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Working Group on the State of the Environment

TOWARDS MORE SUSTAINABLE HOUSEHOLD CONSUMPTION PATTERNS

INDICATORS TO MEASURE PROGRESS

English text only

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FOREWORD

In recent years, the debate about the environmental consequences of economic growth, and about the importance of sustainable development, has moved up the international agenda. It has been reinforced by trade liberalisation and increasing globalisation of the world economy.

Consumption by households and government is one determinant of sustainable development and its economic, environmental and social dimensions. It has important implications for the level and pattern of production and for related demands for natural resources. Growth of private consumption has both positive and negative environmental effects. On the one hand it entails increased use of private transport, more leisure and tourism, higher consumption of resources including energy and land, increased use of packaged goods and higher waste production. On the other hand it also stimulates the demand for environmentally-friendly goods and for a high-quality environment.

Agenda 21, endorsed by UNCED (Rio de Janeiro, 1992) identified unsustainable consumption and production patterns, particularly in industrialised countries, as the major cause of the continued deterioration of the global environment.

OECD countries are collectively the biggest users of natural resources in the world and the environmental, economic and social consequences of the consumption patterns of their population and related economic activities extend far beyond their borders. From an environmental point of view, they exert three major types of influences within and outside the OECD area. Firstly, on the rate of extraction of non-renewable resources such as oil and minerals. Secondly, on the extent of harvest of renewable resources such as forests, agriculture, and wildlife. And thirdly, on the intensity of environmental stress associated with production, consumption and use of resources. Consequently, OECD countries have the potential to take the lead in achieving more sustainable consumption patterns.

It is therefore essential that effective environmental policies are developed and implemented, and that environmental aspects are taken into account in economic and sectoral policies. It is further essential that these policies are based on appropriate factual information, and that the public is informed about the results of these policies. In this context, environmental indicators have been proven to be powerful and informed decision making tools.

The OECD work programme on environmental indicators includes several sets of indicators: an OECD Core Set of environmental indicators that is common to all member countries and various sets of indicators to integrate environmental concerns in sectoral policies (e.g. energy, transport, agriculture) that supplement the Core Set. Indicators are also derived from natural resource and environmental expenditure accounts.

The present report is one of the products of this OECD work programme on environmental indicators and supports the OECD work programme on sustainable consumption. It highlights the interactions between household consumption patterns and environmental issues, and provides one of the building blocks for sustainable development indicators. The indicators cover major economic and socio-demographic trends, and key household consumption trends having an environmental significance.

This report was prepared by the OECD Secretariat and has benefited from close co-operation with the UN Commission on Sustainable Development (UNCSD). It is intended to stimulate discussions and initiatives concerning sustainable consumption indicators in Member countries, and to contribute to related international work. Its successful completion depended on personal or official contributions by individuals in Member countries, and on the work and support of the OECD Working Group on the State of the Environment. This report is published on the responsibility of the Secretary General of the OECD.

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EXECUTIVE SUMMARY

This report is part of the OECD work programmes on environmental indicators and on sustainable consumption. It further contributes to the OECD-wide project on sustainable development indicators. It builds on:

- earlier work of the OECD Working Group on the State of the Environment on indicators for integrating environmental concerns into sectoral policies;
- ongoing OECD work on sustainable consumption patterns; and
- related work in other international institutions, and in particular on UNCSD work on measuring changes in production and consumption patterns.

This report has been prepared in close co-operation with the UN Division for Sustainable Development through an early and mutual consultation.

POLICY CONTEXT

Consumption by households and government is a determinant of sustainable development and its economic, environmental and social dimensions. It has important implications for the level and pattern of production and for related demands for natural resources. Growth of private consumption has negative and positive environmental effects. It entails increased use of private transport, more leisure and tourism, higher consumption resources including energy and land, increased use of packaged goods and higher waste production. It also stimulates the demand for environmentally-friendly goods and for a high-quality environment, e.g. in tourist areas.

Various forces shape consumption and related production patterns. These include structural economic and socio-demographic changes, sectoral trends, land-use patterns, infrastructure, capital flows, and technological change. Consumption patterns in OECD countries further interact with globalisation and international trade flows. Social factors, including values and learned habits, also play an important role.

Changing consumption patterns to ensure more sustainable development requires a decoupling of standards of living from resource inputs and can be promoted by further integrating environmental and sustainability concerns into public and private decision-making. Getting the prices right and internalising external costs through the use of economic and/or regulatory instruments are key policy elements. Governments can show the way by "greening" their own consumption and operations.

CONCEPTS AND DEFINITIONS

For the purpose of this report, consumption is defined as the final consumption activity of households (including the production of recyclable inputs) and governments, as opposed to production that is undertaken by firms (including input use). The definitions used are those of the national accounts system.

There is no unique way to define sustainable consumption. The 1994 Oslo Ministerial Roundtable produced the following working definition: "*the use of services and related products which responds to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations*". This definition is not operational, however, unless one can determine whether the consumption of any particular good, service or natural resource is sustainable or not. In practice, sustainable consumption has to be interpreted in a pragmatic way. It is understood to include a range of changes, such as greater efficiency in the final consumption of energy and resources, minimisation of waste, and more environmentally-sound purchasing habits of households and governments.

Measuring progress towards more sustainable consumption requires a good understanding of how the related driving forces and policy instruments interact, as well as appropriate analytical tools and a good knowledge of underlying concepts and definitions. Among the potentially useful tools are structuring elements, such as consumption clusters, and accounting frameworks such as national and environmental accounting.

Assessing the sustainability of consumption further requires some understanding of environmental limits within which consumption can take place. Concepts such as carrying capacity or ecological footprints could be useful in this respect, but require further development before they can be measured. They are not used in this report.

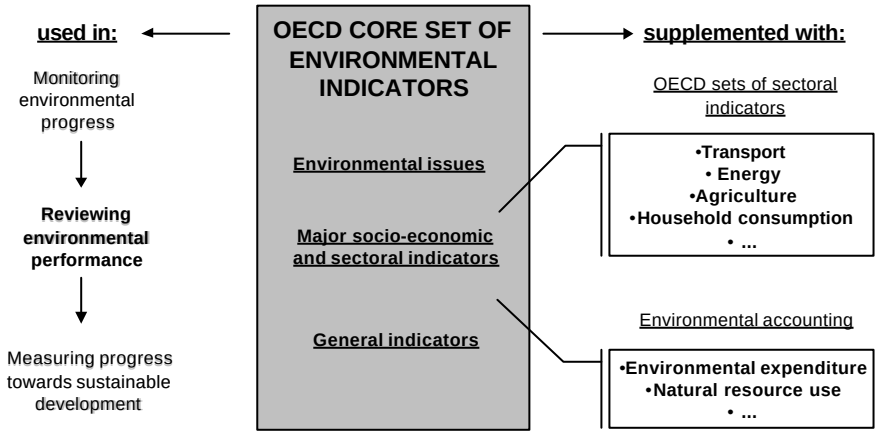
INDICATOR FRAMEWORK

PURPOSE AND CHARACTERISTICS

The indicators presented in this report are intended to:

- highlight the interface between consumption patterns and environmental issues, and in particular help to better understand how different driving forces and policy instruments interact and affect the environmental sustainability of consumption;
- contribute to the further integration of environmental and sustainability concerns into decision making and to provide a basis for monitoring related policies; and
- stimulate discussions and initiatives concerning sustainable consumption indicators in Member countries, and contribute to related international work (e.g. UNCSD).

Like other OECD sets of sectoral indicators, sustainable consumption indicators are developed in relatively large numbers. They provide a "tool kit" for decision-makers and supplement the OECD Core Set of environmental indicators, which includes major core indicators.



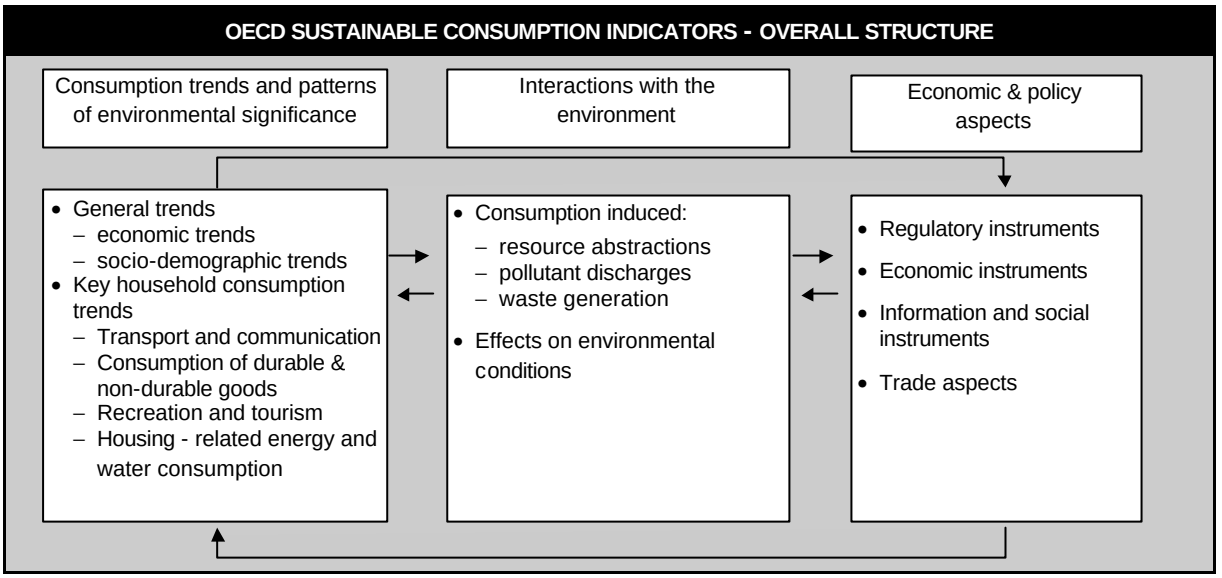
All indicators are reviewed according to their policy relevance, analytical soundness and measurability.

STRUCTURE

The framework adopted to structure sustainable consumption indicators resembles that of other OECD work on sectoral indicators. It is based on an adjusted pressure-state-response (PSR) model. The proposed indicators are structured around three themes:

- Environmentally significant consumption trends and patterns (i.e. major driving forces and indirect pressures), including economic and socio-demographic trends and key household consumption trends (transport and communication; consumption of durable and non-durable goods including food, recreation and tourism, housing-related energy and water use).

- Interactions between consumption patterns and the environment (i.e. direct pressures on the environment and on natural resources and related impacts) including consumption-induced resource abstractions and pollutant and waste discharges, and related effects on environmental conditions.
- Economic and policy aspects covering key policy and other societal responses (regulatory instruments, economic instruments, information/social instruments), as well as trade aspects.



SCOPE AND LIMITS

The OECD work distinguishes itself by focusing on the demand side and on household consumption patterns. Emphasis is given to final consumption as opposed to intermediate consumption and production, which is undertaken by firms. It thus complements existing work focusing on the supply side (production).

Aspects of sustainability other than the environment, such as social and economic sustainability, are taken into account, but are not the specific focus.

All indicators refer to the national level and are designed to be used in an international context. Within a country a greater level of detail or breakdown may be needed. The actual measurement of indicators at these levels is encouraged and lies within the responsibility of individual countries.

The indicators are not designed to provide a full picture of the relationships between consumption patterns and environmental issues, but rather to help reveal trends and draw attention to phenomena or changes that require further analyses and possible action. They need to be supplemented with additional information and interpreted in context to acquire their full meaning.

MEASURED INDICATORS

Those indicators for which data are currently available for a majority of OECD countries are presented in Part III of this report. They will be used as a short term tool for current OECD work on sustainable consumption patterns. Other indicators need further work and will be available in the medium or long term.

In order to ensure consistency with the OECD work programme on sustainable consumption patterns, and with related UNCSD work, the measured indicators are grouped by general socio-economic trends and by key household consumption activities. They relate directly to 10 out of the 25 UNCSD indicators for consumption clusters, and 4 out of 9 UNCSD core indicators.

GENERAL TRENDS	
a. Economic trends	♦ Public and private final consumption expenditure
	♦ Saving rates
	♦ Consumer price indices
b. Socio-demographic trends	♦ Population structure
KEY HOUSEHOLD CONSUMPTION ACTIVITIES	
c. Transport and communication	♦ Passenger traffic (road) and car stocks
	♦ Air emissions from transport
	♦ Consumption of road fuels and related prices and taxes
	♦ Communication tools: newspapers, telephone lines, computers, internet connections
d. Consumption of durable and non-durable goods	♦ Household consumption expenditure by type of good (durable, non-durable, services)
	♦ Paper consumption and recycling rates
	♦ Food consumption
	♦ Household (municipal) waste generation and management
e. Recreation and tourism	♦ International tourist receipts
f. Housing related energy and water use	♦ Energy consumption intensities & energy prices for households
	♦ Air emissions from residential energy use
	♦ Water abstractions and prices for public supply
	♦ Population connected to waste water treatment plants

DATA AND INTERPRETATION

The data used to calculate the indicators are from OECD sources and from other international sources. Environmental data are based on those published in "OECD Environmental Data — Compendium 1997" and in "Towards Sustainable Development — Environmental Indicators". Country replies to the 1998 OECD questionnaire on the state of the environment, as well as country comments have been used for further selected updates.

Interpretation of the indicators, i.e. interpretation of consumption trends and patterns, has not been attempted and has been left for subsequent analysis as part of the OECD work programme on sustainable consumption. Nevertheless, most indicators display considerable variations of consumption trends and patterns, and suggest considerable room for policy action.

PROSPECTS AND FUTURE WORK

All indicators are viewed in a dynamic context: they are not necessarily final in character, and may change as analytical knowledge and other international work progresses.

It is expected that further refinement of the indicators will be needed to support the OECD Sustainable Consumption Work Programme, and in particular, its sector case studies on food, electronic commerce and transport, housing and tourism. The indicator set may also evolve in response to the development of the conceptual policy framework for examining consumption patterns.

PART I. INTRODUCTION

OECD WORK ON ENVIRONMENTAL INDICATORS

MANDATE

Work on environmental indicators in the OECD has been ongoing since 1989/90. It derives its mandate from several international requests:

- In 1989, the OECD Council meeting at Ministerial level called for a next generation work programme on environmental economics that would integrate environment and economic decision-making more systematically and effectively. This was reiterated during several G-7 Economic Summits, as well as by the meeting of the OECD Environment Committee at Ministerial level in 1991.
- More specifically, a 1991 Recommendation of the OECD Council on Environmental Indicators and Information included a call for further development of "*reliable, readable, measurable and policy-relevant environmental indicators […] to contribute to [...] better integrating environmental concerns in sectoral policies such as agriculture, forestry, industry, aid, energy, transport, trade and urban policies […]*".
- A 1998 Recommendation of the OECD Council on Environmental Information asked OECD countries to further develop and use indicators to measure environmental performance, and in particular: "... *establish indicators of progress concerning the implementation of national and sub-national policies on the environment, eco-efficiency and sustainable development [...]*".

