 1 854 |
| Residential sector | | |
| Building Regulations 2002 – improved energy performance of residential buildings | 1 015 | 266 |
| Building Regulations 2008 – 40% improvement on energy performance of residential buildings relative to 2002 Building Regulations | 2 490 | 615 |
| Building Regulations 2010 – 60% improvement on energy performance of residential buildings relative to 2002 Building Regulations | 1 100 | 272 |
| Low Carbon Homes 2013 – 70% improvement on energy performance of residential buildings relative to 2002 Building Regulations | 395 | 98 |
| House of Tomorrow Programme – developer support for buildings exceeding existing building regulations | 30 | 7 |
| Warmer Homes Scheme | 170 | 42 |
| Home Energy Saving scheme – improving current residential building stock | 600 | 157 |
| Smart meter installation – estimated efficiency gains among domestic users | 690 | 120 |
| Greener Homes Scheme | 265 | 64 |
| Ecodesign for energy-using appliances (lighting) | 1 200 | 210 |
| Efficient boiler standard | 2 400 | 585 |
| Total | 10 355 | 2 436 |
| Transport | | |
| Improved fuel economy of private car fleet | 1 530 | 412 |
| Efficient driving measures | 655 | 176 |
| Electric vehicle deployment | 955 | 350 |
| Mobility management – travel plans | 1 090 | 294 |
| Vehicle registration tax/motor tax changes | 200 | 54 |
| E-working | 150 | 40 |
| More sustainable public transport fleets | 90 | 24 |
| Total | 4 670 | 1 350 |
| Energy supply | | |
| Transmission and distribution efficiencies improvement – reaching loss target of 7.5% | 310 | 72 |
| Winter Peak Demand Reduction Scheme | 55 | 10 |
| Total | 365 | 82 |
| Total projected savings | 23 730 | 5 722 |
| National 20% savings target | 31 925 | |

a) Primary energy equivalent.

Source: DoCENR (2009).

Figure 6.4 Energy structure and intensity

Energy^a per unit of GDP^bEnergy supply by source,^c
1990-2007Total final energy consumption
by sector, 2006

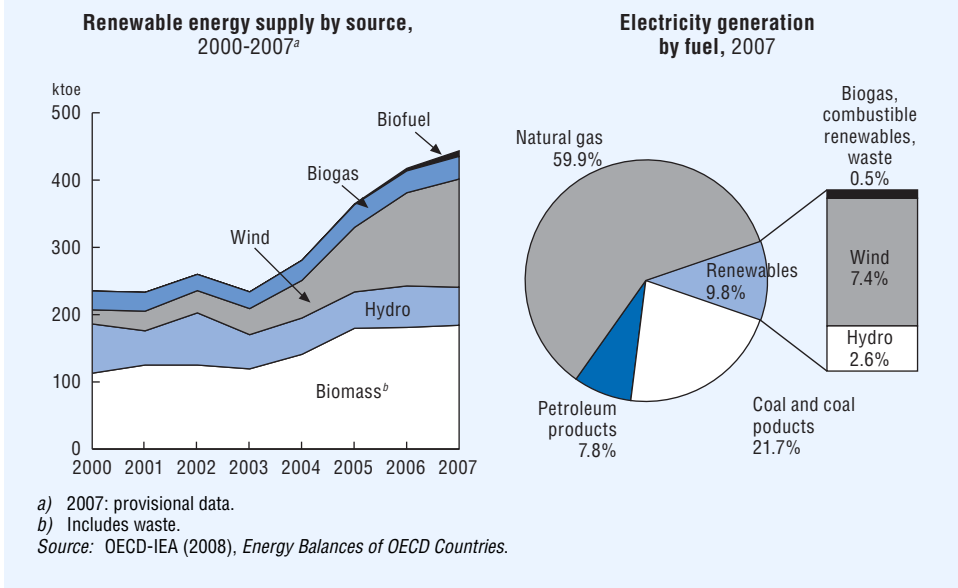
a) Total primary energy supply. 2007: preliminary data.

b) GDP at 2000 prices and purchasing power parities.

c) Breakdown excludes electricity trade.

Source: OECD-IEA (2008), *Energy Balances of OECD Countries*; OECD (2008), *OECD Economic Outlook No. 84*.

Figure 6.5 Renewable energy



carbon, for example through increased taxation on fossil fuels for sectors not covered in the ETS, and by letting the cost of the ETS allowances be passed on to final electricity consumers (Chapter 8).

The Commission for Energy Regulation (CER) regulates *electricity and gas tariffs* for domestic customers and small to medium-sized businesses (Box 6.2). The electricity tariff structure provides incentives to shift electricity demand to non-peak hours or night, and allows for short-term interruptions by businesses, in an effort to smooth demand and improve electric system stability. A *public service obligation* (PSO) requires electricity suppliers, including ESB, to buy power generated from peat and renewables. The CER sets a PSO levy, charged to all electricity customers, to let suppliers recoup the additional costs incurred.

1.6 Market-based integration

Environmentally related taxes

Revenue from environmentally related taxes increased in real terms by 5.8% between 2000 and 2007, but decreased by over 8% in 2008 as a consequence of the

economic crisis. The share of environmentally related taxes in GDP decreased to 2.4% in 2008. The share of such taxes in total tax revenue has also decreased (it was 7.8% in 2007) but has always remained above the OECD Europe average (6.6% in 2006) (Table 6.6). As in all OECD countries, most of this revenue comes from *energy and vehicle taxes*. Despite the rapid increase in final energy consumption, revenue from energy taxes (mainly on transport fuel) has increased only slightly, and its share in environmentally related tax revenue has fallen steadily since 2002. This indicates that excise rates have not been adequately adjusted to inflation, which has been relatively high in Ireland. Revenue from vehicle taxes has increased faster with growth of car ownership. Revenue from the *waste related levies* has nearly doubled in real terms since 2002, when the plastic bag and landfill levies were introduced (Box 4.3).

Table 6.5 Energy prices in selected OECD countries, 2008

| | Electricity | | Oil | | Natural gas | | |
|---------------------|-------------------------------------|---------------------------------------|----------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------|--------------------------------------------------------|----------------------|
| | Industry (USD ^c /kWh) | Households (USD ^c /kWh) | Industry ^a (USD ^c /tonne) | Households ^b (USD ^d /1 000 litres) | Industry (USD ^e /10 ⁹ kcal) | Households (USD ^e /10 ⁹ kcal) | |
| | | | High-sulphur oil | Low-sulphur oil | | | |
| Ireland | 0.186 | 0.185 | 447.4 | .. | 887.4 | 616.2 | 716.3 |
| United States | 0.070 ^e | 0.114 ^e | 558.4 | .. | 892.0 | 368.1 | 525.3 |
| New Zealand | 0.071 | 0.149 | 682.6 | 522.0 ^f | .. | 208.8 ^f | 1 094.8 ^f |
| Italy | 0.290 | 0.240 | .. | 643.3 | 1 492.6 | 645.5 | 905.9 |
| Norway | 0.064 | 0.098 | x | .. | 942.2 | x | x |
| Poland | 0.119 | 0.232 | 486.8 | 634.0 | 1 495.6 | 531.7 | 1 122.9 |
| Portugal | 0.131 | 0.214 | x | 789.6 | 1 335.1 | 531.9 | 1 037.9 |
| OECD Europe | 0.117 ^f | 0.179 | .. | 660.7 | 951.2 | .. | .. |
| OECD | 0.102 | 0.135 | 352.3 ^g | .. | 951.6 | 428.9 | 657.1 |
| IRL/OECD Europe (%) | 128 ^f | 103 | .. | .. | 93 | .. | .. |
| IRL/OECD (%) | 182 | 137 | 119 ^g | .. | 93 | 144 | 109 |

..: not available, x: not applicable.

a) High-sulphur oil or low-sulphur oil.

b) Light fuel oil.

c) At current exchange rates.

d) At current purchasing power parities.

e) Price excluding tax.

f) 2007.

g) 2005.

Source: OECD-IEA, *Energy Prices and Taxes*, 3rd quarter 2009.

The role of environmentally related fiscal measures in government budgets has been recently strengthened. The *fiscal package for 2009*, designed to tackle the economic recession, introduced a number of environmentally related taxes, such as the air travel tax and a car parking levy, and increased the rates of the motor and mineral oil taxes (Table 6.7). Environmentally related taxation accounts for about 9.5% of estimated additional annual tax yield and 0.27% of GDP.²³

The Programme for Government 2007-12 mandates the *Commission on Taxation* to review the structure and efficiency of the Irish taxation system and, more specifically, to investigate fiscal measures to protect the environment, including a carbon tax. The commission reported to the finance minister in September 2009, recommending comprehensive tax reform to broaden the tax base while keeping the overall tax burden low, especially as regards corporate tax (GoI, 2009). In particular, the commission recommended: *i*) introducing a tax on the CO₂ content of energy products in non-ETS sectors, excluding agriculture (Chapter 8); *ii*) phasing in domestic volume-based water charges over five years and increasing charges on waste and commercial water use to assure full cost recovery; *iii*) phasing out the vehicle registration tax over ten years and replacing it with charges based on car use; *iv*) restructuring house and land property taxation; *v*) strengthening local government financing through property taxes and waste and water charges, among other instruments. The report also suggests reviewing tax expenditures (public expenditures in the form of tax breaks and exemptions) with a

Table 6.6 Revenues from environmentally related taxes and levies, 2000-08

| | | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|-------------------------------------|-------------|---------|---------|---------|---------|---------|---------|---------|---------|---------|
| Energy | EUR million | 1 495.6 | 1 369.3 | 1 626.4 | 1 696.4 | 1 958.2 | 2 042.4 | 2 141.3 | 2 204.1 | 2 170.1 |
| Vehicles | EUR million | 1 479.7 | 1 333.8 | 1 373.8 | 1 488.6 | 1 702.8 | 1 950.8 | 2 167.1 | 2 362.8 | 2 178.8 |
| Waste ^a | EUR million | 0.0 | 0.0 | 25.1 | 42.2 | 40.3 | 45.3 | 49.5 | 54.9 | 26.3 |
| Environmentally related tax revenue | EUR million | 2 975.3 | 2 703.1 | 3 025.3 | 3 227.1 | 3 701.3 | 4 038.5 | 4 357.9 | 4 621.8 | 4 375.2 |
| Share of total tax revenue | % | 8.96 | 7.84 | 8.25 | 8.06 | 8.29 | 8.18 | 7.82 | 7.79 | .. |
| Share of GDP | % | 2.84 | 2.31 | 2.32 | 2.31 | 2.48 | 2.49 | 2.46 | 2.42 | 2.36 |
| OECD Europe: share of tax revenue | % | 6.99 | 6.99 | 7.00 | 7.17 | 7.09 | 6.91 | 6.58 | .. | .. |
| OECD Europe: share of GDP | % | 2.73 | 2.68 | 2.66 | 2.71 | 2.66 | 2.63 | 2.53 | .. | .. |

a) Levies on plastic bags and landfills. 2008: plastic bag levy only.

Source: OECD; OECD/EEA database on economic instruments for environment; European Commission; Irish Tax and Customs; CSO.

view to discontinuing some of them, such as income tax relief for service charges (including commercial water charges). The report states that these environmental fiscal measures are important tools for pursuing Ireland's green economy goals.

Transport-related taxes

Until 2008, the *vehicle registration tax (VRT)*, for first-time registration of a vehicle in Ireland, and the *annual motor vehicle tax* were linked to engine size. They had little influence on consumer behaviour as disposable income increased and Irish citizens bought more and larger cars.²⁴ VRT relief of 50% was available for new hybrid, electric and flexible fuel vehicles (those that can use a bioethanol mix).

In line with the National Climate Change Strategy 2007-12, *the rates for calculating the VRT and the motor tax were increased and revised in 2008 to reflect CO₂ emission levels*, and have since been linked to a new mandatory labelling system (Table 6.8). The 50% VRT relief for hybrid, electric and flexible fuel cars was converted to relief of up to EUR 2 500 on the payable VRT, decreasing with vehicle age and applicable until 2010. Electric cars and electric or battery-assisted cycles are exempt from the VRT in 2008-10. However, heavy duty vehicles pay a fixed registration tax of EUR 50, far below that for cars. Ireland should consider extending the emission-based VRT rates to heavy duty vehicles. Consistent with the new VRT system, capital allowances and deductions from the corporate tax for leasing business cars are higher for more CO₂ efficient vehicles.

The revision of the car taxation system is a *remarkable step forward*, which places Ireland among the leaders in Europe and the OECD. It provides an *immediate incentive* to buy more CO₂-efficient cars. At the same time, differentiation of the annual motor tax gives an incentive to switch to cars with lower emissions. This also applies during the transition period from one system to the other, because the emission-based rates are lower for smaller cars than the engine-based rates (and they are higher for larger cars). The same rates apply to petrol and diesel vehicles in the same band since, distance travelled being equal, the level of emissions is the same irrespective of the fuel used. However, the lower excise rate applied to diesel fuel is an incentive to buy diesel cars and to drive longer distances over the lifetime of a vehicle. The VRT rate (per car) and the motor tax rate (per year) are higher in Ireland than in other OECD countries that differentiate vehicle taxes on the basis of CO₂ emissions. Moreover, the estimated tax rate that car owners face per tonne of CO₂ emitted over a vehicle's lifetime is much higher than the price of carbon applied to other sectors of the economy (e.g. in the EU ETS) (OECD, 2009b). There would seem to be an argument for finding a more cost-effective *balance between taxation on purchase and ownership of vehicles and that on vehicle use, i.e. on fuels and road use*

Table 6.7 Environmental fiscal measures in the government budget,^a 2009

| Measure | Type | Yield/cost ^b (EUR million) | Description |
|----------------------------------------------------------|---------------|------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Increase in mineral oil tax on automotive diesel fuel | Tax | 100 | Increase of the tax on automotive diesel, jet kerosene for non-business use and diesel used for private pleasure navigation, by EUR 0.05/litre (including VAT). |
| Increase in mineral oil tax on petrol | Tax | 166 | Increase of the tax on petrol and aviation petrol by EUR 0.08/litre (including VAT). |
| Cycle to work scheme | Tax exemption | -0.4 | Benefit-in-kind ^c tax exemption consisting of bicycles and associated safety equipment provided by employers to employees who cycle to work. |
| Levy on car parking facilities | Charge | 10 | Flat rate levy of EUR 200 per year payable by employees who are entitled to use parking facilities provided by their employers in the main urban centres (Cork, Dublin, Galway, Limerick and Waterford) (implemented from 2010). |
| Benefit-in-kind charge for company cars ^c | Charge | - | Change of the calculation basis of the charge on the private use of company cars by employees, to relate it to CO ₂ emission levels. |
| Air travel tax | Tax | 150 | Tax applying to all departures from Irish airports at the general rate of EUR 10 per passenger, with a lower rate of EUR 2 for journeys under 300 km. |
| Increase in motor tax rates | Tax | 40 ^c | 4% increase for cars below 2 500 cc and 170 g CO ₂ /km; 5% increase for cars above 2 500 cc and 170 g CO ₂ /km; 4% increase for all other vehicles except electric vehicles. |
| Increase in car trade licence plate | Tax | .. | 4% increase. |
| Capital allowances scheme for energy efficient equipment | Tax allowance | -5 | Extension of the capital allowances introduced by the Finance Act 2008 to purchase energy efficient technology (100% of expenditure incurred by companies) to four other categories of equipments (pending European Commission clearance). |
| Seveso-listed industrial facilities | Tax incentive | .. | Ring-fenced tax incentive to facilitate removal and relocation of Seveso-listed industrial facilities (subject to European Commission clearance). |
| Farm pollution control relief | Tax allowance | -10 | Extension of the capital allowances for expenditure on pollution control to 2010. |

a) Includes the 2009 government budget (14 October 2008) and supplementary budget (7 April 2009).

b) Yield of taxation or cost of tax exemptions/allowances in a full year of implementation.

c) Benefits in kind are usually taxable in Ireland. d) Includes yield of the increase in the car licence plate.

Source: Department of Finance.

(road pricing proportional to mileage and environmental damage caused per kilometre). The annual motor tax could also be modulated on the basis of actual vehicle use.

The *air travel tax* introduced in the 2009 budget has been in effect since March 2009. Paid by airline operators, it applies to all departures from Irish airports, with a reduced rate for flights to destinations not more than 300 km from Dublin Airport (Table 6.8). In practice, the reduced rate applies to all domestic flights and those to some UK destinations (e.g. Cardiff, Glasgow, Liverpool, Manchester). The reduction favours air travel to Irish destinations that are also reachable by direct train, some of which are already subsidised through a PSO.

Energy taxes

Excise duties (mineral oil tax) on energy products are relatively low in Ireland compared to many OECD countries. For many energy products, the tax rate is set at the *minimum level* defined by the EU directive for taxation of energy products (2003/96/EC), such as heavy fuel oil for heating, liquid petroleum gas for automotive use and heating coal (Table 6.8). The mineral oil tax was extended to coal only in 2005, in compliance with EU requirements. The implicit tax rate on energy was EUR 147.9/toe in 2007, below the euro-area average of EUR 188.3/toe.²⁵ While energy prices are relatively high by OECD standards, the share of taxes in end-use prices is comparatively low and decreasing over time. A *national oil reserve levy* of EUR 0.02/litre is imposed on oil products, except jet kerosene and oil used for bunkers, to fund the National Oil Reserves Agency.

Concerning *motor fuels*, the excise rate on diesel is lower than that on unleaded petrol, while the carbon content of diesel is higher. This differentiated taxation has encouraged the sale of diesel vehicles, which emit more NO_x and PM per kilometre than petrol vehicles. In addition, Ireland's lower tax rates on petrol and diesel have translated into lower prices than in some OECD countries, especially the United Kingdom. This significant tax differential, along with the exchange rate differential between the euro and the pound sterling, has resulted in "fuel tourism" at the border with Northern Ireland (Chapter 2). The tax differential has been progressively reduced in recent years. The mineral oil tax on automotive diesel and petrol was further increased in 2009 (Table 6.7).