PURPOSE

The OECD environmental indicators programme recognises that there is no universal set of indicators; rather, several sets exist, corresponding to specific purposes. Indicators can be used at international and national levels in state of the environment reporting, measurement of environmental performance and reporting on progress towards sustainable development. They can also be used at national level in planning, clarifying policy objectives and setting priorities.

The OECD work[1] includes several types of environmental indicators (Table 1):

- the OECD Core Set of environmental indicators, to keep track of environmental progress;
- several sets of sectoral indicators, to promote integration of environmental concerns into sectoral policy-making;
- indicators derived from environmental accounting, to promote both integration of environmental concerns into economic policies, and sustainable use and management of natural resources.

All these indicator sets are closely related to each other. The OECD Core Set represents a minimum set common to OECD countries and common to different uses and purposes. The most important sectoral indicators are thus part of the Core Set, as are major indicators derived from resource accounting.

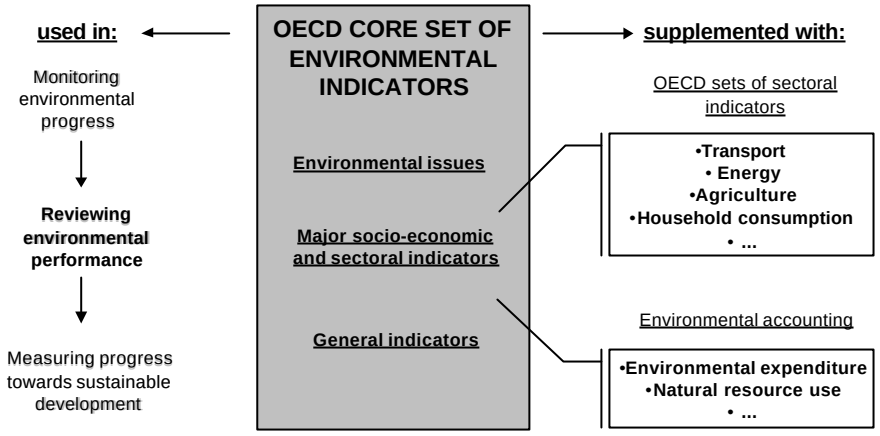
RESULTS

In developing harmonised international environmental indicators, OECD countries adopted a pragmatic approach, which led in particular to:

- agreement to use a common conceptual framework, based on a common understanding of concepts and definitions and on the pressure-state-response (PSR) model;
- identification of criteria to help in selecting indicators and validating their choice: all indicators are reviewed according to their policy relevance, analytical soundness and measurability;
- identification and definition of indicators (including an assessment of their measurability);
- provision of guidance for the use of indicators.

[1] *Work steered by the OECD Working Group on the State of the Environment (WGSOE).*

Figure 1. **OECD environmental indicators - Several sets**



The results of this work, and in particular its conceptual framework, have in turn influenced similar activities by countries and international organisations (e.g. the UNCSD work on sustainable development indicators).

USES

The OECD's environmental indicators are regularly used in environmental performance reviews and in other analytical work; they are a way to monitor the integration of economic and environmental decision-making, to analyse environmental policies and to gauge environmental results. Beyond these applications, they also contribute to the broader OECD programme on sustainable development indicators.

Table 1. **OECD environmental indicators - Purpose and use**

	OECD Core Set of Environmental Indicators	Sets of sectoral indicators	Indicators derived from environmental accounting
Purpose	⇨ keep track of environmental progress (monitor state & changes and factors involved in it)	⇨ promote integration, i.e. ensure that environmental concerns are taken into account when policies are formulated and implemented	
	⇨ tool for reviewing environmental performance ⇨ tool for monitoring progress towards sustainable development		
Audience	⇨ national governments ⇨ environmental decision-makers ⇨ the public ⇨ international community	⇨ national governments ⇨ sectoral decision-makers	⇨ national governments ⇨ environmental and sectoral decision-makers
Characteristics & coverage	⇨ limited number of core indicators ⇨ common to OECD countries ⇨ common to different uses and indicator sets	⇨ large number of indicators (toolkit) ⇨ one set of indicators per sector ⇨ supplement to the OECD Core Set of environmental indicators ⇨ sectors covered: transport, energy, forestry, agriculture, household consumption	⇨ selected indicators derived from: – OECD pilot accounts (forest resources; water resources) – PAC expenditure accounts
Scope	⇨ national level indicators for use in international work ⇨ sub-national and/or further sectoral breakdown possible		
Framework	⇨ PSR model (environmental pressures, environmental conditions; society's responses) ⇨ Core issues reflecting: – Environmental concerns in OECD countries – Selected socio-economic and sectoral issues	⇨ policy analysis framework: adjusted PSR model (sectoral trends of environmental significance; interactions with the environment; economic and policy aspects)	⇨ accounting frameworks
Major publications	⇨ Preliminary set (1991) ⇨ Core set - synthesis report (1993) ⇨ Core Set (1994) ⇨ Core Set (1998)	⇨ Transport (1993, 1999) ⇨ Energy (1993, 1999) ⇨ Agriculture: stock-taking report by JWP (1997, 1999 forthcoming) ⇨ Household consumption (1999)	⇨ PAC expenditure (1991,93,96,99) ⇨ Natural resource accounts (1993) ⇨ Environmental accounting (1995)
	⇨ Environmental performance reviews, since 1993		

OECD WORK ON SUSTAINABLE DEVELOPMENT INDICATORS

The objective of the OECD's three years initiative on sustainable development is to help Member countries address fundamental sustainable development issues through i) making the concept of sustainable development operational for public policies and ii) moving beyond a sectoral approach to a more integrated approach. The programme draws on ongoing OECD activities and supports related OECD work on country reviews and policy analysis[2]. It was reviewed at the 1998 and 1999 OECD Ministerial Councils, which asked for a report in 2001. To guide the programme, an OECD Round Table on Sustainable Development has been established. It gathers, in a personal capacity, Ministers of Environment and Finance (from Asia-Pacific, North America and Europe), and high-level officials from other international organisations (e.g. World Bank, World Trade Organisation, UNEP, UNCTAD, UNDP), from business and NGOs.

Sustainable development indicators can be seen as a set of indicators each of which is relevant to monitoring a particular policy concern. A more ambitious task is to develop frameworks within which the relationships of different policy goals, the links between indicators and goals and the interaction between different indicators are apparent. Work within the OECD concerns both levels with the requirement that it should lead to indicators whose quality is defensible on both conceptual and practical grounds and whose information content, and thus potential use on policy grounds, justifies the development. It builds on OECD's long-standing experience with economic, environmental and social indicators.

OECD WORK ON SUSTAINABLE CONSUMPTION PATTERNS

PURPOSES

Work on sustainable consumption and production patterns in the OECD has been ongoing since 1994. In its initial phase the OECD work focused on: clarifying the concepts; conducting a series of case studies, i.e. on transport, water, and paper consumption; and reviewing the role of governments as major consumers of goods and services. Current work focuses on household consumption patterns. Its purposes are to:

- support Member countries in their efforts towards more sustainable patterns of consumption;
- support and influence the international work programme being co-ordinated by the UN Commission on Sustainable Development.

The work relates closely to other OECD activities, and in particular, to the projects "Increasing Resource Efficiency" and "Environmental Outlook and Strategy" as well as to the OECD initiative on Sustainable Development.

KEY ELEMENTS

Key elements of the OECD work on sustainable consumption include:

- the development of a conceptual framework for examining consumption patterns and related policy responses;
- case studies on policy instruments for influencing consumer demand;
- case studies on household consumption patterns for food, transport, housing and tourism; and
- an analysis of the links between globalisation and consumption patterns.

INDICATORS

The work on sustainable consumption indicators provides the factual basis of the programme. It is expected that the development of the conceptual policy framework and the sector case studies will in turn provide useful feedback on the indicators' policy relevance and help refine the set of indicators proposed in this report.

[2] *It involves most OECD Directorates and close co-operation with the OECD affiliates, the International Energy Agency (IEA), the Nuclear Energy Agency (NEA), the European Conference of Ministers of Transports (ECMT) and the Development Centre. The analytical report to be presented in 2001 will look into i) the policy framework, including indicators to measure progress, ii) key policy responses to natural resource and climate change issues, and to sectoral and local issues (e.g. energy, transport, agriculture),and iii) globalisation and sustainable development.*

OTHER INTERNATIONAL WORK

The UN General Assembly Special Session on Sustainable Development (New York, June 1997) adopted a Programme for the Further Implementation of Agenda 21, identifying sustainable consumption and production as a cross-sectoral, overriding issue for the work of the UN Commission on Sustainable Development (UNCSD). Ongoing work focuses on the development of indicators to measure changes in production and consumption patterns. A workshop discussing a first set of indicators was organised by the UNCSD in March 1998 in New York. It resulted in the selection of a provisional core set of 17 indicators covering key resources and major consumption clusters, and in a report published for the 7th session of the UNCSD in 1999, which reviews chapter 4 of Agenda 21 "Changing Consumption and Production Patterns". This core set will further be integrated into the Core Set of Indicators of Sustainable Development, which is being co-ordinated by the DSD in the context of the Work Programme on Indicators of Sustainable Development of the Commission on Sustainable Development (Inset 5).

Other international fora involved in related work are the World Business Council for Sustainable Development (WBCSD) (sustainable consumption and production patterns, eco-efficiency) and UNEP Industry and Environment (cleaner production).

ABOUT THIS REPORT

This report is part of the work programmes on i) environmental indicators, and ii) sustainable consumption. It further contributes to the OECD-wide project on sustainable development indicators.

This report has been prepared in close co-operation with the UN Division for Sustainable Development through an early and mutual consultation.

OBJECTIVES

The overall aim of this report is to provide measured indicators of OECD countries' consumption patterns and trends, thereby relating conceptual and policy-oriented work to available economic and environmental data. Emphasis is given to final consumption and to households (demand side); it thus complements existing work focusing on the supply side (production). It also serves as a guide to Member countries with a view to launching similar national initiatives and stimulating the debate about the role of demand-side management in sustainable development strategies.

CONTENT AND STRUCTURE

The report is in three parts:

- Part I is an introduction;
- Part II presents the policy context, general conceptual and framework issues, as well as the proposed set of indicators;
- Part III presents selected measured indicators grouped by key consumption activities or clusters.

It further includes two main Annexes:

- Annex 1: Proposed indicators - Indicator sheets describes the policy relevance and measurability of the proposed indicators.
- Annex 2: Measured indicators - Technical Annex, includes data sources, notes and comments on the indicators presented in Part III and on underlying data sets.

DATA AND INTERPRETATION

The data used to calculate the indicators are from OECD and from other international sources. Environmental data largely come from "OECD Environmental Data — Compendium 1997" and "Towards Sustainable Development — Environmental Indicators". Country replies to the 1998 OECD questionnaire on the state of the environment and related comments have been used for selected updates.

Interpretation of the indicators, i.e. interpretation of consumption trends and patterns, has not been attempted and has been left for subsequent analysis as part of the OECD work programme on sustainable consumption. Nevertheless, most indicators display considerable variations of consumption trends and patterns, and suggest considerable room for policy action.

PART II: CONCEPTS AND FRAMEWORK

POLICY CONTEXT

CONSUMPTION PATTERNS AND SUSTAINABLE DEVELOPMENT

Consumption by households and government is a determinant of sustainable development and its economic, environmental and social dimensions. It has important implications for the level and pattern of production and for related demands for natural resources. Growth of private consumption has both positive and negative environmental effects. On the one hand it entails increased use of private transport, more leisure and tourism, higher consumption of resources including energy and land, increased use of packaged goods and higher waste production. On the other hand it also stimulates the demand for environmentally-friendly goods and for a high-quality environment, e.g. in tourist areas.

Agenda 21, endorsed by the UNCED in 1992, identified unsustainable consumption and production patterns, particularly in industrialised countries, as the major cause behind the continued deterioration of the global environment[3]. OECD countries represent only 19 per cent of the world's population and 26 per cent of its land area, but they account for over 70 per cent of world GDP, 80 per cent of world trade, 54 per cent of CO_2 emissions from energy use, 59 per cent of total final energy consumption, and 87 per cent of passenger cars in use. OECD countries are thus collectively the biggest users of natural resources in the world and their consumption and related production patterns have significant environmental, economic and social consequences.

DRIVERS

Various forces shape consumption and production patterns: these include structural economic and socio-demographic changes, sectoral trends, land-use patterns, infrastructure, capital and trade flows, and technological change. Social factors, including values and learned habits, also play an important role[4].

Demand-side measures to influence consumption patterns have, in the past, received less attention than measures to influence production patterns. Increasingly, however, governments are finding it necessary to examine the driving forces behind current demand for goods and services, and to develop policies that promote more sustainable consumption patterns.

POLICY RESPONSES

Agenda 21 stresses that changes in consumption and production patterns are necessary to ensure more sustainable development. It calls on industrialised countries to take the lead in achieving sustainable consumption patterns and demonstrate that resource-efficient, low-pollution life-styles are feasible[3]. This requires a decoupling of standards of living from resource inputs and can be promoted by further integrating environmental and sustainability concerns into public and private decision making.

Trying to influence consumption patterns is a challenging policy area, and finding solutions requires sound examination of controversial issues, such as limiting the use of private cars, and sound, case-by-case analysis that takes account of specific economic, social, and environmental implications. Evidence from OECD countries[4] shows that a shift to less environmentally damaging consumption patterns is possible without reductions in the "quality of life". It also shows that environmental policies carried out in the 1980s and 1990s did not pose significant economic difficulties and did not have detrimental effects on international trade and on employment[5].

3. *Chapter 4 of Agenda 21 states that (. . .)* "the major cause of the continued degradation of the global environment is the unsustainable pattern of consumption and production, particularly in industrialised countries" *(. . .). It also emphasises that (. . .)* "although consumption patterns are very high in certain parts of the world, the basic consumer needs of a large section of humanity are not being met. This results in excessive demands and unsustainable life-styles among the richer segments, which place immense stress on the environment" *(. . .). The text stresses that (. . .)* "Changing consumption patterns will require multipronged strategy focusing on demand, meeting basic needs for the poor, and reducing wastage and the use of finite resources in the production process".
4. *OECD. 1997. Sustainable Consumption and Production — Clarifying the Concepts, OECD Proceedings, Paris.*
5. *OECD, 1996. Environmental Performance in OECD Countries — Progress in the 1990s, Paris.*

OECD work suggests that policies to change consumption patterns should start with practical measures, without aiming to influence deeply-held values. Visible progress may so far be limited in most OECD countries, but many policy initiatives are either underway or planned.

Countries are applying a broad range of policy tools in specific sectors to prevent or offset the negative environmental effects of changing consumption patterns. These range from demand-side management strategies, including increased consumer awareness, to measures which encourage eco-efficient production patterns and product policies, including expanded use of life cycle analysis and extended producer responsibility. To influence consumption patterns, governments can use regulatory, economic and information/social instruments. Prescriptive instruments are used to take immediate effect, but might also be used to provide incentives for changes in technologies and preferences (induced structural change). Governments can show the way by "greening" their own consumption and operations.

REGULATORY INSTRUMENTS

Regulatory instruments may be used in some cases to direct consumers towards more environmentally-friendly behaviour; in other cases they may be used to encourage eco-efficient production patterns and product policies (e.g. standards on minimum recycled content and energy efficiency; bans and restrictions on materials, products and disposal; standards on road vehicle exhaust emissions).

Other governments' regulatory measures to influence consumer behaviour could include:

- Comprehensive product policies, including producer responsibility targets for re-use, recycling, durability and resource efficiency.
- Voluntary agreements with industry sectors on key issues of sustainable production and consumption, monitored by peer boards.
- "right to know" provisions to cover the life cycle environmental impacts of products.
- Competition policies to stimulate greater choice in environmentally superior goods and services.
- Strategies for developing sustainable building and construction practices.
- Review of existing regulations and standards, which hinder sustainable consumption.
- Measures to encourage the development of markets for second-hand products.

ECONOMIC INSTRUMENTS

Economic instruments (charges, fees, taxes, subsidies, expenditure) promote the internalisation of measurable externalities. Economic incentives through environmentally-sound pricing and taxation policies, for instance, can be used in two ways: to prevent general increases in income from being transformed into environmentally-harmful consumption patterns, and to support people's willingness to adopt new ways of life. Government investments and procurement policies can help to shape market conditions; they can be used to stimulate and support environmentally-friendly technologies and products and to provide appropriate pollution abatement and control equipment.

Economic instruments are generally regarded the most important instruments, but there are often ideological and practical obstacles to their widespread adoption. In some cases, their introduction is determined through preceding consultative process. For example, taxes on consumption are often regressive in nature and, consequently, hardest on the low-income groups. Some additional government measures targeted at the poor may thus be necessary to compensate for the increased price of heating oil, for example. With the right incentives, such as selectively applied eco-taxes, changes in consumption patterns can involve orders of magnitude increases in the productivity of energy and material resources, reduced/eliminated use of toxics and creation of closed-loop systems[4].

Governments can apply a broad range of economic instruments, such as:

- Reforming fiscal and pricing policies to internalise environmental costs so that effective incentives are given for sustainable consumption and production, while introducing mitigating measures to protect poorer sections of society.
- Shifting the tax burden from labour to resource use and to environmental damage in order to prompt greater efficiency, reduce pollution, strengthen the market for cleaner technologies and create jobs.
- Removing subsidies that generate unsustainable patterns of consumption and production.

- Reviewing capital investment programmes through the application of strategic environmental assessment on plans, policies and programmes (e.g. for urban development, transport and energy infrastructure).

INFORMATION/SOCIAL INSTRUMENTS

Information/social instruments aim at increasing consumers' decision-making options through information on the consequences of their consumption choices and behaviour, so as to encourage demand for, and use of, environmentally-sound products. They include information and public awareness instruments, designed to change structural consumer preferences over time (e.g. eco-labelling, product hazard warnings, advertising campaigns, environmental education) and participation/communication instruments, such as public participation in policy development. The latter are applicable in circumstances in which choices for action can be formulated on the basis of preferences revealed through discussion, consultation, participation and other mechanisms of social choice. In these cases, governments are the organisers of institutional processes in which stakeholders define priorities for action. They also include other public activities such as promotion of local innovation and experimentation by the central government.

Through social instruments, government can:

- Develop public education campaigns to raise public awareness on the environmental impacts of lifestyles, the options for improvement and the benefits of more sustainable consumption (e.g. the need to curb traffic growth).
- Endorse and publicise successful social innovations to promote sustainable consumption.
- Provide information and advice on the environmental impacts of household budgets and spending patterns supportive of a more sustainable lifestyle.
- Ensure the transparency, access and credibility of eco-label programmes, prevent discrimination against foreign producers and explore possibilities for mutual recognition.
- Develop eco-label programmes to promote the improvement of product performance.
- Support consumer organisations in developing environmental testing of products.

GOVERNMENTS AS CONSUMERS

Governments are important consumers in their own right and can have significant environmental effects through their day-to-day operations and administrative processes. In 1996, OECD Environment Ministers agreed on a Council Recommendation on Improving the Environmental Performance of Government to spur governments to reduce the environmental impacts of their own operations and to improve their decision-making processes. Advances have been made in OECD countries to:

- "green" government procurement policies: a government's significant market presence makes it a potentially powerful agent of change in the marketplace. Several purchasing initiatives have succeeded in increasing the demand for, and supply of, environmentally preferable products (e.g. use of re-refined oil and recycled paper, purchase of computers with energy-saving "sleep" mode option). The leverage of government purchasing can be instrumental, but it may also be limited in terms of efficiency, effectiveness and return on the investment of both time and resources;
- set quantitative targets to reduce energy and water consumption and waste generation;
- apply environmental management systems in government-owned or -operated facilities;
- improve mechanisms for inter-ministerial consultation and co-ordination; and
- promote action at all levels of government.

SOCIAL ASPECTS

Consumption patterns and related environmental effects are closely interwoven with a number of social factors. Social factors act as drivers on consumption choices and behaviour; among these are structural socio-demographic changes such as ageing and the average size of households, income levels and distribution, patterns of urban sprawl, and time spent on leisure activities. Values and learned habits, also play an important role.

More analysis is needed to assess the actual social significance of observed consumption patterns, related environmental effects and individual welfare.

INTERNATIONAL AND TRADE ASPECTS

Global trade, by definition, implies a geographical separation of consumption and production. This raises new questions concerning their separability in policy terms. Globalisation also accelerates technological change and the exchange of information. As long as appropriate signals are provided, it could also allow more efficient allocation of resources, including unpriced natural resources.

Globalisation also means greater geographical dispersion of the environmental effects of consumption and the need for greater co-operation between OECD and non-OECD countries to make progress.

SUSTAINABLE CONSUMPTION: CONCEPTS AND DEFINITIONS

OVERALL APPROACH

Consumption patterns are influenced by production patterns and vice versa. In a life-cycle perspective which includes re-use and re-cycling, the distinction between consumptive and productive use of outputs or inputs is increasingly blurred. For the purposes of this report, consumption is defined as the final consumption activity of households (including the production of recyclable inputs) and governments, as opposed to production which is undertaken by firms (including input use). The definitions used are those of the national accounts system.

The term consumption on its own can be both ambiguous and misleading. It can be used to refer to consumption expenditures, the acquisition of consumption goods and services, and to the physical use of goods and services for the direct satisfaction of human needs and wants. Distinguishing between consumption expenditure and actual final consumption helps to avoid such ambiguity. Recording consumption on an expenditure basis serves to identify the institutional units that incur the expenditures. Recording consumption on an acquisition basis helps to identify the units (or agents) that actually acquire the goods and services and benefit from their use (SNA, 1993[6]). In a national accounts framework, consumption activity consists of "*the use of goods and services for the satisfaction of individual or collective human needs or wants*" (Inset 1).

DEFINING SUSTAINABLE CONSUMPTION

The OECD approach to sustainable consumption has two main features. The first one is to recognise its value as an integrating concept (for economic, social, developmental and environmental policies). The second emphasises the added value that can be obtained from a new focus on the driving factors behind consumption patterns (demand-side) as a complement to existing work on production (supply-side).

There is no unique way to define sustainable consumption. The 1994 Oslo Ministerial Roundtable[7] hosted by the Norwegian government produced the following working definition: "*the use of services and related products which responds to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emissions of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations*"[8]. This definition is not operational, however, unless we have determined — on a case-by-case basis — whether the consumption of any particular good, service or natural resource is sustainable or not.

It is essential to distinguish sustainable consumption from broader issues of sustainable development. A starting point is to understand the interactions between demand and supply and the forces which drive existing patterns of consumption and production, including consumer demand, competition, innovation (in technology, products and services), and financial flows. These patterns are driven by the purchasing choices of individual business and public sector consumers, which in turn are influenced by various factors. More analysis is needed to assess the actual environmental significance of observed

6. *System of National Accounts, 1993. CEC, IMF, OECD, UN and World Bank. Brussels/Luxembourg, New York, Paris, Washington, DC.*
7. *The goal of the Oslo Ministerial Roundtable was to prepare elements for an international work programme on sustainable production and consumption as mandated by the second session of the UN Commission on Sustainable Development (UNCSD) in May 1994. The report from the Roundtable was submitted to the UNCSD for consideration at its third session in April 1995.*
8. *Norwegian Ministry of Environment. 1994. Report of the Symposium on Sustainable Consumption, Oslo.*

consumption patterns. More work is also needed to achieve better understanding of the links between consumerism, economic growth and individual welfare.

In practice, it is necessary to interpret sustainable consumption in a pragmatic way. Thus, sustainable consumption can be understood to include a range of changes in behaviour, such as greater efficiency in the consumption of energy and resources in the home, the minimisation of waste, and more environmentally sound purchasing habits of households and governments.

ANALYSING SUSTAINABLE CONSUMPTION

Policy-relevant quantitative measures of progress towards sustainable consumption require a good understanding of how the related driving forces and policy instruments interact, as well as appropriate analytical tools and a good knowledge of underlying concepts and definitions. Assessing the sustainability of consumption further requires some understanding of environmental limits within which consumption can take place — although this is usually difficult to define at the level(s) at which consumption patterns have an effect. Thus it may be more meaningful to talk about the path towards "increased sustainability" rather than about absolute end-points.

A number of concepts and approaches are potentially useful in monitoring and analysing consumption patterns and the related sustainability. Among these are structuring elements such as consumption clusters, policy tools and accounting approaches; frameworks such as national accounting and environmental accounting; and concepts such as eco-efficiency or ecological footprints.

CONSUMPTION CLUSTERS

Consumption can be structured in different ways. One way is to use consumption clusters. Studies carried out in OECD countries[9,10] showed that domestic consumption spans over many different areas of activity, but that its environmental impact was largely related to a few domains, namely food, transport and housing (heating, use of electric appliances). Hence, policy-makers do not need to have an exhaustive view of all possible aspects of household consumption, as long as they have an understanding of the key domains of household consumption.

The aim of the clusters is to show what the consumers spend their money on. A focus on consumption clusters provides a structure for analysing the network of infrastructure, actors, and driving forces behind the satisfaction of certain basic needs. The focus is on the potential for generating changes in consumption patterns (lifestyles) in these domains, without compromising the perceived satisfaction or standard of living of the consumer. Thus to influence consumption patterns, it helps to identify policy options which more effectively address the systematic characteristics of particular consumption patterns.

The structure adopted in the system of national accounts follows the classification of individual consumption by purpose (COICOP) (Inset 1). The UNCSD uses the following domains in its work: mobility, consumer goods and services, buildings and housekeeping, food, and recreation. The OECD identifies four sectors of specific relevance: transport/electronic commerce, food, tourism and housing.

POLICY TOOLS

Another way of addressing the issue is to analyse the different categories of policy instruments which governments have at their disposal. Because of the diverse influences that shape consumption patterns, it is likely that a mix of policy measures will be needed. (See also page 18).

ENVIRONMENTAL ACCOUNTING APPROACHES

Environmental accounting provides interesting tools for measuring the various components of consumption and how they interact with production and related resource use. It further provides a potential for linking physical and monetary information.

Environmental accounting can be defined as the systematic description of interactions between the environment and the economy by means of an accounting framework. There is no unique model for

9. *Australian Department of the Environment, Sport and Territories. 1997. More With Less, Initiatives to Promote Sustainable Consumption. Environmental Economics Research Paper No. 3, Canberra, Australia.*
10. *Ministry of Environment. 1996. Consumption and the Environment: Analysis of Trends, The Hague, Netherlands.*

environmental accounting; approaches vary according to purpose. One generally distinguishes: natural resource and environment accounts, satellite accounts and adjusted national accounts.

NATURAL RESOURCE AND ENVIRONMENT ACCOUNTS

Natural resource and environment accounts aim at collecting quantitative and qualitative information both on the state of natural resources and their evolution. Primarily expressed in physical terms, they describe the stocks and flows of resources, the flow of resources between the environment and the economy and the flow of resources within the economy[11,12]. They provide a useful tool for evaluating the stocks of natural capital and for monitoring resource flows and related efficiencies.

For example, in a joint research effort, the World Resource Institute, the Wuppertal Institute (Germany), the Netherlands Ministry of Housing, Spatial Planning and Environment, and the National Institute for Environmental Studies in Japan have developed physical accounts of the material basis of their industrial economies that parallel traditional economic accounting[13]. The proposed measure, the Total Material Requirement (TMR) of an industrial economy, is the sum of all the material that is moved or extracted from the environment in support of the economy. Some of this material enters the economy as a commodity, but much of it is in hidden flows and never seen in economic accounts. This parallel set of physical accounts is meant to measure an economy's material intensity in a way that is more comprehensive than traditional measures incorporating hidden and foreign components.

SATELLITE ACCOUNTS

Satellite accounts complement the economic information drawn from the System of National Accounts (SNA) without modifying the structure of SNA. They expand the analytical capacity of national accounts in selected areas; they typically combine physical information from environmental statistics and natural resource accounts with economic information from national accounts[12].

ADJUSTED NATIONAL ACCOUNTS

Incorporating environmental aspects in the SNA is by far the most ambitious accounting approach. Development of "Green GDP" means modifying the current system to include the value of natural resource depletion and environmental degradation[12]. Current work focuses on "depletion" aspects, whereas "degradation" aspects are increasingly considered to be better covered in natural resource and environment accounts and in environmental indicator sets.

OTHER RELATED CONCEPTS AND APPROACHES

There are several other concepts, which could be used to evaluate the sustainability of consumption and related production patterns. These concepts are intended to indicate ecological limits to consumption. An OECD workshop, held in Rosendal, Norway, in 1995, examined several of these concepts and approaches including carrying capacity, the steady state economy, environmental space (or ecospace), ecological footprints/rucksacks and eco-efficiency[4]. Unlike traditional policy tools, they all draw attention to inputs rather than to what comes out at the end of pipe. They are thus potentially useful for policy development and implementation, and could help to establish threshold or reference values to which indicators could be related. Carrying capacity, for example, is clearly a fundamental concept in assessing issues of resource exploitation (e.g. maximum sustainable yield of fish stocks) or pollution (e.g. local acid deposition). These concepts could also be used to show to what extent the environmental impact of consumption in the north occurs in the south (Annex 3).

The limits-to-growth premise of these concepts (except eco-efficiency) suggests that ecological viability is the yardstick. Many environmental economists start from the presumption that key unsustainable trends relate not so much to the exhaustion of natural resources, many of which may be substitutable, but to the continued accumulation of wastes in the environment (whose impacts cannot be predicted or controlled).