In accordance with the EU energy tax directive, in 2008 Ireland introduced excise duty on electricity supplies. This *electricity tax*, charged on the final supply of electricity to the consumer, is paid by electricity suppliers. However, the rates are set at the minimum level required by the directive; domestic customers are fully exempted (Table 6.8).

Table 6.8 Energy and transport taxes, 2009^a

| | Rate | VAT ^b (%) |
|-------------------------------------------------------|------------------------------------------|----------------------|
| Mineral oil tax | | |
| Petrol | EUR 508.79/1 000 litres | 21.5 |
| Aviation petrol ^c | EUR 508.79/1 000 litres | 21.5 |
| Heavy oil used as propellant (automotive diesel) | EUR 409.2/1 000 litres ^d | 21.5 |
| Heavy oil used for air navigation ^e | EUR 409.2/1 000 litres ^d | 21.5 |
| Jet kerosene ^e | EUR 409.2/1 000 litres ^d | 13.5 |
| Kerosene used other than as a propellant ^e | – | 13.5 |
| Fuel oil (for electricity generation) | EUR 14.78/1 000 litres | 13.5 |
| Other heavy oil ^f | EUR 47.36/1 000 litres | 13.5 |
| Liquefied petroleum gas used as a propellant | EUR 63.59/1 000 litres | 21.5 |
| Other liquefied petroleum gas ^f | – | 13.5 |
| Coal for electricity generation | – | |
| Coal for business use | EUR 4.18/tonne | 13.5 |
| Coal for other use | EUR 8.36/tonne | 13.5 |
| Natural gas | – | 13.5 |
| Electricity tax | | |
| Business use | EUR 0.50/MWh | 13.5 |
| Non-business use | EUR 1/MWh | 13.5 |
| Domestic use | – | 13.5 |
| Vehicle registration tax^g | | |
| Passenger cars | | |
| 0-120 g CO ₂ /km | 14% of OMSP ^h | 21.5 |
| 121-140 g CO ₂ /km | 16% of OMSP ^h | 21.5 |
| 141-155 g CO ₂ /km | 20% of OMSP ^h | 21.5 |
| 156-170 g CO ₂ /km | 24% of OMSP ^h | 21.5 |
| 171-190 g CO ₂ /km | 28% of OMSP ^h | 21.5 |
| 191-225 g CO ₂ /km | 32% of OMSP ^h | 21.5 |
| 226g CO ₂ /km and over | 36% of OMSP ^h | 21.5 |
| Car derived vans and jeep derived vans | 13.3% of OMSP ^h (min EUR 125) | 21.5 |
| Heavy good vehicles | EUR 50 | 21.5 |
| Motor tax^b | | |
| 0-120 g CO ₂ /km | EUR 104/year | .. |
| 121-140 g CO ₂ /km | EUR 156/year | .. |
| 141-155 g CO ₂ /km | EUR 302/year | .. |
| 156-170 g CO ₂ /km | EUR 447/year | .. |
| 171-190 g CO ₂ /km | EUR 630/year | .. |
| 191-225 g CO ₂ /km | EUR 1 050/year | .. |
| 226g CO ₂ /km and over | EUR 2 100/year | .. |

Table 6.8 Energy and transport taxes, 2009^a (cont.)

| | Rate | VAT ^b (%) |
|--------------------------------------------------|------------------|----------------------|
| Air travel tax | | .. |
| Short flights (up to 300 km from Dublin airport) | EUR 2/passenger | .. |
| All other flights | EUR 10/passenger | .. |

a) As of April 2009.

b) VAT for industry, commercial activities, automotive diesel for commercial use and electricity generation is refunded.

c) For commercial aviation: tax rebate of EUR 232.27/1 000 litres.

d) From 8 April 2009. The previous rate was EUR 368.05/1 000 litres.

e) Commercial aviation is exempted; excise duty applies only to private pleasure navigation.

f) Business and non-business use, including heating.

g) VRT and motor tax are based on engine size for cars registered before 1 July 2008 and motorcycles, and on unladen weight for heavy good vehicles.

h) Open market selling price: expected retail price, including all taxes. For each category, the minimum rate is set equal to the rate applied to EUR 2 000.

Source: Irish Tax and Customs; European Commission; OECD-IEA, *Energy Prices and Taxes*, 1st quarter 2009.

Tax concessions

Several exemptions apply to the mineral oil tax, including for *i*) coal used by households and for electricity generation, combined heat and power generation, agriculture, aquaculture and forestry, and mineralogical processes; *ii*) coal used by energy-intensive firms that hold a greenhouse gas emission permit (a half rate applies to non-energy-intensive firms with such a permit); *iii*) fuel for commercial aviation,²⁶ shipping and fishing navigation; *iv*) oil used in the production of mineral oil and alumina; *v*) electricity for household use, chemical reduction or electrolytic or metallurgical processes, and combined heat and power generation; and *vi*) electricity generated from renewable sources and combined heat and power plants. A number of partial exemptions, reduced rates and rebates also apply, including on fuel oil and diesel used in agriculture, building and mining. Under EU rules, Ireland qualifies for a full exemption of natural gas from excise duty. It is difficult to justify the exemption on domestic coal use for social reasons, since low-income households benefit from a lump-sum *fuel allowance* in winter to help with the cost of heating. In addition, a reduced VAT rate of 13.5% (against the standard rate of 21.5%) applies to fuel use, with the exception of motor fuels. The VAT on diesel purchased for business use can be claimed back from corporate tax, whereas the VAT on petrol is not regarded as a deductible business expense. These exemptions and discounts discourage efficient use of energy and create market distortions, notably among fossil fuels for electricity generation and heating, economic sectors and transport modes.

Since 2006, *biofuels* (pure plant oil, biodiesel and bioethanol) have benefited from full relief from the mineral oil tax on a competitive quota basis. Biofuel produced outside this programme is taxed at the same rate as petrol or diesel. It is estimated that, over the lifetime of the programme (2006-10), the tax relief will cost nearly EUR 220 million in forgone excise revenue and save 1.2 Mt CO₂. This implies a relatively high cost for the government budget per tonne of CO₂ abated (EUR 180/t CO₂), compared with the estimated cost of buying Kyoto carbon credits (EUR 15/t CO₂) (Chapter 8).²⁷ The full economic cost is even higher when environmental impacts are taken into account, including those linked to the production of biofuels from first generation feedstock. After the programme ends in 2010, it is to be replaced by a biofuel obligation. A reduced VAT rate of 13.5% applies to supply of miscanthus rhizomes, seeds, bulbs, roots and similar goods used for growing biofuel stock.

The VAT rate on *fertiliser* is zero for purchases above 10 kg. Since VAT on inputs is deductible from that on output, a reduced VAT rate has generally no impact on farmers' income. However, in Ireland, as in a number of European countries, small farmers can operate within a special VAT system, under which they are neither liable for VAT nor entitled to claim the tax paid on inputs, receiving a flat rate compensation instead of the VAT they cannot reclaim. Since for fertiliser the VAT is zero, farmers receive an implicit and highly non-transparent subsidy linked to fertiliser consumption (Copenhagen Economics, 2008). Pesticides benefit from a reduced VAT rate of 13.5%.

Ireland has one of the most favourable *tax treatments for housing* in the OECD: while mortgage interest payments and other costs relating to a house are deductible from income tax, there is no tax on property of first homes (private principal residences), or on capital gains when such a property is sold. The resulting tax distortions favoured housing over other assets and contributed to the housing bubble of the first half of the 2000s (OECD, 2008a). Moreover, property owners do not pay for the benefits of public investment in infrastructure which accrue through the increase in property values. These include expenditure on environmental infrastructure and services, such as wastewater treatment and public transport. In 2009, a flat charge on second homes was introduced. There should in addition be a gradual move towards a more neutral system of housing taxation, such as a property tax based on imputable rents or a reduction in mortgage interest tax relief (OECD, 2008a).

Businesses can offset service charges (including water and waste charges) against their tax bill. Since 1995, *income tax relief has been granted to individuals for service charges* paid to local authorities and to independent contractors. The abolition of domestic water charges in 1997 has meant the tax credit is applied mainly to domestic waste charges for collection and disposal, including fixed charges and "bin

tags". The relief is given at the standard rate of tax (20%), up to EUR 400. Nearly one-quarter of Irish households benefitted from this tax credit in 2006, at a cost to the national budget of over EUR 20 million. The Commission on Taxation, in its 2009 report, recommended ending this tax relief because it weakens incentives to reduce waste generation and increase waste recycling.

Subsidies

The government provides various types of *financial assistance* to enterprise in the form of capital grants and product subsidies. Over the review period, subsidies averaged 0.5% of GDP and capital grants 0.35%. Some support measures can have a harmful environmental effect, as they distort prices and resource allocation decisions. Ireland needs to regularly review its subsidies to verify that the rationale behind them remains valid and that the benefits are higher than the associated costs, including environmental costs. *Removing perverse subsidies* and tax concessions should be the first step in a comprehensive environmental fiscal policy reform, with a view to increasing cost-effectiveness of policy measures – particularly important at times of economic crisis – and getting to grips with climate change.

Electricity generation from peat is subsidised through a PSO: ESB is requested to purchase electricity generated from peat and is compensated for the extra cost incurred. The cost of the subsidy is distributed among electricity consumers, who are charged a PSO levy set by the CER. Between 2003 and 2006, the peat PSO cost Irish consumers some EUR 200 million (at 2006 prices). Since 2007, the levy has been set at zero, mainly because of over-recovery of costs in previous years. Peat-fired plants are subsidised primarily to maintain peat-harvesting jobs and limit dependence on fuel imports. Despite the upgrade of peat-fired plants, however, electricity generation from peat remains less efficient than that from other fuels, and associated air and carbon emissions are higher per unit of power produced. Moreover, the environmental impact of peat harvesting is severe (EPA, 2008a).

In addition to the total and partial exemptions from excise duties on aviation fuel, some *internal air routes have been subject to a PSO* and subsidised since mid-1990s.²⁸ Airlines servicing the PSO routes must operate a minimum number of flights per day/week, with a fare ceiling on a set of seats per flight. The cost of the PSO has been growing, both per passenger trip and in absolute terms, amounting to about EUR 15 million annually. For every euro a passenger pays, the Exchequer contributes between EUR 1 and EUR 5, depending on route. These subsidy rates are well above those available for other long-distance public transport modes carrying much higher traffic per year, and enable air carriers to offer lower fares than railways. The PSO air services provide passengers with limited time savings over bus and rail on the same routes (DKM, 2003). While these air services are valuable to the regions they serve,

further analysis is needed to assess whether the benefits are commensurate with the financial costs to the state as well as the environmental costs, especially given the growing impact of aviation on climate change.

In addition to the motor oil tax relief for biofuels, Ireland has subsidised *bioenergy crops*. The National Energy Crop Scheme has provided a premium of EUR 80 per hectare over 2007-09, in addition to the EU premium of EUR 45 per hectare available under the EU Energy Crops Scheme. Some 500 applicants have benefitted from this grant. The Bioenergy Scheme provides capital grants to farmers to cover up to 50% of the cost of setting a crop, with a maximum rate of EUR 1 450 per hectare. Since its introduction in 2007, some 220 farmers planting over 1 500 hectares have benefited from the grants.

2. Implementing Environmental Policy

2.1 Environmental planning and objective-setting

Following the adoption of the 1997 NSDS, *specific objectives on priority environmental issues*, along with quantified targets and steps to achieve them, have been identified in government-wide policy documents. These include the 1998 policy statement on waste management, the 2000 National Climate Change Strategy (revised in 2007), the 2001 National Hazardous Waste Management Plan (revised in 2008), the 2002 National Spatial Strategy, the 2002 National Biodiversity Plan, the 2004 National Waste Prevention Programme, the 2005 National Plant Conservation Strategy and the 2006 National Strategy on Biodegradable Waste. Most of the environmental objectives Ireland set in these documents reflected EU requirements.

Statements of Strategy issued every three years by the DoEHLG present an integrated approach to environmental management, key goals, the means required to achieve them, and performance measurement. The statements provide a framework for DoEHLG action across the range of its functions and its work with other government bodies and local authorities. They reflect priorities set out in the 2000-06 NDP, the Programme for Government and other cross-cutting government programmes (DoELG, 2001).

The 2007-13 NDP and the 2008 document “Building Ireland’s Smart Economy: A Framework for Sustainable Economic Renewal”, which presented a new strategy for addressing the economic downturn, identified environmental sustainability as a distinct, overarching development objective for the first time (DoT, 2008). Environmental priorities of the NDP were reiterated in the DoEHLG’s 2008-10 Statement of Strategy and “2020 Vision: Protecting and Improving Ireland’s

Environment”, issued by the EPA in 2007. The latter document set out six long-term environmental goals: *i*) limitation of, and adaptation to, climate change; *ii*) clean air; *iii*) protected waters; *iv*) protected soil and biodiversity; *v*) sustainable use of natural resources; and *vi*) integration and enforcement. It also listed detailed short- and medium-term actions to achieve the goals (EPA, 2007a).

Irish performance in implementing environmental policies can also be assessed against the relevant recommendations of the *2000 OECD Environmental Performance Review* (Table 6.9).

Table 6.9 **Progress in environmental performance**

| Recommendations related to implementation of environmental policy | Action taken since 2000 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none"> • extend the positive experiences of the <i>IPC licensing</i> scheme to a number of other activities not yet covered; • foster co-operation between <i>EPA and local authorities</i> in licensing and enforcement, <i>e.g.</i> through training and capacity building; • extend the use of <i>economic instruments</i> that help inform polluters and resource users of the true cost of their activities; • promote better integration of environmental concerns in sectoral policies, for example by using <i>environmental impact assessment</i> of plans, programmes and projects; • extend the range of environmental projects using <i>public-private partnerships</i>. | <ul style="list-style-type: none"> • The 2003 Protection of the Environment Act harmonised licensing with the EU IPPC Directive; the licensing system was broadened, and environmental requirements and procedure strengthened. However, some major operations are still not fully covered by the IPPC system. • The EPA established close relations with local authorities, including on oversight, guidance and capacity building for enforcement, in particular through the Environmental Enforcement Network. However, several local authorities lack staffing and are vulnerable to pressure from local interests. • The use of economic instruments has been extended, particularly in waste management and biodiversity. However, households continue to be exempt from both the capital and operating costs associated with delivering drinking water and collecting and treating sewage. • The application of EIA has been broadened to cover developments in sensitive environments and cumulative effects. However, Irish law is still not fully harmonised with the EU requirements and a number of projects, many in sensitive areas, escape EIA procedures. • Several initiatives, including producer responsibility and voluntary agreements between authorities and business, have contributed to environmental improvements, especially in air and waste management. |

Source: OECD, Environment Directorate.

2.2 *Legal and institutional framework*

Legal framework

A series of *laws and regulations* promulgated during the review period strengthened environmental management requirements and mechanisms. The key laws included the 2001 amendments to the 1996 Waste Management Act, which provided a legal mechanism for the elaboration of regional waste management plans; the 2000 Planning and Development Act, which required local authority development plans to include objectives for natural heritage protection and landscape preservation; and the 2003 Protection of the Environment Act, which strengthened the licensing and enforcement frameworks for air, water and waste management. The most recent, the 2007 Water Services Act, gave the EPA power to regulate drinking water provision by local authorities, which now must also obtain prior authorisation from the EPA to discharge effluents from their sewage treatment stations.

Many regulations harmonised the Irish legal system with the requirements of the EU directives. However, the *pace and scope of transposition of the EU legal framework*, along with the subsequent implementation, have been far from satisfactory. Delays occurred in nature and waste legislation and the requirements for environmental impact assessment. For example, in 2005, the European Court of Justice (ECJ) condemned Ireland for systematic disregard of provisions of the Waste Framework Directive, including those concerning safe disposal, an adequate network of disposal installations and permits for disposal operations. Ireland was also found to be breaching the Dangerous Substances Directive, in particular by lacking a proper system for authorising discharges from farm installations, marine fish farms, wastewater treatment plants and elsewhere. The number of EU environmental legislation infringement procedures against Ireland was among the highest in the European Union: by 2006 Ireland was subject to eight non-communication infringement procedures, seven non-conformity infringement procedures and 30 bad application procedures (EC, 2006a).

Although implementation of EU directives was accelerated as a result of the ECJ judgements, there is an urgent need to speed up *harmonisation of Irish environmental legislation with EU directives to avoid further ECJ cases*. Much of Ireland's legislation is in the form of regulations under a variety of laws. Consolidating the regulations into a coherent framework could simplify and clarify environmental requirements for the regulated community, enforcement agencies, local authorities and other stakeholders, and thereby help promote greater compliance.

Central environmental administration

The *DoEHLG* continued to oversee environmental management during the review period, although its functions were adjusted during a government restructuring in 2002: national heritage policy and nature and biodiversity conservation were brought into its portfolio²⁹ while responsibilities for road investment were moved to a new Department of Transport. Later the management of nuclear safety and *Met Éireann*, Ireland's meteorological service, were added to the *DoEHLG*'s functions.³⁰ Despite the transfer of the roads division, the *DoEHLG* now has more staff: its numbers rose from 950 to over 1 200.³¹ Its work is carried out through six divisions: Environment, Water and Planning, Heritage, Local Government, Housing, and Corporate Services.³²

The *EPA* supports environmental policy implementation through strategic environmental assessment, environmental licensing and enforcement, monitoring and reporting on the environment, and environmental research and development.³³ It is also in charge of quantifying Ireland's greenhouse gas emissions in the context of the Kyoto commitments and implementing the EU Emissions Trading Directive, which involves over 100 major generators of CO₂ in Ireland. The *EPA*'s 340 staff members (up from 250 in 2001) work in ten locations around the country.³⁴ In 2003, the *EPA* Office of Environmental Enforcement (OEE) was created to deal with illegal waste dumping and strengthen overall environmental compliance.