However, most of these concepts are relatively new and require further development before they can be measured. Thus, they are considered as tools for the future and are not used in this report.

11. OECD. 1994. Natural Resource Accounts: Taking Stock in OECD Countries, OECD Environment Monograph No. 84, Paris.
12. OECD. 1995. Environmental Accounting for Decision-making — Summary Report of an OECD Seminar, OECD Environment Monograph No. 113, Paris.
13. World Resources Institute. 1997. Resource Flows: The Material Basis of Industrial Economies. Washington, DC.

Inset 1. **SNA concepts and definitions**

HOUSEHOLDS

In the SNA, the household sector consists of all resident households. Defined as institutional units, households include unincorporated enterprises owned by households, whether market producers or producing for own final use, as integral parts of those households. Only those household unincorporated market enterprises that constitute quasi-corporations are treated as separate institutional units.

FINAL CONSUMPTION EXPENDITURE

In the SNA, only government, households and non-profit institutions serving households (NPISHs [14]) have final consumption. Final consumption consists of goods and services used by individual households or the community to satisfy their individual or collective needs or wants.

Household final consumption expenditure consists of expenditure incurred by resident households on consumption goods or services. Final consumption expenditure excludes expenditure on fixed assets in the form of dwellings or on valuables [15]. The classification of individual consumption by purpose (COICOP) is used to classify household consumption activities, this includes the following categories:

- food, beverages, and tobacco;
- clothing and footwear;
- housing, water, electricity, gas and other fuels;
- furniture, furnishings and household equipment and routine maintenance of the house;
- medical care and health expenses;
- transport and communication;
- recreational, entertainment, education and cultural service;
- miscellaneous goods and services, *of which*:
  - personal care;
  - expenditure in restaurants, cafes and hotels.

A supplementary classification into the following sub-groups provides for further analytical use:

- durable goods (goods with expected lifetime of considerably more than one year and a relatively high value, such as motor cars, refrigerators and washing machines);
- semi-durable goods (goods with expected lifetime of use of one year or somewhat more or are not of relatively great value, e.g. clothing, linens, base-metal cutlery, garden tools, baskets, custom jewellery, electric toasters, hotplates);
- non-durable goods (goods with expected lifetime of less than one year); and
- services.

The table below helps to understand the final consumption expenditure by government, households and non-profit institutions serving households.

EXPENDITURE AGGREGATES FOR FINAL CONSUMPTION EXPENDITURE AND ACTUAL FINAL CONSUMPTION

Final consumption expenditure	Actual final consumption
(a) Household final consumption expenditure consists of the expenditure, including imputed expenditure, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant.	Actual final consumption of households is measured by the value of all the individual consumption goods and services acquired by resident households. The following three sets of goods and services are included: ♦ those acquired through expenditure by households themselves; their value is given by item (a), left column; ♦ those acquired as social transfers in kind from NPISHs; their value is given by item (b), left column; ♦ those acquired as social transfers in kind from general government; their value is given by item (c) in the left column.
(b) Final consumption expenditure of NPISHs consists of the expenditure, including imputed expenditure, incurred by resident NPISHs on individual consumption goods and services.	NPISHs have **NO** actual final consumption.
(c) Government final consumption expenditure consists of expenditure, including imputed expenditure, incurred by general government on both individual consumption goods and services and collective consumption services. This may be divided into: ♦ government expenditure on individual consumption goods and services; and ♦ government expenditure on collective consumption services.	Actual final consumption of general government is measured by the value of the collective consumption services provided to the community, or large sections of the community, by the government. Its value is given by item (c) in the left column.

14. NPISHs are legal entities which are principally engaged in the production of non-market services for households and whose main resources are voluntary contributions by households (SNA, 1993).

15. Valuables are expensive durable goods that do not deteriorate over time, are not used up in consumption or production, and are acquired primarily as stores of value. They consist mainly of works of art, precious stones and metals and jewellery fashioned out of such stones and metals (SNA, 1993).

INDICATOR DEVELOPMENT: FRAMEWORK AND PROPOSED SET

PURPOSE AND USE

The purpose of the OECD set of household consumption indicators is to:

- highlight the interface between consumption patterns and environmental issues, and in particular help to better understand how different driving forces and policy instruments interact and affect the environmental sustainability of consumption; and to
- contribute to the further integration of environmental and sustainability concerns into decision making and to provide a basis for monitoring related policies.

The indicators are used within the OECD to:

- provide the factual basis for the OECD work programmes on sustainable consumption and on environmental performance reviews; and to
- support the OECD work on sustainable development indicators.

They are further used as an input into the UNCSD work on "Changing Consumption and Production Patterns" with a view to ensuring appropriate harmonisation at international level.

SCOPE AND CHARACTERISTICS

Like OECD sets of sectoral indicators, household consumption indicators are developed in relatively large numbers to provide a "tool kit" for decision-makers and to supplement the OECD Core Set of environmental indicators.

Emphasis is given to final consumption and to households as opposed to intermediate consumption and production which is undertaken by firms.

All indicators refer to the national level and are designed to be used in an international context. Within a country a greater level of detail or breakdown may be needed. The actual measurement of indicators at these levels is encouraged and lies within the responsibility of individual countries.

FRAMEWORK STRUCTURE

The framework adopted to structure household consumption indicators resembles that of other OECD work on sectoral indicators[16] (Inset 2). It is based on an adjusted PSR model and distinguishes three themes:

- environmentally significant consumption trends and patterns
- interactions between consumption patterns and the environment
- economic and policy aspects.

ENVIRONMENTALLY SIGNIFICANT CONSUMPTION TRENDS AND PATTERNS

Environmentally significant consumption trends and patterns cover major driving forces and indirect pressures. The proposed indicators relate to:

- selected general trends and patterns, which act as drivers for most other indicators, including:
  - economic trends including expenditure shares of GDP, saving rates, household and government consumption;
  - socio-demographic trends such as urbanisation (urban/rural population), household size, population characteristics (e.g. dependency ratio, ageing index);

  These general trends could further be complemented with information on income distribution and employment/unemployment levels.

16. *Sets of sectoral indicators have been developed by OECD for the integration of environmental concerns into energy, transport, agricultural and forestry policies.*

Inset 2. **Framework of OECD sets of sectoral indicators**

PURPOSE AND CHARACTERISTICS

The OECD has been developing sets of sectoral indicators to better integrate environmental concerns into sectoral policies since 1989. The objective is to develop a "tool kit" for sectoral decision-makers and to supplement the OECD Core Set of environmental indicators, which includes main core indicators. While limited to a specific sector and its interactions with the environment, these indicators are developed in relatively large numbers.

Sectoral indicator sets are not restricted to "environmental indicators" per se, but also concern linkages between the environment and the economy, placed in a context of sustainable development. They may include environmental indicators (e.g. pollutant emissions), economic indicators (e.g. sectoral output, prices and taxes, subsidies) and selected social indicators.

FRAMEWORK

The conceptual framework adopted for sectoral indicators (see below) is derived from the pressure-state-response model, but was adjusted to account for the specificities of the respective sectors. As defined by OECD countries, sectoral indicators are organised along a framework that distinguishes:

- Sectoral trends and patterns of environmental significance (i.e. indirect pressures and/or related driving forces);
- Interactions between the sector and the environment, including positive and negative effects of sectoral activity on the environment (i.e. direct pressures, such as pollutant releases and resource use, and related effects and resulting environmental conditions, such as ambient concentrations of pollutants and population exposure), as well as effects of environmental changes on sectoral activity;
- Economic linkages between the sector and the environment, as well as policy considerations. This category includes environmental damage and environmental expenditure, economic, and fiscal instruments, and trade issues.

Sectoral trends and patterns of environmental significance	Interactions with the environment	Economic and policy aspects
Indirect pressures and/or driving forces	Sector related: • Resource use • Pollutant & waste generation • Risk and safety issues • Related effects and resulting environmental conditions • Selected direct responses	Sector related: • Environmental damage • Environmental expenditure • Taxation and subsidies • Price structures • Trade aspects

This framework is applied by the OECD to the transport and energy sectors, and to household consumption. A set of sectoral indicators is also being developed for the agricultural sector[17].

17. 🕮 *OECD (1993, 1999), Indicators for the Integration of Environmental Concerns into Transport Policies*
🕮 *OECD (1993, forthcoming), Indicators for the Integration of Environmental Concerns into Energy Policies*
🕮 *OECD (1997), Environmental Indicators for Agriculture*

- key household consumption trends covering the following activities: transport and communication; consumption of durable and non-durable goods, including food; recreation and tourism; and housing-related energy and water use.

INTERACTIONS BETWEEN CONSUMPTION PATTERNS AND THE ENVIRONMENT

Interactions between consumption patterns and the environment cover direct pressures on the environment and on natural resources and related impacts. The proposed indicators relate to:

- consumption-induced resource abstractions such as water abstractions for public supply;
- consumption-induced pollutant and waste discharges, and related treatment or recycling rates;
- related effects on environmental conditions such as human exposure to air pollution in heavy traffic areas, exposure to noise from various sources.

The indicators are structured by media or environmental issue; focus is given to air, water, waste and land. Other important issues such as biodiversity, are only partially covered at this stage and may need to be further developed. Also, indicators on the environmental implication of urbanisation and tourism need to be given more consideration.

Indicators on interactions with the environment can further be grouped by major consumption activity as described under the previous theme.

ECONOMIC AND POLICY ASPECTS

Economic and policy aspects cover key policy and other societal responses, as well as trade aspects. The proposed indicators relate to:

- economic instruments including consumer price indices, public sector and household expenditure on PAC, prices and taxes for energy and water, tax rates on resource use, subsidies for transport, devices and technologies that promote a more efficient use of resources;
- information/social instruments including consumer attitudes, eco-labelling, public expenditure on environmental information and education;
- trade aspects such as the composition of internationally traded goods (raw materials, manufactured goods, services) or the ratio between imported and domestically produced goods.

Indicators on regulatory instruments are not proposed here.

Indicators on economic and policy aspects can further be grouped by major consumption activities as described under the first theme.

PROPOSED SET OF INDICATORS

A summary of the proposed set of household consumption indicators, grouped by major consumption activity, is provided in Table 2.

The lists identifies both indicators which are immediately measurable (short term indicators) and indicators which would be desirable from a policy point of view, but which currently cannot be constructed due to either methodological or data problems (medium and long term indicators). Future work could aim to overcome these problems, for example by clarifying definitions and by encouraging data collection in these areas.

Given the horizontal nature of consumption (it cuts across the economy and combines many closely interwoven economic and social functions), overlaps among selected issues remain.

SELECTION CRITERIA AND EVALUATION

Indicators are reviewed according to the criteria identified by the WGSOE, i.e. policy relevance, analytical soundness and measurability (Inset 4). A first evaluation according to these three criteria is given in Table 3. The following classifications are used:

Selection criteria	Evaluation		
	1	2	3
♦ policy relevance, i.e. relevance to consumption and environment policies	High	Medium	Low
♦ analytical soundness	Good	Average	Poor
♦ measurability, taking into account:			
– data availability	Short term	Medium term	Long term
– data quality including international comparability	Good	Average	Poor

SHORT TERM INDICATORS

Based on OECD experience with environmental data and indicators, a small set of indicators has been identified as short term tools for current OECD work on sustainable consumption patterns. Short term indicators for which data are currently available for a majority of OECD countries have been calculated and are presented in Part III of this report.

In order to ensure consistency with the OECD work programme on sustainable consumption patterns, and with related UNCSD work, the measured indicators are grouped by major consumption activity as shown in Table 2. They relate to 10 out of the 25 UNCSD indicators for consumption clusters, and to 4 out of 9 UNCSD core indicators.

LINK WITH OTHER OECD INDICATOR SETS

The proposed set of household consumption indicators relates closely to other indicator sets developed and used by the OECD:

- it supplements the OECD Core Set of environmental indicators, which includes major core indicators common to different countries and to different uses,
- it is closely linked to the OECD sets of indicators for the integration of environmental concerns into energy policies and for the integration of environmental concerns into transport policies,
- it complements existing and planned OECD work focusing on the supply side such as indicators on the intensity of natural resource use or indicators to support the project on "Increasing resource use efficiency".

Inset 3. **Criteria for selecting environmental indicators**

Policy relevance

An environmental indicator should:

- provide a representative picture of environmental conditions, pressures on the environment or society's responses;
- be simple, easy to interpret and able to show trends over time;
- be responsive to changes in the environment and related human activities;
- provide a basis for international comparisons;
- be either national in scope or applicable to regional environmental issues of national significance;
- have a threshold or reference value against which to compare it, so that users can assess the significance of the values associated with it.

Analytical soundness

An environmental indicator should:

- be theoretically well founded in technical and scientific terms;
- be based on international standards and international consensus about its validity;
- lend itself to being linked to economic models, forecasting and information systems.

Measurability

The data required to support the indicator should be:

- readily available or made available at a reasonable cost/benefit ratio;
- adequately documented and of known quality;
- updated at regular intervals in accordance with reliable procedures.

**These criteria describe the "ideal" indicator; not all of them will be met in practice.*

LINK WITH UNCSD INDICATORS

The proposed set of indicators has been prepared in close co-operation with the UN Division for Sustainable Development through an early and mutual consultation. As a result, 19 out of 25 of the UNCSD indicators for consumption clusters are also proposed here and eight out of nine of the UNCSD core indicators (Inset 4). Indicators which are part of both sets or which present high similarities are identified in Tables 2 and 3.

Remaining differences between the two sets are due to:

- the purpose and role of the OECD work on environmental indicators and its focus on OECD countries;
- the OECD focus on final consumption and on households as opposed to intermediate consumption or input use. Production related and resource use indicators are being developed as part of a companion project on "Increasing resource efficiency";
- the need for OECD to provide a short term tool for current OECD work on sustainable consumption patterns, and the distinction made between short term and medium to long term indicators.

INTERPRETATION AND LIMITS

When using the proposed indicators in policy analysis and evaluation, one should keep in mind that indicators are only one tool for evaluation.

The proposed indicators are not intended to provide a mechanical measure of the sustainability of final consumption levels and patterns, but rather to highlight the interface between consumption patterns and environmental issues and to describe the path towards increased sustainability. They should help reveal trends and draw attention to phenomena or changes that require further analyses and possible action. They need to be interpreted in context to acquire their full meaning. They often need to be supplemented by other qualitative and scientific information, notably to explain driving forces behind indicator changes, which form the basis for an assessment. This is particularly true in explaining human behaviour and its motivations, which play an important role in final consumption levels and patterns.

When used in combination with resource use indicators, the proposed indicators further help to describe how demand and supply interact.

PROSPECTS AND FUTURE WORK

The OECD experience shows that environmental indicators are cost-effective and powerful tools for tracking and charting environmental progress and performance. However, experience also shows significant lags between the demand for indicators, the related conceptual work and the actual capacity for mobilising and validating underlying data.