Institutional set-up at local level

Irish local administration consists of 34 "county-level" units (29 counties and 5 cities).³⁵ They are responsible for environmental regulation (licensing) and assuring compliance by small and medium-sized businesses with legislation on air, noise, planning, waste, wastewater and water quality. Local authorities also deliver services, such as housing, waste management, water supply and sanitation, under provisions in over 100 pieces of legislation. The *EPA* provides support, including guidance and capacity building, and carries out assessments of local authorities' environmental performance.

The *environmental management responsibilities of local authorities are evolving*. In waste management, local authorities have expanded their role from waste collection and landfill management to preparation of waste management plans, promotion of waste reduction and recycling, and control of illegal dumping. In many counties, local authorities have withdrawn from waste collection, instead regulating services provided by the private sector (Chapter 4). In water management, they must now obtain prior *EPA* authorisation to discharge effluents from their sewage treatment stations under the Water Services Act, which gave the *EPA* power to regulate provision of drinking water by local authorities.

The implementation of the EU Water Framework Directive (2000/60/EC) and the 2001 amendments to the 1996 Waste Management Act *enhanced co-operation among local authorities* regarding preparation of river basin plans and regional waste management plans (Chapters 3 and 4).

Local authorities possess little fiscal autonomy: central government provides a large share of *local authorities' capital and operating expenditure*. The largest contributions come from the DoEHLG's Local Government Fund, established under the 1998 Local Government Act.³⁶ Smaller sources of local income include taxes on commercial and industrial property, housing rent, borrowing, and service charges, including for waste collection. A broad review of the local government system and its funding, now under way, will present options for strengthening the operations of local authorities, including their financial basis.

2.3 Regulatory instruments

Integrated environmental permitting

Integrated pollution control licensing of activities with significant polluting potential had been well established since the introduction of the 1992 Environmental Protection Agency Act. The *2003 Protection of the Environment Act* harmonised this licensing with requirements of the EU directive on integrated pollution prevention and control (IPPC) so that it now covers a broader range of activities, such as intensive agriculture, milk processing, cattle slaughtering and wood industry (pulp, paper and board). The environmental requirements in permits were strengthened by applying best available techniques (BAT) based on the EU BAT Reference Documents (BREFs), as well as by introducing emission limit values, including for greenhouse gas emissions, and measures for energy efficiency and pollution prevention. The 2003 Act also introduced procedural changes, including provisions for the transfer, revocation or suspension of an IPPC licence, and extended the EPA's power to reject a licence application if the applicant fails to provide additional information within a specified period. In addition it empowered individuals to seek court orders against activities contravening licence conditions. Applications for an IPPC licence or for a licence revision or surrender are subject to administrative fees payable to the EPA. The fees range between EUR 2 000 and EUR 23 000, depending on the size and type of activity.

The EPA continues to *license certain media-specific activities*. In the waste sector, licences to regulate emissions and strengthen environmental management are granted to landfills, to waste transfer stations and to hazardous and other significant waste disposal and recovery activities. The EPA also issues permits to petrol storage

and distribution terminals for control of volatile organic compound (VOC) emissions. In water management, licensing of wastewater discharges from areas served by local authority sewer networks began in 2007 (EPA, 2009).

The *number of applications for IPPC permits* increased over the review period from 37 in 2001 to 123 in 2007, while the number of applications for waste management peaked in 2004 at 86 before gradually decreasing to 37 in 2007. Of the applications approved, around half had received objections. Until the end of 2008, the EPA issued 692 IPC/IPPC licenses, 242 waste licenses and 42 VOC permits. However, Ireland has not yet completed licensing of around 100 IPPC installations in the intensive agricultural sector of pig and poultry rearing, and in 2008 received a first written warning from the European Commission over failure to implement the IPPC Directive.

Efforts to *reduce the administrative burden of licensing* have brought results: only one licence is now required in cases where both IPPC and waste licences would be necessary, and a new format for registering waste, IPPC and VOC licences gives license holders and the public greater and easier access to information on applications. Progress is also being made towards implementing electronic IPPC and waste licence application procedures (EC, 2006b). In 2009, the government announced a consolidation of inspection programmes, beginning with those related to taxation, environment, health and safety, statistics, employment and company law. The aim is to reduce the number of inspection visits to businesses by 25% by 2012 (DoT, 2008).

In 2008, Ireland transposed the EU Environmental Liability Directive (2004/35/EC) into national law. The European Communities (Environmental Liability) Regulations, which came into force in April 2009, established a framework of environmental liability based on the polluter-pays principle to prevent and remedy environmental damage. Under the regulations, operators whose activities have caused environmental damage are financially liable for remedying this damage, and those whose activities may have caused an imminent threat of environmental damage are liable for taking preventive actions.

Enforcement and fostering compliance

The EPA evaluates *compliance with IPPC licences* through its specialised Office of Environmental Enforcement. The OEE was established in 2003 to deal with illegal waste activities, which had been widespread in early 2000s, and to strengthen enforcement capacity at central level in light of the additional requirements of IPPC licensing. The OEE is supported by the Environmental Enforcement Network (EEN) (Box 6.4).

Smaller scale and lower risk activities that do not require an IPPC licence (e.g. activities subject to the requirements of the EU Solvents Directive, 1999/13/EC, where organic solvents are used in quantities below the applicable IPPC threshold) must be registered with their local authority and obtain a certificate of compliance.

The EPA provides advice and support to local authorities in their enforcement functions. It may direct an authority to take a specific action within a specified time, for example, or issue binding decisions in cases of imminent risk of significant pollution. The EPA and EEN also assist local authority staff with experience sharing and capacity building. In 2007, *EPA audits of 15 local authorities* found that inspection plans and other statutory functions had generally been carried out well but that problems existed with tracking enforcement activities and responding to complaints (EPA, 2008b).

Enforcement activities include inspections, audits and monitoring visits, as well as ambient quality monitoring. Inspectors also evaluate proposals for new processes, work practices and infrastructure to assure compliance with Irish and EU legislation. Inspections are performed in accordance with the EU Recommendation on Minimum Criteria for Environmental Inspections and the OEE's 2003 Enforcement Policy. To prioritise enforcement activities, the EPA applies a methodology for assessing risk arising from licensed operations (EPA, 2006a).³⁷ Inspectors also review complaints about licensed facilities and work with licensees to make sure they communicate to individuals and local communities the measures they are taking to minimise any negative impact from their facilities. However, complaints associated with IPPC-regulated facilities decreased by nearly 60% (from over 1 000 to under 430) over the review period (EPA, 2009c).

The *administrative enforcement* powers available to the EPA include the frequently used informal warning letters (where a violation can be prevented) and legally binding statutory notices (if a violation needs to be remedied). In 2008, the EPA issued over 600 notifications resulting from over 1 300 incidents of non-compliance. This represented a drop in detected non-compliances over the previous years (EPA, 2009c). Rarely, if ever, is a permit suspended or revoked, actions reserved for cases of imminent risk or occurrence of serious environmental damage (LSI, 2007). On-the-spot fines are available but applied only in certain circumstances under health and safety legislation and the Litter Pollution Act. Local authorities have a similar array of administrative enforcement tools at their disposal. The publication on the EPA website of the details of non-compliance actions undertaken by the EPA has been used as a deterrence instrument.

Judicial enforcement can be initiated by the EPA or individuals. For example, individuals may apply to the Circuit Court or High Court in the event of non-

compliance with the licensing regime. The court may order the polluter to cover the clean-up expenses and other consequential losses, such as replacement of fish stocks. Regulatory bodies may also apply to recover costs incurred in remediation. Penalties for environmental non-compliance range from EUR 3 000 (and/or 12 months or more in prison on summary conviction) to EUR 15 million (and up to ten years' imprisonment on conviction on indictment for IPPC and waste licensing offences). For water, air and litter offences, they vary between EUR 1 300 on summary conviction and EUR 30 000 on indictment (LSI, 2007). Offences under the 2008 Environmental Liability Regulations can be subject to penalties ranging from EUR 5 000 (and/or six months or more of imprisonment on summary conviction) to EUR 500 000 (and/or three years or more of imprisonment on conviction on indictment). In 2006, the EPA set up a special investigation unit to support the prosecution of serious cases on indictment, following submissions to the Director of Public Prosecution. This work has been supported by investigative expertise on major crime from former members of An Garda Síochána.

The *number of prosecutions* has varied from 15 to 20 a year, with the average fine ranging from EUR 9 000 (2004) to EUR 20 000 (2008). Most charges relate to persistent breaches of emission limit values, failure to install pollution reduction equipment, false or misleading information, and failure to submit information or notify the EPA of incidents. The highest fine to date for breach of a licence was EUR 110 000 in 2006 against a pharmaceutical company, for air emissions up to 35 times the limit and emissions containing suspected carcinogens. In addition it had to pay remediation costs of EUR 42 000. Provisions allowing personal liability for responsible individuals also exist. Prison terms are rarely imposed but remediation costs can be high: in 2002 the High Court imposed orders on directors of a waste company, requiring them to meet an estimated clean-up bill of EUR 5 million if the company itself could not (Fanagan, 2007). A record fine of EUR 1 million was handed down in 2008 to a waste contractor for engaging in illegal waste activity.

Licensees are required by law to notify the EPA of any *pollution incidents* as soon as practicable.³⁸ The EPA has a permanent telephone emergency line available to receive notifications, which are not frequent. If any require investigation, the fact is published on the EPA website to alert the public. When investigations are completed, the incident notifications are updated, including any enforcement actions.

Through a wide-ranging campaign called “*See Something, Say Something*” the EPA disseminates information to the public on how to make an effective complaint about environmental non-compliance. The “Dump the Dumpers” service is designed to encourage reporting of illegal dumping of waste or of abandoned illegal dumps. Each notification is checked by the enforcement authorities, local authorities, the

Box 6.4 The Environmental Enforcement Network

The *role of the Environmental Enforcement Network*, established in 2003, is to improve co-operation among the various public service bodies involved in enforcement of environmental legislation. The EEN's principal functions are to *i)* coordinate enforcement activities of various agencies, *ii)* develop capacity to detect, investigate and prosecute environmental non-compliance, *iii)* develop a consistent approach to environmental enforcement throughout the country, *iv)* promote the use of best practices by local authorities by developing guidance material for compliance monitoring, inspection and prosecution and *v)* give feedback to policymakers and legislators on practical implementation of policies and regulations.

The EEN *brings together over 1 000 staff from more than 50 agencies*, including the EPA, local authorities, government departments, An Garda Síochána (the police, known as the Gardaí), the National Bureau for Criminal Investigations, the Northern Ireland Environment and Heritage Service, the Police Service of Northern Ireland, the Fisheries Boards, the Health Service Executive, the Revenue Commissioners and the Director of Public Prosecutions.

The *work is carried out through nine thematic working groups*, focusing on such issues as illegal waste dumping, water quality enforcement, enforcement management and producer responsibility. The working groups consist of key local and public authority personnel, EPA staff and representatives of other relevant government departments. The working groups analyse problems and agree how best to address them. Responses include direct enforcement, such as co-ordinated roadside and facility inspection involving several agencies, and building of enforcement capacity through preparation of guidance material or delivery of training to widen the network of practitioners. The outputs of working groups (*e.g.* guidance documents, protocols, training) are disseminated to public authority enforcement staff through the EEN and national conferences. Documents, as well as a shared calendar of events, are also available on the network website (www.enforcementnetwork.ie).

In a 2007 report, "Focus on Waste Enforcement", the EEN *presented results of actions to tackle illegal waste activities*. For example, a swoop on waste facilities and warehouses in December 2004 involved over 20 inspectors from the EPA and 40 from the Gardaí. Ten facilities were raided simultaneously, with additional raids conducted in Northern Ireland and Scotland. Increased co-ordination of enforcement activities on both sides of the border led to a major reduction in illegal trafficking of waste. In water management, the EEN facilitates better co-ordination through the development and implementation of catchment-specific enforcement plans. It also promotes better compliance by manufacturers and distributors with regulations on packaging and on waste electrical and electronic equipment. A solvents group is developing guidance to assure a consistent approach to enforcement of solvent regulations. The EEN also developed a procedure for dealing consistently with environmental complaints. It was disseminated to relevant authorities and the public. The European Commission acknowledged this activity as an appropriate response to rulings by the European Court of Justice.

OEE and An Garda Síochána (the national police) through the EEN (EPA, 2006b). A review of “Dump the Dumpers” indicated that 70% of calls were resolved and that about 75% of calls related to fly tipping or waste burning (EPA, 2009).

2.4 *Economic instruments*

The use of economic instruments, other than environmentally related taxes, has been on the rise. Particular progress has been made in *waste management*, where weight/volume waste collection charges were introduced on a wide scale from 2005 (Chapter 4). The charges consist of an annual flat fee for collection of a 2 40l bin (ranging from EUR 80 in Dublin to EUR 466 in Wexford) plus a volumetric fee (ranging from EUR 1.5 to EUR 13) (OECD, 2008). The use of charges increased the waste service cost recovery rate to 80% and contributed to expansion of collection and recycling infrastructure. Nationwide landfill and plastic bag levies, introduced in 2002, met their objectives of encouraging waste recovery and recycling, diverting waste away from landfills and reducing the use of plastic bags. Revenue from the levies (Table 6.6) has supported waste prevention/reduction programmes, enforcement of waste legislation and national and regional waste prevention campaigns. However, because the regulatory framework for waste collection is insufficient, the charging system has also triggered illegal dumping and backyard burning, especially in rural areas (Chapter 4).

Ireland has participated in the *EU Emission Trading Scheme for CO₂* since its launch in 2005. The ETS covers over 100 major industrial sites, in sectors including power generation, cement, lime, glass and ceramics, pharmaceuticals, semiconductors, food and drink, and oil refining. The EPA manages the National Emissions Trading Registry, serves as licensing authority for participating installations and oversees the monitoring, reporting and verification of emissions (Chapter 8).

In the area of *nature and biodiversity conservation*, financial instruments have been introduced to compensate landowners for income lost after designation of land as a protected area. However, the scope for cost recovery in nature conservation (e.g. through national park entry fees or licensing of commercial enterprises in parks) has not been fully explored (Chapter 5).

In the *water services sector*, a 1997 policy exempts households from paying for the capital and operating costs associated with delivering drinking water and collecting and treating sewage. However, commercial users pay the average operating cost of service provision as well as the marginal capital cost (beyond that necessary for service to households). Experience with water management in other OECD countries has demonstrated the benefits of water charges when all economic, social and environmental considerations are taken into account (Chapter 3).

2.5 Other instruments

Environmental impact assessment

Environmental impact assessment (EIA) of projects has been carried out in Ireland since 1990 under provisions of the Local Government Planning and Development Regulations which transposed the 1985 EU EIA Directive.³⁹ The 1997 amendments at European level, which resulted in new types of projects requiring EIA, were transposed into Irish law in 1999.⁴⁰ The 2006 Planning and Development (Strategic Infrastructure) Act further strengthened the EIA provisions, in particular in relation to EIA and public participation in cases of strategic infrastructure development where the Irish Planning Appeals Board (An Bord Pleanála) is the consent authority.

EIA procedures continue to be mandatory for projects listed in Annex I of the directive (power stations, oil refineries, waste disposal sites and integrated chemical installations) and for certain projects listed in Annex II which are above size thresholds set by the Irish regulations.⁴¹ In many cases, Ireland has adopted a *substantially lower threshold* than that in the directive. Peat extraction and other projects were added recently to Annex I and wind power for energy production and afforestation of previously unforested land to Annex II. As the location of developments in a sensitive environment and the cumulative effects of more than one project are also taken into consideration when screening projects for EIA, the local authority (or An Bord Pleanála) may require an environmental impact statement (EIS) to be prepared even if the development is below the thresholds. The EIS is subject to public consultation, and provisions are made in respect of transboundary impacts. The EIS submitted as part of the application for planning permission must contain information on the factors listed in Article 3 of the EIA Directive and the inter-relationship between those factors. If the EIS does not contain this information, the planning authority must require the applicant to submit further information in order to assure compliance. In 2003, the DoEHLG published a *guidance document on EIS preparation* to help planning and other authorities decide if significant effects on the environment are likely in development below the national mandatory EIA thresholds.

The Irish EIA legislation mirrors many mandatory requirements of the EIA Directive, but it does not appear to cover all requirements. On several occasions the *ECJ has rendered judgements against Ireland* because its national EIA law falls short of EU requirements. In 2008 the ECJ upheld the European Commission's claim that Irish law did not contain a watertight obligation to assess certain types of agricultural development and fish farming. Moreover, the screening for EIA has not been effective and some environmentally detrimental developments have taken place in sensitive areas without EIA. For example, the ECJ condemned Ireland for failing to carry out a full EIA on a wind farm development in Derrybrien that resulted in a bog slide.

Following public complaints and the ECJ rulings, the DoEHLG began engaging actively in efforts to address legal gaps in the transposition of the EIA Directive. Among other actions, it introduced regulations that further reduced certain EIA eligibility thresholds, including for peat extraction; removed the exemption for demolition works where such works, should they be part of a larger development, would have required EIA; and brought certain private roads within the scope of the directive.