Measurability varies greatly among individual indicators. Some indicators are immediately measurable, others need additional conceptual and statistical efforts before they can be published. Consumption-induced pollutant and waste discharges for example and related effects on environmental conditions are difficult to measure. Also, the classifications used for environmental statistics very often differ from those used in the national accounts framework, and make inter-linkages between environmental and economic indicators difficult.

All indicators proposed in this report are viewed in a dynamic context: they are not necessarily final in character, and may change as analytical knowledge and other international work progresses. Following the basic work that laid down the concepts, framework and principles for developing a set of international sustainable consumption indicators in the OECD and UN contexts, progress is now needed in:

- further refining the indicators to support the sectoral case studies of the OECD Work Programme on Sustainable Consumption (electronic commerce and transport, food, tourism and housing);
- further improving the coverage of social and trade dimensions;
- improving the quality and comparability of the indicators and related basic data sets;
- linking the indicators more closely to established policy goals and sustainability issues.

Table 2. **Proposed set of indicators: Summary table by major consumption activity**

ENVIRONMENTALLY SIGNIFICANT TRENDS	INTERACTIONS WITH THE ENVIRONMENT	ECONOMIC AND POLICY ASPECTS
GENERAL TRENDS		
ECONOMIC TRENDS – Consumption expenditure shares of GDP – Saving rates (genuine savings) – Government consumption: public final consumption expenditure ✔ – Household consumption: private final consumption expenditure ✔		**REGULATORY INSTRUMENTS** – To be further developed **ECONOMIC INSTRUMENTS** – Consumer price index – PAC expenditure (public, households)
SOCIO-DEMOGRAPHIC TRENDS – Household size ✔ – Population structure	**LAND RESOURCES** – Urbanisation: land covered by urban development	**INFORMATION/SOCIAL INSTRUMENTS** – Consumer attitudes – Public expenditure on environmental information and education – Public support to green NGOs
KEY HOUSEHOLD CONSUMPTION ACTIVITIES		
TRANSPORT[18] AND COMMUNICATION		
– Passenger transport ✔ – Passenger car stocks and ownership ✔ – Energy consumption by transport; consumption of road fuels ✔ – Communication tools ✔	**AIR** – Air emissions from (passenger) transport ✔ **NOISE** – Population exposed to road traffic noise	**ECONOMIC INSTRUMENTS** – Subsidies for transport – Road fuel prices and taxes ✔ **TRADE ASPECTS** (see below)
CONSUMPTION OF DURABLE AND NON-DURABLE GOODS		
– Household consumption expenditure by type of good – Ownership of selected household commodities ✔ – Average length of product life ✔ – Paper consumption ✔ – Food consumption ✔	**WASTE** – Generation of household waste – Waste recycling rates **NOISE** – Population exposed to neighbourhood noise from various sources	**ECONOMIC INSTRUMENTS** – Tax rates on natural resource use vs. services **TRADE ASPECTS** – Composition of internationally traded goods – Ratio between imported and domestically produced goods in domestic consumption **INFORMATION/SOCIAL INSTRUMENTS** – Eco-labelled products
RECREATION AND TOURISM		
– Trends in international tourism: international tourist receipts ✔ – Household consumption expenditure on recreation – Leisure travel ✔	**LAND RESOURCES** – Land use patterns & conversions in sensitive areas – Land used for recreation ✔ – Access to green areas in cities **BIODIVERSITY** – Protected areas	– to be further developed
HOUSING RELATED ENERGY[19] AND WATER USE		
ENERGY – Total final energy consumption – Residential energy consumption ✔ **WATER** – Household water consumption ✔	**AIR** – Air emissions from residential energy use **WATER** – Water abstractions for public supply – Waste water discharges by households – Population connected to waste water treatment plants	**ECONOMIC INSTRUMENTS** – Household energy prices & taxes ✔ – Subsidies for efficient building technologies & practices – Subsidies for energy saving devices **ECONOMIC INSTRUMENTS** – Prices for public water supply – Charges for waste water treatment – Subsidies for water saving devices

Legend: ▭ : Short-term indicators measured and presented in Part III of this report
✔ : Indicators identical or similar to indicators proposed in the UNCSD set.

[18] *For further details see "Indicators for the integration of environmental concerns into transport policies", OECD, 1993, 1999.*
[19] *For further details see "Indicators for the integration of environmental concerns into energy policies", OECD, 1993, 1999 (forthcoming)*

Table 3. **Evaluation of proposed indicators**

	Policy relevance	Analytical soundness	Measurability	
			Data availability	Data quality
ENVIRONMENTALLY SIGNIFICANT TRENDS AND PATTERNS				
GENERAL TRENDS				
Economic trends				
♦ Expenditure shares of GDP	1	1	1	1
♦ Saving rates (genuine savings)	2	1	1	1
♦ Government consumption: public final consumption expenditure ✔	1	1	1	1
♦ Household consumption: private final consumption expenditure ✔	1	1	1	1
Socio-demographic trends				
♦ Household size ✔	1	1	3	3
♦ Population structure	1	1	1	1
KEY HOUSEHOLD CONSUMPTION ACTIVITIES				
Transport[20] and communication				
♦ Passenger transport				
– trends and intensities by mode ✔	1	1	2/3	2
– road traffic by passenger cars	1	1	1/2	2
– share of public transport	1	1/ 2	2/3	2/3
♦ Passenger car stocks ✔, structure and ownership	1	1	1	2
♦ Energy consumption by transport				
– trends and intensities by mode	1	1	1	1
– consumption of road fuels ✔	1	1	1	1
♦ Communication tools				
– Newspaper circulation	1	1	1	2
– Telephone lines, computers and/or Internet connections ✔	1	1	1	2
Consumption of durable and non-durable goods				
♦ Household consumption expenditure by type of good	1	1	1/2	1
♦ Ownership of selected household commodities ✔	1	2	2	2
♦ Average length of product life ✔	1	3	3	3
♦ Paper consumption ✔	1	1	1	2
♦ Food consumption ✔				
– by type of food	1/2	1/2	1	2
– by growing method and/or level of process	1/2	3	3	3
Recreation and tourism				
♦ Trends in international tourism: international tourist receipts ✔	2	1	1	1
♦ Household consumption expenditure on recreation	1	1	1/2	1
♦ Leisure travel	1	2	3	3
Housing related energy[21] and water use				
♦ Total final energy consumption: intensity and structure by type of use	1	1	1	1
♦ Residential energy consumption: intensity & structure ✔	1	2	2/3	3
♦ Household water consumption: intensity & structure ✔	1	2	2/3	3

[20] *For further details see "Indicators for the integration of environmental concerns into transport policies", OECD, 1993 and 1999*
[21] *For further details see "Indicators for the integration of environmental concerns into energy policies", OECD, 1993 and forthcoming*

	Policy relevance	Analytical soundness	Measurability	
			Data availability	Data quality
INTERACTIONS WITH THE ENVIRONMENT				
Air				
♦ Air emissions from residential energy use	1	2	1/2	2/3
♦ Air emissions from passenger transport	1	2	3	3
♦ Air emissions from road transport ✔	2	2	1/2	2
Waste				
♦ Generation of household waste	1	1	1/2	2
♦ Waste recycling rates (paper, glass, etc.)	1	2	1/2	2
Water				
♦ Water abstractions for public supply	1	2	2	2
♦ Waste water discharges by households	1	2	3	2
♦ Population connected to waste water treatment plants	1	2	1/2	1/2
Noise				
♦ Population exposed to noise from various sources	2	1	2/3	2/3
Land and biodiversity				
♦ Use of land resources and of space				
– Urbanisation: land covered by urban development	2	1	2	2
– Land use patterns and conversions in sensitive areas	2	2	3	3
– Land used for recreation ✔	2	2	3	3
– Access to green areas in cities	2	2	3	3
♦ Protected areas	2/3	1	1	1
ECONOMIC AND POLICY ASPECTS				
Regulatory instruments - no indicators proposed				
Economic instruments				
♦ Consumer price index	1/2	1	1	1
♦ Pollution abatement and control expenditure (public sector, households)	1	2	2	2
♦ Energy prices and taxes				
– Energy prices and taxes for households ✔	1	1	1	1
– Road fuel prices and taxes ✔	1	1	1	1
♦ Prices for public water supply	1	2	1/2	2
♦ Charges for waste water treatment	1	2	3	3
♦ Subsidies for transport, efficient building technologies and practices, and water/energy saving devices	1	3	3	3
♦ Tax rates on natural resource use compared to tax on services	1	2	3	3
Information/social instruments				
♦ Consumer attitudes towards environment	1	2	2	2
♦ Eco-labeled products ✔	2	2	3	3
♦ Public expenditure on environmental information and education	1	2	3	3
♦ Public support to green NGOs	2	2	3	3
Trade aspects				
♦ Composition of internationally traded goods	2	1	2	2
♦ Ratio between imported and domestically produced goods in domestic consumption	2	2	2	2

Legend: [ ] : Short-term indicators measured and presented in Part III of this report
✔ : Indicators identical or similar to indicators proposed in the UNCSD set.

Inset 4. **UNCSD indicators on measuring changes in consumption and production patterns**

The set of UNCSD indicators for sustainable consumption includes 25 indicators of which 9 core indicators. They are listed below. 19 out of the 25 UNCSD indicators for consumption clusters are also proposed in the OECD set, as are eight out of nine of the UNCSD core indicators

List of UNCSD indicators for consumption clusters [a]

CONSUMPTION CLUSTERS		PROPOSED INDICATORS
Mobility	✔	♦ **distance travelled per capita by mode of transport**
	✔	♦ **number of road vehicles**
	✔	♦ atmospheric emissions of pollutants from the transport sector
	✔	♦ per capita consumption of fossil fuel by motor vehicle transport
	✔	♦ fuel price taxation by fuel type
	✔	♦ number of computers per 1000 inhabitants and/or connections to the internet
		♦ freight traffic by mode of transport (tonne-km per capita)
Consumer goods and services	✔	♦ **retail sales of selected goods per capita (total expenditure or in physical terms)**
	✔	♦ **market share of more sustainably produced goods and services**
	✔	♦ average length of product life for major consumer durables
	✔	♦ per capita paper consumption
	✔	♦ private final consumption expenditure
	✔	♦ public final consumption (total)
		♦ advertising indicator (to be determined)
Food	✔	♦ **market share of** more **sustainably produced food**
		♦ daily caloric supply per capita
Recreation	✔	♦ spending on recreation as share of disposable income
		♦ time spent on leisure, paid and unpaid work, and travelling
	✔	♦ contribution of tourism/recreation to the economy (revenues from tourism/recreation as % of GDP)
	✔	♦ land used for recreation purposes as share of total land area
		♦ site stress indicator/index
		♦ share of alternative tourism over total tourism
Buildings and housekeeping	✔	♦ residential energy and water use per household
	✔	♦ average household size
	✔	♦ use of recycled material in construction

a) This list of indicators, proposed by the UNCSD, includes:
in bold : UNCSD Core Set indicators
✔ : indicators which are identical or similar to the proposed OECD indicators
Additional indicators proposed in the OECD set can be found in tables 2 and 3.

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NOTE

This part of the report presents data and figures concerning selected indicators describing consumption trends and patterns, related environmental impacts and policy responses in OECD countries.

In order to ensure consistency with the OECD work programme on sustainable consumption patterns, and with related UNCSD work, the measured indicators are grouped by general trends (economic and socio-demographic) and by major consumption activities:

- economic trends,
- socio-demographic trends,
- transport and communication,
- consumption of durable and non-durable goods, including food,
- recreation and tourism, and
- housing related energy and water use.

The indicators presented here are those for which data are currently available for a majority of OECD countries. They have been identified as short term tools for current OECD work on sustainable consumption patterns, and relate directly to 10 out of the 25 UNCSD indicators for consumption clusters, and 4 out of 9 UNCSD core indicators.

Further work will be necessary to refine the indicators and measure those indicators which are desirable from a policy point of view, but which currently cannot be constructed due to either methodological or data problems.

DATA SOURCES

The indicators presented in this part of the report are those for which data are currently available for a majority of OECD countries. The data used to calculate the indicators are from OECD and from other international sources. Environmental data largely come from "OECD Environmental Data - Compendium 1997" and from “Towards Sustainable Development – Environmental Indicators”. These data are harmonised through the work of the OECD Working Group on the State of the Environment (WGSOE). Some were updated or revised on the basis of comments from SOE Delegates, as received by January 1999.

COMPARABILITY

In many countries, systematic collection of environmental data has a short history; sources are typically spread across a range of agencies and levels of government, and information is often collected for other purposes. When reading this report, one should therefore keep in mind that definitions and measurement methods may vary among countries and that inter-country comparisons require great caution. One should also note that indicators presented in this report refer to the national level and may conceal major sub-national differences. Data sources, notes and comments can be found in Annex 2. “Measured indicators - Technical Annex”.

INTERPRETATION

One should note that indicators are only one tool. They help reveal trends and draw attention to phenomena or changes that require further analyses and possible action. Thus, they need to be supplemented with additional information and interpreted in context to acquire their full meaning.
No attempt has been made to suggest interpretations of the indicators presented in this report. This is a deliberate choice. Interpretation is left for subsequent analysis as part of the OECD work programme on sustainable consumption. Nevertheless, most indicators display considerable variations of consumption trends and patterns, and suggest considerable room for policy action.