Promoting environmental performance of industry

Voluntary approaches have been used in Ireland in environmental management and energy efficiency efforts. *Repak*, which in 1996 became Ireland's first voluntary initiative, expanded during the review period. In particular, it helped Ireland meet and then exceed its EU packaging recovery targets in 2001 (25%) and 2005 (50%), bringing packaging recycling close to 60% in 2007 (from under 15% in 1998). Over 2 000 companies are members, and Repak funds the recycling of over 60% of all packaging on the Irish market. Similarly, the *Large Industry Energy Network* has grown from a 1993 pilot project involving energy efficiency efforts in 10 companies to an 85 member Energy Agreements Programme (SEI, 2008).⁴²

New agreements introduced over the review period include *i*) a 2002 commitment by importers and distributors of solid fuel to reduce the sulphur content in coal and petroleum coke and to extend the ban on the marketing, sale and distribution of bituminous coal in urban areas (Chapter 2); *ii*) a 2006 negotiated agreement between the DoEHLG and the chewing gum industry for a EUR 7 million three year programme, funded entirely by industry, to tackle chewing gum litter; and *iii*) a 2007 agreement between the DoEHLG and the Irish Banking Federation aimed at reducing litter from ATM slips. Achievements of these agreements are recognised and contribute to national environmental and energy objectives on efficiency, competitiveness, energy security and environmental protection. They mostly involve large companies, many operated by major multinational firms, capable of meeting high environmental standards.

Several initiatives *support small and medium-sized facilities*, which have less capacity for environmental management systems. The support focuses on development of environmental technology and eco-innovation. Enterprise Ireland, through its Environment and Green Technologies units, provides direct financial support that helped smaller Irish companies promote eco-efficiency in their operations.⁴³ These efforts are complemented by information-based measures such as *i*) the Envirocentre website, which provides up-to-date information on a range of environmental issues relevant to industry; *ii*) regional industrial environmental forums aimed at smaller firms; and *iii*) technical advice to client companies from in-house experts in various environmental fields.

Over 2000-06, the EPA funded environmental research with nearly EUR 40 million from the Environmental Research, Technological Development and Innovation programme. The research has led to the filing of patents for new products and technologies, licence agreements, non-disclosure agreements and new spin-off companies (EPA, 2006c, 2009b). Efforts will continue over 2007-13 under a reinforced successor programme, STRIVE, which in 2008 alone awarded over EUR 10 million for 30 eco-innovation projects. STRIVE provides support to *i*) researchers and innovators in the environmental technologies sector and *ii*) businesses participating in its Cleaner, Greener Production Programme, which was selected as exemplary in the 2007 EU review of eco-innovation programmes.⁴⁴

The *environmental goods and services sector* in Ireland is relatively small, employing an estimated 6 500 persons, and has not matched the success of other high-growth sectors, such as biotechnology or information and communications technology. The market is estimated at EUR 2.8 billion, with exports worth EUR 106 million in 2006 (Forfás, 2008). Smaller firms dominate, with subsidiaries of UK and EU companies offering environmental consultancy services and competing in key sectors such as waste management. Because of the potential for further development (the Department of Enterprise, Trade and Employment estimates that exports of environmental goods and services will reach EUR 650 million and that the sector will employ around 10 000 people by 2020), several government programmes support the sector. Both Enterprise Ireland and IDA Ireland, which promotes investment in Ireland, established environmental goods and services departments to support an expanding portfolio of start-up companies in the waste, water and energy sectors. Science Foundation Ireland's remit was recently extended to include sustainable energy and energy-efficient technology. A high-level group, established to advise on the development of green enterprise in Ireland, is expected to identify priority actions for providing new, quality employment opportunities in this growing sector.

Demand for environmental products, services and technologies will increase as cost savings and business-to-business supply chain pressures increasingly become key factors in motivating eco-innovation. Recognising these links, Ireland's National Roadmap for the Implementation of the EU Environmental Technology Action Plan was adopted in 2006. It emphasises improving competitiveness and economic benefits of Irish companies and bridging the gap between research and the market place. However, additional efforts are needed to stimulate eco-innovation and the environmental goods and services sector. These should include consistent enforcement and implementation of environmental legislation, the greening of Ireland's EUR 10 billion public procurement budget and additional financing for start-up projects. The last is recognised in the Framework for Sustainable Economic Renewal, which set out the Irish Government's response to the worsening economic

situation in 2008. It includes a EUR 500 million venture fund, known as Innovation Fund – Ireland that would put particular focus on helping small, early-stage, R&D-intensive firms take advantage of opportunities for wider application of renewable energy and environmental technology (DoT, 2008).

2.6 Environmental expenditure

Public pollution abatement and control (PAC) expenditure increased by 63% in real terms during the review period. However, public PAC expenditure continues to represent a small share of GDP (0.7% in 2007) and the share of public expenditure devoted to environmental protection has steadily declined since 2001 (Table 6.10). Investment represents about 37% of public PAC expenditure, down from 44% in 2000. Expressed as share of Ireland's gross fixed capital formation, public PAC

Table 6.10 **Public environmental expenditure,^a 2000-07 (EUR million)**

| | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 |
|---------------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Total public PAC expenditure | 529 | 637 | 686 | 692 | 709 | 713 | 785 | 868 |
| <i>of which:</i> | | | | | | | | |
| Waste management | 223.5 | 266.0 | 338.7 | 375.2 | 399.0 | 384.6 | 393.1 | 430.5 |
| Wastewater management | 288.5 | 353.9 | 329.0 | 298.1 | 292.4 | 311.3 | 375.3 | 419.4 |
| Air management | 17.1 | 16.6 | 18.5 | 18.4 | 17.8 | 16.8 | 17.0 | 18.4 |
| Total public PAC investment | 231.8 | 299.9 | 314.8 | 259.3 | 226.0 | 249.1 | 284.0 | 326.3 |
| <i>of which:</i> | | | | | | | | |
| Waste management | 32.3 | 45.6 | 81.1 | 73.3 | 72.7 | 78.4 | 81.5 | 93.6 |
| Wastewater management | 198.5 | 252.8 | 231.1 | 183.6 | 151.0 | 168.1 | 200.0 | 229.9 |
| Air management | 1.0 | 1.5 | 2.6 | 2.4 | 2.4 | 2.6 | 2.4 | 2.8 |
| Other public environmental expenditure ^b | 22.5 | 30.9 | 26.1 | 25.4 | 27.6 | 28.5 | 30.9 | 33.0 |
| Public PAC expenditure/GDP (%) | 0.5 | 0.58 | 0.6 | 0.6 | 0.62 | 0.6 | 0.63 | 0.67 |
| Public environmental expenditure/GDP (%) | 0.53 | 0.61 | 0.63 | 0.62 | 0.64 | 0.62 | 0.65 | 0.69 |
| Public environmental expenditure/total public expenditure (%) | 1.67 | 1.71 | 1.63 | 1.54 | 1.47 | 1.36 | 1.36 | 1.33 |

a) At constant 2000 prices.

b) Environmental R&D and other environmental expenditure; no data available on water supply.

Source: Eurostat, Government Expenditure by Function (COFOG).

investment expenditure is fairly high by OECD standards at 4.2% in 2007, reflecting an ongoing, large-scale investment plan to fill Ireland's environmental infrastructure gap. The bulk of public PAC investment is devoted to wastewater management (70%), but overall public PAC expenditure, including operating costs, is almost equally divided between the waste and wastewater sectors.

Compared to many OECD countries, much more of Ireland's public expenditure on environmental protection is spent at local level – over 90%. The share of *local government budgets* devoted to environmental protection substantially increased, from 3.6% in 2000 to 9% in 2007. Reasons for this strong growth include the demands of a fast-growing economy and rising population. However, relative to other OECD countries, there is little local fiscal autonomy and the share of subnational revenue (as part of total government revenue) is very small (OECD, 2008b). All local authorities raise revenue from commercial and domestic waste charges, commercial water charges, housing rents, parking charges and planning application fees, with autonomy in setting the rates on most of these. Several reports over the last two decades have recommended an extension of local tax autonomy (OECD, 2008a). Some measures to this end have been taken in recent years. The 2009 budget introduced a charge of EUR 200/year on second homes, which is collected by local authorities and is expected to yield EUR 40 million a year to help cover local operating costs.

The central government fills the fiscal gap with grants, which are particularly important in rural areas. The largest *mechanism for grants from the central government* is the Local Government Fund (general purpose grant). Part of the DoEHLG's budget, it is partly funded by motor tax proceeds. The DoEHLG also manages the Environment Fund, which is funded by the levies on plastic shopping bags and landfills (Chapter 4). Other government grants target water services infrastructure and housing.