GENERAL TRENDS

ECONOMIC TRENDS

Consumption expenditure shares of GDP

Title: PRODCONS.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/24/1999

	Private final consumption expenditure					Government final consumption expenditure					Gross fixed capital formation				
	Share as % of GDP			Change since		Share as % of GDP			Change since		Share as % of GDP			Change since	
	1970	1980	1998	1970	1980	1970	1980	1998	1970	1980	1970	1980	1998	1970	1980
Canada	54	55	56	2	1	25	23	20	-5	-4	15	17	20	5	2
Mexico	69	65	63	-6	-2	7	9	8	1	0	19	22	20	0	-3
United States	64	65	68	4	3	22	18	14	-8	-3	17	17	20	3	3
Japan	55	56	56	1	0	10	11	10	-1	-1	31	28	28	-3	0
Korea	63	56	47	-16	-9	17	14	9	-8	-5	17	27	24	7	-3
Australia	56	58	59	3	1	15	17	17	2	0	26	24	24	-2	0
New Zealand	64	64	62	-2	-2	15	18	15	0	-3	19	17	22	3	5
Austria	53	55	55	1	0	20	20	17	-3	-2	23	23	25	3	2
Belgium	60	63	61	2	-1	16	17	14	-2	-3	21	19	19	-2	0
Czech Republic	..	..	40	..	..	..	..	17	..	..	..	..	..	..	..
Denmark	55	50	49	-6	-1	23	28	25	2	-3	28	21	22	-6	2
Finland	50	48	46	-5	-2	18	21	20	2	-1	29	25	19	-11	-7
France	56	57	58	2	1	18	18	19	1	0	23	22	19	-5	-3
Germany	*54*	*57*	58	*4*	*1*	*19*	*20*	19	*0*	*-1*	*26*	*23*	21	*-5*	*-1*
Greece	68	66	73	5	7	11	13	14	2	0	32	27	24	-8	-2
Hungary	..	..	62	..	..	..	..	11	..	..	..	..	26	..	..
Iceland	57	56	58	1	2	15	15	19	4	3	21	23	22	0	-1
Ireland	73	69	50	-23	-18	19	22	12	-7	-10	22	25	17	-5	-7
Italy	56	60	63	7	2	18	18	17	-2	-1	26	21	18	-9	-4
Luxembourg	67	77	56	-11	-21	15	16	11	-4	-5	26	26	27	1	1
Netherlands	61	64	60	-2	-4	15	15	13	-2	-1	28	21	21	-7	-1
Norway	53	48	43	-10	-5	19	21	19	0	-1	30	29	23	-7	-6
Poland	..	..	57	..	..	..	..	20	..	..	..	..	30	..	..
Portugal	66	63	62	-4	0	9	13	17	7	4	29	27	30	1	3
Spain	61	63	58	-3	-4	10	12	16	5	3	23	19	23	-1	3
Sweden	55	53	49	-6	-4	24	27	24	0	-3	21	19	16	-5	-2
Switzerland	63	59	57	-6	-2	12	13	15	3	2	22	22	25	2	2
Turkey	71	79	65	-6	-14	8	9	12	4	4	18	15	29	11	14
United Kingdom	57	59	64	7	5	23	24	18	-4	-5	19	17	19	0	2
North America	64	64	67	3	3	21	17	14	-7	-3	17	18	20	3	2
* EU 15	57	59	59	2	0	18	19	18	-1	-2	24	21	20	-4	-1
* ** OECD Europe	57	59	59	2	0	18	19	17	-1	-1	24	21	20	-4	0
* ** OECD	60	61	62	2	1	18	17	15	-4	-2	22	21	21	0	1

See Annex 3 for data sources, notes and comments.

ECONOMIC TRENDS

Consumption expenditure shares of GDP - Per capita expenditure

	Gross domestic product			Private final consumption expenditure			Government final consumption expenditure			Gross fixed capital formation		
	10^3US $ /cap.	% change since		10^3US $ /cap.	% change since		10^3US $ /cap.	% change since		10^3US $ /cap.	% change since	
	1998	1970	1980	1998	1970	1980	1998	1970	1980	1998	1970	1980
Canada	20.6	63	24	11.5	70	26	4.0	30	4	4.0	119	40
Mexico	6.1	41	2	3.8	30	-2	0.5	68	-2	1.2	45	-12
United States	27.1	68	37	18.4	78	44	3.9	10	13	5.4	100	59
Japan	19.8	105	50	11.1	110	50	1.9	92	35	5.6	88	51
Korea	11.5	420	196	5.4	289	149	1.0	165	84	2.8	643	160
Australia	19.4	66	37	11.4	74	40	3.2	83	34	4.6	51	37
New Zealand	15.1	34	28	9.3	30	24	2.3	37	9	3.3	57	64
Austria	19.3	94	38	10.6	100	38	3.3	65	20	4.9	118	52
Belgium	19.4	80	33	11.9	86	30	2.7	58	8	3.7	59	31
Czech Republic	10.7	..	..	4.3	..	..	1.8	..	..	..	..	..
Denmark	21.5	74	45	10.4	55	41	5.4	89	28	4.8	39	56
Finland	18.2	93	42	8.4	76	35	3.6	113	32	3.4	23	4
France	19.9	71	31	11.6	77	33	3.7	76	34	3.7	36	12
Germany	18.5	*65*	*28*	10.6	*77*	*29*	3.6	*62*	*17*	3.9	*28*	*15*
Greece	10.7	79	24	7.9	93	37	1.4	112	27	2.6	35	13
Hungary	8.4	..	..	5.2	..	..	0.9	..	..	2.2	..	..
Iceland	20.4	121	33	11.8	125	38	3.8	182	60	4.5	125	26
Ireland	18.9	205	121	9.6	111	62	2.2	88	17	3.3	137	55
Italy	18.4	81	34	11.5	103	39	3.0	64	26	3.2	22	11
Luxembourg	30.7	135	95	17.1	96	41	3.5	75	39	8.2	140	99
Netherlands	19.1	69	38	11.4	65	28	2.5	51	24	3.9	25	33
Norway	21.7	120	46	9.4	78	30	4.2	121	38	4.9	67	14
Poland	6.4	..	..	3.7	..	..	1.3	..	..	2.0	..	..
Portugal	12.3	124	60	7.7	112	59	2.0	302	104	3.7	129	79
Spain	14.4	90	48	8.4	81	38	2.3	189	87	3.3	84	74
Sweden	18.0	45	24	8.8	29	14	4.4	47	11	2.9	11	8
Switzerland	21.5	33	12	12.3	21	9	3.3	63	32	5.3	46	23
Turkey	6.0	92	61	3.9	75	33	0.7	177	127	1.7	210	213
United Kingdom	18.6	76	47	11.9	96	59	3.4	43	14	3.6	75	69
North America	21.4	56	29	14.3	63	35	3.1	5	7	4.3	86	46
* EU 15	18.4	77	38	10.9	84	38	3.2	68	26	3.6	44	30
* ** OECD Europe	16.7	70	34	9.9	75	34	2.9	63	24	3.4	44	31
* ** OECD	18.7	72	37	11.6	77	39	2.7	37	19	4.0	70	43

Net saving per capita

	Total net saving			*of which*: general government			*of which*: corporate and quasi-corporate enterprises			*of which*: households and private unincorporated enterprises		
	1970	1980	1996	1970	1980	1996	1970	1980	1996	1970	1980	1996
Canada	1255	1784	970	347	-285	-260	411	538	510	496	1530	720
Mexico	595	1100	704	..	..	..	..	..	..	..	..	..
United States	1485	1552	1511	-67	-224	-357	350	305	755	1203	1471	1113
Japan	2589	2425	3188	634	342	668	892	377	552	1063	1706	1968
Republic of Korea	240	546	2704	..	172	1210	..	135	231	..	239	1274
Australia	1496	979	820	348	-71	125	338	67	113	810	983	582
New Zealand	1303	1387	948	..	..	..	..	..	..	..	..	..
Austria	1885	2046	1573	..	503	125	..	544	608	..	999	841
Belgium	1844	1211	2248	251	-588	-342	289	109	771	1304	1690	1819
Czech Republic	..	..	512	..	..	263	..	..	-82	..	..	331
Denmark	2948	92	1310	..	..	..	..	..	..	..	..	..
Finland	1520	1447	685	710	820	-315	642	122	885	167	505	115
France	2216	1744	1127	504	335	-638	432	22	606	1280	1387	1160
Germany	..	..	1246	..	..	-224	..	..	145	..	..	1325
Greece	1538	2392	845	..	..	..	..	..	..	..	..	..
Iceland	1046	1812	641	..	1108	484	..	..	..	..	..	..
Ireland	658	375	1988	..	..	-87	..	..	1809	..	..	..
Italy	1784	1800	1435	..	-638	-684	..	282	423	..	2156	1724
Luxembourg	2484	3572	6960	..	..	..	..	..	..	..	..	..
Netherlands	1974	1425	2538	..	79	-141	..	181	1184	..	1165	1496
Norway	1842	2234	3260	..	1256	1821	..	779	760	..	200	679
Portugal	1445	1737	1602	..	..	-263	..	..	1563	..	..	886
Spain	1226	911	1281	..	..	-288	..	..	854	..	..	714
Sweden	1665	820	648	..	-160	-251	..	422	448	..	559	451
Switzerland	3030	2627	2375	..	..	-38	..	..	2060	..	..	353
Turkey	421	245	874	..	..	..	..	..	..	..	..	..
United Kingdom	1291	705	708	780	-194	-559	116	130	295	397	770	972

Data are based on values expressed in US $ at 1991 prices and PPPs. See Annex 3 for data sources, notes and comments.

ECONOMIC TRENDS

Government consumption expenditure

Title: GOVCONS.EPS
Creator: Freelance Plus 3.0
CreationDate: 3/24/1999

	Volume index 1980=100		Per capita expenditure in US$1000 per capita at 1991 prices and PPPs			Per capita expenditure OECD=100 indices		
	1970	1998	1970	1980	1998	1970	1980	1998
Canada	69	129	3.1	3.9	4.0	155	169	147
Mexico	43	141	0.3	0.5	0.5	15	22	18
United States	92	134	3.5	3.5	3.9	177	150	142
Japan	63	147	1.0	1.4	1.9	49	61	69
Korea	59	224	0.4	0.5	1.0	19	23	36
Australia	64	170	1.8	2.4	3.2	88	104	117
New Zealand	72	130	1.7	2.1	2.3	85	92	85
Austria	72	130	2.0	2.8	3.3	100	119	121
Belgium	67	112	1.7	2.4	2.7	84	106	97
Czech Republic	..	..	..	..	1.8	..	..	67
Denmark	65	132	2.8	4.2	5.4	142	181	195
Finland	60	143	1.7	2.7	3.6	84	118	131
France	72	147	2.1	2.8	3.7	106	120	136
Germany	*71*	*126*	*2.3*	*3.2*	3.6	*115*	*138*	131
Greece	55	139	0.7	1.1	1.4	34	49	53
Hungary	..	..	..	..	0.9	..	..	32
Iceland	51	190	1.3	2.4	3.8	67	102	138
Ireland	54	127	1.2	1.9	2.2	59	82	82
Italy	74	129	1.9	2.4	3.0	93	104	111
Luxembourg	74	163	2.0	2.5	3.5	99	108	127
Netherlands	76	137	1.7	2.0	2.5	84	88	92
Norway	59	160	1.9	3.1	4.2	95	133	154
Poland	..	..	..	..	1.3	..	..	47
Portugal	45	206	0.5	1.0	2.0	25	43	74
Spain	59	199	0.8	1.2	2.3	39	52	82
Sweden	73	118	3.0	4.0	4.4	149	171	160
Switzerland	79	149	2.0	2.5	3.3	101	108	120
Turkey	66	331	0.3	0.3	0.7	13	14	26
United Kingdom	79	120	2.4	3.0	3.4	120	130	125
North America	88	133	2.9	2.9	3.1	145	123	112
* EU 15	72	134	1.9	2.6	3.2	96	111	117
* ** OECD Europe	72	138	1.8	2.3	2.9	88	100	104
* ** OECD	78	138	2.0	2.3	2.7	100	100	100

a) Data are expressed in US $ at 1991 prices and PPPs.

ECONOMIC TRENDS

Household consumption expenditure

1998 or most recent year

Title: STRPFC96.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/24/1999

1980

Title: STRPFC80.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/24/1999

ECONOMIC TRENDS

Household consumption expenditure (continued)

% of households' consumption

	Food, beverages and tobacco				Clothing and footwear				Gross rent, fuel and power				Furniture, furnishings and household operation				Medical care and health expenses			
	1970	1980	1996		1970	1980	1996		1970	1980	1996		1970	1980	1996		1970	1980	1996	
Canada	22.1	18.9	14.4		8.3	7.1	5.1		20.5	21.2	25.3		9.7	10.4	8.4		3.5	3.5	4.3	
Mexico	..	..	29.0		..	..	4.3		..	..	14.1		..	..	8.5		..	..	4.4	
United States	18.6	15.7	10.6		8.3	6.7	5.7		18.1	19.2	18.6		7.3	6.4	5.4		9.5	12.0	18.0	
Japan	30.4	24.6	16.3		7.7	7.3	5.2		16.2	18.1	23.3		7.7	5.9	5.0		7.9	9.9	10.8	
Korea	54.9	48.1	27.1		10.2	8.6	3.8		9.3	10.3	12.4		3.9	4.7	6.7		2.5	3.9	6.7	
Australia	27.4	24.2	20.6		8.8	7.0	4.6		15.3	18.7	20.2		7.7	7.8	6.2		6.0	6.2	7.2	
New Zealand	..	..	16.2		..	..	4.1		..	..	20.3		..	..	10.6		..	..	7.3	
Austria	..	23.2	16.8		..	10.8	7.4		..	14.4	20.1		..	8.1	8.1		..	3.5	5.4	
Belgium	28.1	21.0	15.7		8.8	8.0	6.6		15.4	18.5	20.5		11.7	11.5	9.4		6.8	9.5	12.4	
Czech Republic	..	..	33.0	*1994*	..	..	7.8	*1994*	..	..	18.6	*1994*	..	..	4.7	*1994*	..	..	1.0	*1994*
Denmark	29.9	25.2	20.0	*1995*	7.7	5.9	5.2	*1995*	18.1	27.0	27.1	*1995*	9.6	7.4	5.9	*1995*	2.0	1.8	2.1	*1995*
Finland	31.9	27.8	19.4		8.3	6.1	4.6		17.8	18.5	25.0		6.8	7.4	6.0		2.8	3.5	5.5	
France	25.9	21.3	17.6		9.5	7.3	5.1		15.3	17.4	22.0		10.2	9.5	7.3		7.1	7.7	10.2	
Germany	..	..	19.3		..	..	7.0		..	..	24.2		..	..	8.9		..	..	3.8	
w. Germany	30.0	24.9	19.8	*1994*	10.3	9.4	7.6	*1994*	16.3	19.5	22.9	*1994*	10.1	10.1	9.3	*1994*	2.7	2.8	3.8	*1994*
Greece	41.4	40.7	36.6	*1995*	12.4	9.6	6.4	*1995*	14.0	11.8	14.0	*1995*	7.4	8.2	7.4	*1995*	4.1	3.6	4.9	*1995*
Iceland	..	25.1	23.4		..	9.3	7.4		..	20.6	17.4		..	12.8	8.2		..	1.3	2.3	
Ireland	..	..	30.7		..	..	6.4		..	..	15.2		..	..	6.0		..	..	4.0	
Italy	38.7	28.3	18.9		8.5	11.2	8.7		12.4	12.6	18.0		6.8	9.4	8.9		3.8	4.6	6.6	
Luxembourg	28.4	23.0	18.6	*1991*	9.4	7.3	5.9	*1991*	17.5	18.9	19.8	*1991*	9.4	9.3	10.8	*1991*	5.4	7.3	7.3	*1991*
Netherlands	..	17.7	14.1		..	8.0	5.9		..	15.5	20.9		..	7.9	6.6		..	12.7	12.6	
Norway	..	25.4	20.7		..	8.1	6.1		..	21.5	22.7		..	7.7	6.4		..	1.9	2.6	
Portugal	..	..	27.0	*1995*	..	..	8.5	*1995*	..	..	10.7	*1995*	..	..	7.5	*1995*	..	..	5.2	*1995*
Spain	..	28.1	19.3		..	8.1	7.4		..	16.5	13.3		..	7.8	6.2		..	3.6	5.2	
Sweden	..	24.6	18.4		..	7.8	5.3		..	25.1	33.4		..	7.0	5.1		..	2.1	4.0	
Switzerland	..	..	16.9		..	..	4.6		..	..	24.8		..	..	4.8		..	..	13.1	
United Kingdom	33.3	28.1	19.9		8.8	7.2	5.9		17.1	18.5	19.7		7.8	7.2	6.5		0.9	1.0	1.6	

	Transport and communication				Recreation, entertainment education & cultural				Miscellaneous goods and services				*of which: Personal care*				*of which: Restaurants, cafes, hotels*			
	1970	1980	1996		1970	1980	1996		1970	1980	1996		1970	1980	1996		1970	1980	1996	
Canada	14.7	16.0	16.2		7.5	8.5	10.3		13.7	14.4	15.9		2.7	2.6	2.7		7.2	7.9	7.1	
Mexico	..	..	14.6		..	..	6.0		..	..	19.3		..	..	..	..	..	..	7.5	
United States	15.0	16.2	14.4		8.5	8.5	10.8		14.6	15.3	16.5		3.2	2.9	2.8		6.2	6.6	5.7	
Japan	7.8	10.2	11.6		9.2	8.8	12.8		13.1	15.3	15.0		..	..	..	..	..	..	..	..
Korea	6.0	8.6	13.7		5.7	7.3	13.1		7.6	8.3	16.6		..	..	..	..	..	..	..	..
Australia	15.8	15.4	14.3		7.3	8.1	11.0		11.7	12.6	15.9		..	..	..	..	..	..	..	..
New Zealand	..	..	15.4		..	..	9.8		..	..	16.3		..	..	3.0		..	..	8.2	
Austria	..	16.1	16.3		..	6.2	8.1		..	17.8	17.7		..	2.7	2.5		..	13.4	12.0	
Belgium	10.6	12.6	12.7		4.8	6.0	6.3		13.6	13.2	15.9		1.8	1.7	1.7		8.7	7.3	8.9	
Czech Republic	..	..	8.5	*1994*	..	..	17.2	*1994*	..	..	9.3	*1994*	..	..	..	..	..	..	..	..
Denmark	14.9	14.6	18.0	*1995*	8.2	9.2	10.6	*1995*	9.6	8.9	11.1	*1995*	1.6	1.4	1.5	*1995*	5.2	4.7	5.7	*1995*
Finland	15.2	16.3	15.7		6.4	9.4	9.7		10.8	10.9	14.0		1.4	1.8	1.9		5.1	6.4	7.2	
France	13.4	16.5	16.5		6.9	7.3	7.3		11.7	13.1	14.0		1.5	1.5	1.9		6.1	6.4	7.1	
Germany	..	..	17.2		..	..	9.8		..	..	9.8		..	..	1.9		..	..	..	..
w. Germany	14.0	14.8	16.6	*1994*	10.2	10.5	10.1	*1994*	6.3	7.9	9.9	*1994*	1.9	1.8	1.8	*1994*	..	..	..	..
Greece	8.3	12.2	13.5	*1995*	4.8	5.4	5.4	*1995*	7.5	8.5	11.8	*1995*	1.0	1.4	2.0	*1995*	4.5	5.3	7.6	*1995*
Iceland	..	15.2	16.6		..	7.5	11.5		..	8.2	13.3		..	1.4	2.6		..	4.1	8.0	
Ireland	..	..	13.6		..	..	12.7		..	..	11.3		..	..	2.2		..	..	3.4	
Italy	10.3	12.1	12.4		7.7	8.0	8.5		11.8	13.8	18.1		2.7	2.2	3.1		7.1	8.0	10.5	
Luxembourg	10.9	16.6	19.1	*1991*	4.0	3.4	4.2	*1991*	15.0	14.1	14.3	*1991*	..	..	..	..	..	..	..	..
Netherlands	..	12.5	13.3		..	10.0	9.8		..	15.7	16.8		..	..	2.5		..	..	5.3	
Norway	..	16.7	17.2		..	8.6	10.0		..	10.2	14.2		..	..	..	..	..	3.8	5.8	
Portugal	..	..	16.3	*1995*	..	..	8.3	*1995*	..	..	16.5	*1995*	..	..	1.4	*1995*	..	..	9.2	*1995*
Spain	..	13.5	15.8		..	6.8	6.9		..	15.7	25.9		..	..	1.5	*1994*	..	..	18.8	*1994*
Sweden	..	15.3	17.1		..	10.4	9.2		..	7.7	7.5		..	2.7	2.1		..	3.7	4.1	
Switzerland	..	..	11.0		..	..	8.4		..	..	15.0		..	..	..	..	..	..	..	..
United Kingdom	12.6	16.6	17.1		8.6	9.4	10.8		10.8	12.0	18.5		1.8	1.6	2.0		5.4	6.1	8.8	

See Annex 3 for data sources, notes and comments.

ECONOMIC TRENDS

Consumer price index

Title: CONSPRC2.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

Index 1990 = 100, all items

		1970	1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998
Canada		26	56	80	100	106	107	109	109	112	113	115	116
Mexico		0	1	7	100	123	142	156	166	225	302	364	422
USA	♦	30	63	82	100	104	107	111	113	117	120	123	125
Japan		35	82	94	100	103	105	106	107	107	107	109	110
Korea		..	..	..	100	109	116	122	129	135	142	148	159
Australia	♦	17	46	68	100	103	104	106	108	113	116	116	117
N. Zealand		11	36	64	100	103	104	105	107	111	113	115	116
Austria		39	71	90	100	103	108	111	115	117	119	121	122
Belgium	♦	32	64	90	100	103	106	109	111	113	115	117	118
Czech R.		..	..	..	100	157	174	210	232	253	275	298	330
Denmark		22	56	82	100	102	105	106	108	110	113	115	117
Finland		18	53	78	100	104	107	110	111	112	112	114	115
France		22	54	86	100	103	106	108	110	112	114	115	116
Germany	♦	47	77	93	100	104	109	114	117	120	121	123	125
Greece	♦	5	18	45	100	119	138	158	175	191	207	218	228
Hungary		..	36	50	100	135	167	204	243	311	384	455	519
Iceland	♦	0	6	40	100	107	111	115	117	119	122	124	..
Ireland		13	48	85	100	103	106	108	110	113	115	117	120
Italy	♦	11	40	76	100	106	112	117	121	128	133	135	137
Luxembourg	♦	34	65	92	100	103	106	110	113	115	116	118	119
Netherlands		39	79	96	100	103	106	109	112	114	117	119	122
Norway		21	48	74	100	103	106	108	110	112	114	117	119
Portugal	♦	4	21	58	100	110	121	129	136	142	146	149	154
Spain		10	41	73	100	106	112	117	123	129	133	136	138
Sweden		20	48	74	100	110	113	118	121	124	125	126	127
Switzerland		44	72	88	100	106	110	114	115	117	118	118	118
Turkey	♦	0	2	12	100	166	282	469	962	1820	3282	6095	11254
UK		15	53	75	100	106	110	112	114	118	121	125	129
G7		27	62	84	100	104	108	111	113	116	118	121	123
EU 15		19	53	81	100	105	110	114	117	121	124	126	129
** OECD	♦	18	46	71	100	106	111	116	121	128	134	140	145

See Annex 3 for data sources, notes and comments

SOCIO-DEMOGRAPHIC CHANGES

Population structure and density

Title: FIGSOCIO.EPS
Creator: Freelance Plus 3.01
CreationDate: 4/14/1999

	Urban population % of total			Ageing index (Pop.>64)/(Pop.<15) %			Dependency ratio [(Pop.<15)+(Pop.>64)] / [15<=Pop.<=64)] %			Population density inh./km2
	1970	1980	1997	1970	1980	1997	1970	1980	1997	1997
Canada	75.7	75.7	76.8	26.3	41.3	62.2	62.0	47.3	47.2	3.0
Mexico	59.0	66.3	73.8	8.0	8.8	12.9	99.6	88.0	71.2	50.2
United States	73.6	73.7	76.6	34.7	50.1	53.5	61.4	51.1	52.1	28.6
Japan	71.2	76.2	78.4	29.5	38.7	102.0	44.9	48.4	44.9	333.9
Korea	40.7	56.9	83.2	..	..	28.3	..	..	40.3	462.7
Australia	85.2	85.8	84.7	29.0	38.1	57.3	59.2	53.5	49.9	2.4
New Zealand	81.1	83.4	86.3	26.4	35.7	50.9	67.7	58.5	52.3	13.6
Austria	51.7	64.9	64.5	57.8	75.5	89.0	62.4	55.8	48.4	96.8
Belgium ♦	94.3	95.4	97.1	57.1	71.8	91.3	58.7	52.4	51.7	333.6
Czech Republic	..	..	65.8	..	57.7	76.7	..	58.2	45.3	130.6
Denmark	79.7	83.7	85.4	52.7	69.0	84.0	55.2	54.5	49.0	122.4
Finland	50.3	59.8	63.9	37.1	58.8	77.6	51.0	47.7	49.9	15.2
France	71.0	73.3	75.0	51.9	62.2	81.1	60.5	57.0	53.0	106.2
Germany	79.6	82.6	86.9	56.8	85.4	102.1	57.1	50.8	47.2	230.1
Greece ♦	52.5	57.7	59.6	44.9	57.6	95.2	55.5	56.1	47.9	79.6
Hungary	48.5	56.9	65.5	..	..	81.6	..	..	47.0	109.4
Iceland ♦	84.8	88.2	91.6	27.1	35.9	47.0	70.8	59.6	55.3	2.6
Ireland	51.7	55.3	57.9	35.7	35.3	49.2	73.6	70.0	52.6	52.1
Italy	64.3	66.6	66.8	45.9	62.8	101.8	50.3	49.9	44.8	190.8
Luxembourg ♦	67.8	78.8	89.9	57.1	73.5	76.8	53.2	47.5	48.7	162.8
Netherlands ♦	86.1	88.4	89.1	37.3	51.6	72.4	59.9	51.1	46.4	375.9
Norway	65.4	70.5	73.6	52.7	66.6	80.3	59.6	58.6	55.0	14.4
Poland	52.3	58.1	64.4	30.6	41.6	53.7	54.3	52.4	49.4	123.6
Portugal ♦	47.0	66.0	69.0	..	44.9	87.6	..	58.6	47.1	108.0
Spain	66.0	72.8	76.9	33.9	41.9	101.0	60.0	58.1	46.5	78.4
Sweden	81.1	83.1	83.2	65.5	83.1	93.2	52.7	56.0	56.6	19.7
Switzerland	54.5	57.0	61.6	48.7	70.2	84.9	53.3	49.8	48.3	173.4
Turkey	38.4	43.8	71.6	10.6	12.1	16.0	85.9	78.1	56.7	81.7
United Kingdom	88.3	88.6	89.2	54.1	71.2	76.8	59.1	56.1	53.6	240.3
North America	71.1	72.3	75.9	27.1	35.7	40.0	67.2	57.2	55.9	18.6
EU 15	73.9	77.1	79.2	48.9	64.2	89.6	57.4	54.1	49.6	115.4
** OECD Europe ♦	68.9	71.9	76.7	41.9	53.3	70.8	59.3	56.1	50.5	101.7
** OECD ♦	70.2	72.9	76.8	34.5	44.3	59.2	59.9	55.4	51.8	30.1

See Annex 3 for data sources, notes and comments.

KEY HOUSEHOLD CONSUMPTION TRENDS

TRANSPORT AND COMMUNICATION

Road traffic and vehicle intensities

Title: TR-RTRI.EPS
Creator: Freelance Plus 3.01
CreationDate: 4/13/1999

		Road traffic						Motor vehicles in use				GDP
		Total volume		Intensity		Goods vehicles		Total stock		Private car ownership		
		billion veh-km	% change	per unit of GDP veh-km/1 000 US$.	per network length 1 000 veh-km/km	Volume % change	share in total traffic, %	1 000 vehicles	% change	veh./100 inh.	% change	% change
		1996	since 1980	1996	1996	since 1980	1996	1996	since 1980	1996	since 1980	since 1980
Canada		267	30	452	253	72	34	17679	34	46	11	44
Mexico		54	27	99	173	-15	20	12913	109	9	35	30
USA	♦	3570	48	524	556	78	31	206365	32	49	-6	52
Japan	♦	690	77	270	595	85	38	67200	81	37	84	65
Korea		57	554	105	683	651	46	9553	1710	15	2216	265
Australia	♦	172	50	506	188	71	26	10750	48	48	21	63
N.Zealand		27	66	503	297	99	25	2062	32	46	11	47
Austria		56	58	376	434	67	27	4007	64	46	54	41
Belgium	♦	95	107	507	657	35	6	4782	38	42	32	30
Czech R.	♦	30	42	273	538	13	13	3606	87	32	88	..
Denmark	♦	42	58	386	580	64	17	2040	24	33	20	42
Finland	♦	43	60	506	550	51	14	2210	60	38	48	37
France	♦	468	58	422	575	83	22	30755	42	44	23	35
Germany	♦	563	*50*	389	890	*51*	11	43559	*44*	51	*35*	*36*
Greece	♦	52	156	491	1262	134	38	3279	159	22	151	28
Hungary		29	53	375	184	-43	11	2788	137	24	156	..
Iceland	♦	2	98	356	143	60	7	142	48	46	23	43
Ireland		28	53	487	307	37	17	1219	52	29	35	100
Italy	♦	453	100	441	1430	67	12	33516	75	53	70	33
Luxembourg	♦	5	105	380	880	76	7	254	78	57	56	108
Netherlands	♦	108	54	389	778	61	12	6348	40	37	23	42
Norway		28	46	285	305	115	15	2053	47	38	26	60
Poland	♦	119	166	537	316	61	28	9602	213	21	211	..
Portugal		49	129	435	712	57	13	3681	205	28	189	50
Spain	♦	147	108	276	866	95	22	17860	100	38	86	47
Sweden	♦	69	55	451	498	74	6	3981	29	41	19	26
Switzerland	♦	51	40	336	711	42	11	3546	46	46	31	22
Turkey	♦	41	178	120	666	119	32	4328	270	5	213	109
UK	♦	436	81	422	1173	69	16	28486	64	42	54	45
OECD		7750	59	411	551	76	26	538562	55	37	28	..

See Annex 3 for data sources, notes and comments.