Notes

1. The difference between GDP and gross national income (GNI) is fairly large, reflecting the high level of transnational corporation activity on Ireland's territory. In terms of GNI per capita, which might be a more accurate measure of living standards in Ireland, the country was ranked fifth in Europe in 2007.
2. By some estimates, in 2008 Irish eco-industry (environmental goods and services) generated turnover of EUR 2.8 billion and accounted for the equivalent of more than 6 500 full time jobs in direct employment (Forfás, 2008).
3. Significant abstractions are defined here as those greater than 10 m³/day or serving more than 50 people.
4. DMC is the total mass of material directly consumed by the economy in a given year. DMC equals domestic extraction of resources plus imports minus exports, including processed products for imports and exports. Domestic extraction is the flow of raw materials extracted or harvested from the environment and used by the economy as material factor inputs.
5. While GDP grew considerably in the first half of the 2000s, the DMC of fossil fuels (measured in mass units) was fairly stable, meaning that the material productivity of fossil fuels increased. The shares of fossil fuels in TPES and TFC (measured in energy units) decreased slightly but are still higher than the respective OECD Europe averages.
6. The secretariat has eight staff members, including the chairperson. Its budget comes from DoEHLG funding.
7. Comhar began its third term in January 2006. The third work programme established working groups on *i*) biodiversity; *ii*) climate change; *iii*) awareness, education and communication of sustainable development; and *iv*) the National Development Plan, National Sustainable Development Strategy and indicators. Comhar's bureau oversees progress on the work programme. The council hosted conferences on "Towards Sustainability in the National Development Plan 2007-13" in 2006, "Making It Happen – towards a Sustainable Ireland" in 2007 and "Implementing Sustainable Development: Empowering Local Communities" in 2008.
8. The Irish Public Service is composed of a civil service (staff of departments and major agencies); commercial and non-commercial bodies that provide services on behalf of the state, such as agencies, public hospitals, schools, and defence and security services; and local government.
9. A RIA should examine whether a proposal involves a significant policy change in an economic market and assess the potential impact on national competitiveness, consumers, socially excluded and vulnerable groups, environment, rights of citizens, compliance burden, and other economic, social and environmental costs and benefits. The RIA report accompanies the draft legislation.
10. In 2007, progress on the NSDS was partially assessed within the first national implementation report on the EU Sustainable Development Strategy.
11. The total value of the Community Support Framework 2000-06 embedded in the NDP was about EUR 6.4 billion, of which nearly half was EU funding (structural and cohesion funds) and the rest was national matching funds. EU co-financing represented a smaller share of

available resources than under previous NDPs, reflecting both the lower amount of EU funding available to Ireland and the expanded scope of the NDP.

12. Public transport developments included extending the Luas light rail system in Dublin, doubling peak capacity on the DART line, increasing the Dublin Bus and Bus Éireann fleets, upgrading about 760 km of rail network and some rolling stock (600 additional seats were made available) and implementing the rural transport initiative in virtually all counties, with over 650 000 passenger trips per year. Concerning the water sector, over 100 wastewater treatment projects were completed, with additional capacity for 3.1 million population equivalent. The water supply network was developed (55 water supply schemes) and upgraded, partly to control for leakage. In rural areas over half a million people benefited from these projects.
13. This is more than the GDP in 2006, when the plan was approved. The NDP includes an EU contribution of EUR 3 billion dedicated to the regional operational programmes.
14. The spatial strategy envisages a regional development pattern based on “gateway centres” that drive the development of their wider regions, including surrounding towns, villages and rural areas. The gateways are Dublin, Cork, Galway, Limerick/Shannon, Waterford, Sligo, Dundalk, Letterkenny/Derry and Athlone/Tullamore/Mullingar.
15. The market share of the largest power generator decreased from 98% in 2000 to 48% in 2007.
16. The programme involved grant assistance for a total of 5 528 dwellings using techniques resulting in a 40% improvement in energy performance compared with the 2005 building regulation standards.
17. The regulations had been previously amended in 2002 to tighten the insulation standards for new buildings, aiming at avoiding 300 000 tonnes of CO₂ emissions per annum by 2012.
18. Commission Regulations No. 244/2009 and 859/2009 implementing Directive 2005/32/EC on ecodesign requirements for non-directional household lamps.
19. KEMA (2008) estimated the potential savings at 25 640 GWh, equivalent to 26% of the baseline energy use. The residential sector would account for 46% of the savings.
20. The earlier programme was a competitive tendering system in which the developers that bid the lowest price got the contract to supply electricity at that price. It was launched in 1995 and six competitions were held. However, developers were often unable to operate at the low price they had bid to win the contract, and many new projects were abandoned (IEA, 2007).
21. The feed-in tariffs per kWh published in 2005 (afterwards indexed to the annual change in the national consumer price index) were EUR 0.057 for large wind energy (over 5 MW installed capacity), EUR 0.059 for small wind energy (5 MW or less), EUR 0.07 for biomass (landfill gas), EUR 0.072 for small hydro (less than 5 MW) and other biomass technologies, and EUR 22 for ocean energy (wave and tidal) without indexation.
22. The 2008 All-Island Grid Study indicate that a 36% share of renewables in electricity generation capacity by 2020 would be feasible, provided over 700 km of transmission network were to be developed at a cost of nearly EUR 700 million.
23. These OECD Environment Directorate estimates are based on *i*) the additional tax revenue expected in a full year of implementation (EUR billion 2.1 from the 2009 budget and EUR billion 3.6 from the 2009 supplementary budget), net of duplication (*e.g.* the income taxation package); *ii*) expected yield of the environmentally related taxation measures included in the 2009 budget (Table 6.7); and *iii*) the OECD estimate of Ireland’s 2009 GDP.
24. The number of newly registered cars with engine size above 1 900cc has been growing since 2000 (from about 6 350 in 2000 to nearly 37 000 in 2007); the share of smaller cars, up

- to 1 400cc, decreased from 80% of newly registered cars in 2000 to 34% in 2007, showing the shift towards more powerful cars.
25. The implicit tax rate on energy is the ratio of energy tax revenue to final energy consumption. This indicator is calculated and published by Eurostat.
 26. Aviation is a tax-free activity in most countries. Only a few OECD countries tax jet fuel used in domestic aviation.
 27. The government set aside EUR 270 million in a “carbon fund” to buy 18 MtCO₂ eq of international carbon credits over the Kyoto commitment period (2008-12).
 28. The introduction of the PSO for air services was a response to the liberalisation of air transport in Europe, which led to a loss of business for some Irish regional airports.
 29. The National Parks and Wildlife Service, which oversees nature and biodiversity, was transferred to the DoEHLG from the Department of Arts, Heritage, Gaeltacht and the Islands (now Community, Rural and Gaeltacht Affairs).
 30. Under the government formed in 2007, responsibilities related to non-national roads and the National Vehicle and Driver File were transferred to the Department of Transport; and it was announced that functions related to marine foreshores had been transferred to the DoEHLG from the Department of Communications, Marine and Natural Resources (now Communications, Energy and Natural Resources).
 31. The DoEHLG portfolio also includes regional development, planning and housing, and support to local authorities. It is responsible for major infrastructure development, notably regarding water services and housing, and about 90% of its spending is channelled through local authorities.
 32. As part of the government decentralisation process, 320 DoEHLG staff members are expected to be moved to Wexford by the end of 2009.
 33. The EPA is an independent public body established under the 1992 Environmental Protection Agency Act. It is managed by a full-time board consisting of a director general and four directors, assisted by an advisory committee of twelve members who meet several times a year to discuss issues of concern and offer advice to the board.
 34. The EPA has its head office in the Johnstown Castle Estate in County Wexford and regional offices or inspectorates in Dublin, Cork, Kilkenny, Castlebar, Monaghan, Letterkenny, Athlone, Limerick and Mallow.
 35. The cities are Dublin, Cork, Limerick, Galway and Waterford, which are administered separately from the remainder of their respective counties. A second local government tier consists of 75 towns and 5 boroughs (Clonmel, Drogheda, Kilkenny, Sligo and Wexford, which have some autonomy within their counties). Eight regional authorities promote coordination between local authorities and other public authorities on the provision of public services. Two regional assemblies, established in 1999, promote co-ordination of public service provision, manage regional operational programmes in the Community Support Framework (CSF) and monitor the general impact of EU programmes under the CSF.
 36. The fund receives the full proceeds of the motor tax and a contribution from the central government budget.
 37. The methodology is based on five criteria: *i*) complexity of the activity, *ii*) level and type of emissions, *iii*) location of the activity, *iv*) operator management standards and *v*) enforcement/compliance record. Within each criterion, a list of factors that contribute to risk is developed and risk assessed. The scores are aggregated to arrive at an overall risk category for that facility.

38. These can include emissions not complying with the licence requirements, waste amounts exceeding the daily duty capacity of waste handling equipment, cases in which a trigger level specified in the licence is attained or exceeded and any indications that pollution has, or may have, taken place. Details regarding reporting of environmental incidents are contained in the EPA's Guidance to Licensees on the Notification, Management and Communication of Environmental Incidents.
39. Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment.
40. Provisions of the revised EIA Directive (97/11/EC) were introduced into Irish law by the 1999 European Communities (Environmental Impact Assessment) (Amendment) Regulations and the 1999 Local Government (Planning and Development) Regulations.
41. Examples of thresholds above which EIA is required are 70 ha for afforestation and 50 ha for peat extraction. The Planning and Development Regulations contain the full list of projects and threshold limits.
42. The Energy Agreements Programme, launched in 2006, centres on a commitment to adopt Irish Energy Management Standard IS393 to provide continuous and sustained improvements in energy efficiency. Companies also commit to complete three audits focusing on the viability of new energy-efficient technology or changes to core processes in energy-intensive areas.
43. Enterprise Ireland is a government agency responsible for developing and promoting Irish business.
44. The EPA Cleaner Greener Production Programme contributes to environmental protection and industrial/enterprise development. Results from 2005-08 show that from an initial EPA investment of EUR 1 million, participant organisations have leveraged more than EUR 1.6 million a year in cost savings, along with reductions of more than 250 000 tonnes of water and 660 MWh of energy.

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