TRANSPORT AND COMMUNICATION

Air emissions from road transport
Emission intensities per capita

Title: TRAIR1.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/18/1999

		CO2				NOx				CO			
		t./ million veh.-km	t./cap.	% of total	% change since	t./ million veh.-km	kg/cap.	% of total	% change since	t./ million veh.-km	kg/cap.	% of total	% change since
		1996	1996	1996	1980	1996	1996	1996	1980	1996	1996	1996	1980
Canada		399	3.6	23	5	2.2	19	29	..	17.2	153	45	..
Mexico		1762	1.0	28	121	..	..	..	..	..	..	..	..
USA	♦	363	4.9	24	29	1.9	26	35	-12	14.9	202	68	-26
Japan	♦	314	1.7	18	70	0.8	4	..	-32	..	..	..	..
Korea	♦	1159	1.4	16	2183	9.9	12	45	..	17.8	21	84	..
Australia		348	3.3	20	47	..	..	..	..	..	..	..	..
N. Zealand		234	1.8	20	35	..	..	..	..	..	..	..	..
Austria	♦	298	2.1	27	37	..	..	..	..	..	..	..	..
Belgium	♦	233	2.2	18	48	1.9	17	53	..	9.7	83	59	..
Czech Rep.		323	0.9	8	54	5.8	17	40	..	8.0	23	27	..
Denmark	♦	261	2.1	15	56	1.9	15	28	14	8.6	67	59	-46
Finland		241	2.0	16	36	3.0	25	47	-7	6.8	56	63	-25
France	♦	254	2.0	31	44	2.2	17	59	16	12.1	95	59	33
Germany	♦	290	2.0	18	38	1.6	11	49	..	6.2	43	52	..
Greece		276	1.4	19	109	2.5	12	35	..	..	..	..	..
Hungary		208	0.6	10	13	3.0	9	46	..	14.9	43	60	..
Iceland	♦	344	2.3	24	69	3.8	25	23	21	26.6	176	95	14
Ireland	♦	217	1.7	17	41	..	..	..	..	..	..	..	..
Italy		230	1.8	25	59	..	..	..	..	..	..	..	..
Luxembourg		762	8.3	38	177	..	..	..	..	..	..	..	..
Netherlands	♦	265	1.8	15	42	2.0	14	43	-21	4.5	31	56	-57
Norway		335	2.1	30	67	2.3	15	29	9	15.9	101	61	-26
Poland		220	0.7	7	24	..	..	..	..	..	..	..	..
Portugal	♦	270	1.3	27	128	4.1	19	51	147	18.9	87	69	..
Spain	♦	450	1.7	28	110	4.1	14	43	30	21.4	70	57	-3
Sweden	♦	278	2.2	32	25	1.9	14	36	-28	10.9	85	69	-48
Switzerland	♦	281	2.0	33	42	1.5	10	54	-32	6.1	43	60	-69
Turkey		802	0.5	20	126	..	..	..	..	..	..	..	..
UK		262	1.9	20	48	2.2	16	47	1	7.6	56	71	-43
OECD		343	2.4	22	43	..	..	..	..	..	..	..	..

See Annex 3 for data sources, notes and comments.

TRANSPORT AND COMMUNICATION

Road fuel prices and taxes

Title: TR-PCTX.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/18/1999

		Diesel				Leaded premium				Unleaded gasoline		Energy consumption by road transport		
		Price US$/litre		Taxation % of price		Price US$/litre		Taxation % of price		Price US$/litre	Taxation % of price	Share % of total	Total Mtoe	Change %
		1980	1996	1980	1996	1980	1996	1980	1996	1995	1996	1996	1996	since 1980
Canada	♦	0.52	0.38	..	40	..	n.app.	..	n.app.	0.42	49	73	36.7	5
Mexico	♦	..	0.40	..	13	..	0.53	..	13	0.55	13	91	32.6	118
USA	♦	0.44	0.29	15	36	0.55	n.app.	..	n.app.	0.33	27	80	446.3	29
Japan	♦	0.66	0.32	24	53	..	n.app.	..	n.app.	0.54	54	82	73.5	69
Korea	♦	0.91	0.38	..	..	3.60	1.03	..	..	0.88	..	76	22.3	2081
Australia		..	..	..	..	0.48	0.50	19	59	0.50	55	79	20.6	47
N.Zealand	♦	0.65	0.25	2	1	0.83	n.app.	28	n.app.	0.52	48	51	2.2	35
Austria		0.82	0.47	33	52	0.90	n.app.	42	n.app.	0.70	67	86	5.6	35
Belgium		0.52	0.48	34	54	0.95	0.84	53	75	0.77	73	81	7.4	46
Czech R.		..	0.97	..	51	..	1.49	..	60	1.45	61	86	3.3	57
Denmark	♦	0.37	0.35	0	44	0.90	n.app.	59	n.app.	0.67	70	75	3.7	54
Finland		..	0.45	..	54	0.93	n.app.	36	n.app.	0.80	75	84	3.5	36
France	♦	0.69	0.50	47	64	0.98	0.87	58	81	0.84	80	85	39.7	41
Germany		..	0.44	..	59	..	0.72	..	74	0.67	74	86	55.2	37
w.Germany		0.66	..	41	..	0.76	..	49	..	..	..	..	..	..
Greece		0.60	0.48	13	57	1.40	0.79	42	72	0.73	68	73	4.9	110
Hungary		..	1.22	..	65	..	1.40	18	70	1.37	66	84	2.1	13
Iceland	♦	..	0.30	..	20	..	n.app.	..	n.app.	0.88	70	64	0.2	69
Ireland		0.69	0.79	28	42	0.96	0.87	48	66	0.79	65	81	2.1	39
Italy		0.55	0.66	8	62	1.41	1.03	61	75	0.98	73	89	35.4	59
Luxembourg		0.45	0.43	17	54	0.70	0.66	44	68	0.59	65	84	1.2	173
Netherlands		0.47	0.60	23	48	0.82	0.89	52	75	0.83	72	72	9.7	40
Norway		0.31	0.58	1	55	0.72	0.87	52	68	0.80	72	68	3.2	65
Poland		..	0.59	..	37	..	0.88	..	62	0.85	59	88	8.8	25
Portugal		0.84	0.69	7	59	2.24	1.09	61	74	1.07	71	85	4.5	129
Spain		0.64	0.56	25	55	1.29	0.85	35	69	0.80	67	78	22.2	108
Sweden		0.33	0.48	8	49	0.67	0.74	49	79	0.71	74	84	6.5	25
Switzerland		0.82	0.42	51	75	0.79	0.52	51	71	0.48	69	75	4.9	41
Turkey		0.88	0.94	..	61	1.51	1.30	..	69	1.30	66	86	11.0	126
UK		0.77	0.67	40	70	0.88	0.84	46	79	0.77	76	78	38.8	46

See Annex 3 for data sources, notes and comments.

TRANSPORT AND COMMUNICATION

Communication tools

Title:
RADIO.EPS
Creator:
Freelance Plus 3.01
Preview:
This EPS picture was not saved with a preview included in it.
Comment:
This EPS picture will print to a PostScript printer, but not to other types of printers.

	Internet hosts per 1000 inhabitants	Computers per 1000 inhabitants	TVs in use per 1000 inhabitants			Radios in use per 1000 inhabitants			Daily newspapers per 1000 inhabitants	
	1999	1997	1994	% change since 1970	% change since 1980	1994	% change since 1970	% change since 1980	1994	% change since 1980
Canada	82.2	364	685	106	59	1051	50	46	189	-14
Mexico	1.4	41	163	353	186	256	131	91	113	-9
United States	91.5	450	817	98	19	2122	50	6	228	-16
Japan	14.7	228	681	103	26	912	309	35	576	2
Korea	6.1	124	323	1600	96	1017	707	94	404	92
Australia	49.2	366	489	122	27	1291	123	18	258	-20
New Zealand	40.4	320	510	82	54	991	16	12	297	-13
Austria	22.7	246	480	89	23	619	44	22	472	34
Belgium	21.6	249	453	59	17	774	38	6	321	38
Czech Rep.	7.7	81	478	..	..	631	..	..	219	..
Denmark	70.0	349	539	45	8	1036	48	12	365	0
Finland	111.6	354	511	96	23	1003	131	20	473	-6
France	14.0	234	591	150	67	891	81	20	237	23
Germany	21.4	231	560	..	..	935	..	..	317	-15
Greece	5.9	73	206	881	20	418	270	22	156	30
Hungary	9.1	90	429	109	38	625	80	25	228	-8
Iceland	81.1	356	350	58	23	793	29	12	515	-6
Ireland	21.8	263	302	100	31	636	172	70	170	-26
Italy	9.2	158	437	96	12	802	41	33	105	24
Luxembourg	27.5	300	374	79	51	636	37	16	384	4
Netherlands	47.2	292	494	108	24	909	61	40	334	2
Norway	82.0	363	428	62	22	799	26	21	607	31
Poland	3.0	55	308	115	25	441	105	48	141	-40
Portugal	6.3	103	321	473	103	233	50	37	41	-16
Spain	11.7	127	402	230	59	312	37	21	104	12
Sweden	76.5	353	475	4	3	879	89	4	483	-9
Switzerland	47.2	299	416	72	14	841	41	3	409	4
Turkey	1.3	20	181	1545	129	162	60	43	44	-21
United Kingdom	34.6	283	439	35	9	1429	129	50	351	-16

See Annex 3 for data sources, notes and comments.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

Household consumption expenditure by type of good

Title: FIGHOUS.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

percentage of PFCE

	Durable goods				Semi-durable goods				Non-durable goods				Services			
	1970	1980	1996		1970	1980	1996		1970	1980	1996		1970	1980	1996	
Canada	13	14	13		13	12	9		33	30	26		42	44	53	
Mexico	..	..	7		..	..	..		..	..	43		..	..	50	
United States	10	9	10		15	13	11		29	29	20		45	49	58	
Japan	6	6	8		14	13	10		37	33	24		42	48	58	
Korea	2	3	8		14	13	9		63	57	36		21	27	47	
New Zealand	..	..	23		..	..	..		..	..	26		..	..	51	
Austria	..	12	12		..	13	9		..	35	27		..	40	51	
Denmark	12	9	11	*1995*	17	14	14	*1995*	41	41	31	*1995*	30	36	43	*1995*
Finland	10	11	9		15	11	9		42	43	35		33	34	47	
France	7	9	7		19	17	13		40	38	33		34	37	47	
Greece	4	6	5	*1995*	15	13	11	*1995*	50	51	48	*1995*	30	30	35	*1995*
Italy	48	40	31		14	20	18		7	11	10		30	29	41	
Netherlands	..	..	9		..	..	14		..	..	25		..	..	52	
Portugal	..	..	9	*1995*	..	..	17	*1995*	..	..	37	*1995*	..	..	37	*1995*
Sweden	..	10	8		..	17	13		..	38	32		..	35	47	
United Kingdom	8	10	10		17	17	16		43	39	29		32	35	46	

See Annex 3 for data sources, notes and comments.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

Food consumption

Title: FOOD2.EPS
Creator: Freelance Plus 3.01
CreationDate: 7/8/1998

	Meat			Vegetables			Fruit			Cereals			Fish		
	kg/cap	% Change		kg/cap	% Change		kg/cap	% Change		kg/cap	% Change		kg/cap	% Change	
	1995	70-95	80-95	1995	70-95	80-95	1995	70-95	80-95	1995	70-95	80-95	1995(a)	70-95	80-95
Canada	94	-2	-4	109	35	18	127	41	5	95	5	9	21	45	7
Mexico	45	85	21	31	42	-4	112	44	15	177	6	3	11	183	15
USA	119	12	10	110	27	15	123	29	8	115	44	32	22	50	45
Japan	44	151	47	109	-6	-3	60	-4	-6	129	-10	-5	71	11	8
Korea	39	657	213	188	95	3	88	383	157	168	-22	-14	52	193	29
Australia	104	-2	-4	84	40	34	92	-11	-5	105	-2	18	18	39	31
N.Zealand	121	13	17	98	22	4	123	69	47	97	19	11	21	33	41
Austria	106	39	12	75	12	-13	135	17	5	95	-20	6	10	27	69
Belgium-Lux.	90	17	1	123	40	66	118	44	38	100	4	-3	20	23	11
Czech R.	91	..	..	72	..	..	80	..	..	120	..	..	5	..	26
Denmark	102	80	28	78	49	38	73	6	24	104	18	22	20	-6	-3
Finland	65	44	12	61	207	77	67	30	-25	82	-21	-14	33	50	17
France	98	13	-3	125	-5	12	101	15	51	113	11	10	26	30	13
Germany	82	4	-14	78	28	17	110	4	5	88	-9	-12	13	9	17
Greece	79	62	22	234	31	19	176	3	6	148	-8	5	24	51	56
Hungary	81	1	-18	80	-9	-5	54	-28	-31	120	-31	-21	4	15	1
Iceland	69	11	1	39	176	55	83	68	35	93	4	16	92	29	8
Ireland	88	23	11	73	58	-8	58	21	2	132	5	10	20	74	19
Italy	85	57	13	150	-7	-7	126	-9	4	159	-15	-13	22	67	47
Netherlands	89	49	26	77	-13	23	156	71	38	69	-8	-11	14	8	48
Norway	59	50	12	60	20	-2	115	47	34	116	27	10	50	18	15
Poland	69	30	-10	126	13	22	42	39	7	155	-20	-14	9	-21	-20
Portugal	77	147	66	152	24	43	112	56	113	127	-8	5	58	-13	..
Spain	100	118	43	127	-3	-14	114	34	-4	103	-7	-4	37	21	18
Sweden	64	22	1	61	60	29	92	6	13	99	27	17	28	-3	0
Switzerland	73	3	-14	88	17	-4	112	-20	-21	101	-8	-4	13	31	38
Turkey	19	21	27	192	57	33	150	-19	-16	233	14	5	9	95	30
UK	73	1	4	87	17	13	81	30	36	94	-4	4	19	-10	18
N. America	99	10	7	91	22	11	121	32	9	128	33	22	20	58	40
Australia-NZ	107	1	-1	87	35	26	97	0	3	103	1	17	20	45	40
OECD Europe 21	76	22	1	120	17	13	108	9	10	128	-1	-1	19	13	18
EU 15	86	27	5	110	8	7	109	13	16	109	-6	-4	22	17	24
OECD 28	79	23	8	110	17	9	106	19	11	129	5	4	27	25	18

See Annex 3 for data sources, notes and comments.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

Paper consumption and recycling

Title: PAPER.EPS
Creator: Freelance Plus 3.01
CreationDate: 7/23/1998

		Total paper consumption			Newspapers			Printing & writing			Wrapping & packaging			Household & sanitary paper			Recycling rate	
		kg/cap.	% change since		kg/cap.	% change since		kg/cap.	% change since		kg/cap.	% change since		kg/cap.	% change since		%	absolute change since
		1996	1970	1980	1996	1970	1980	1996	1970	1980	1996	1970	1980	1996	1970	1980	1996	1980
Canada		220	40	32	14	-54	-62	86	230	115	104	30	29	19	91	56	33	13
Mexico	♦	36	47	2	3	0	-4	6	-15	-30	21	83	8	5	317	73	2	..
United States	♦	331	36	24	44	-1	-7	95	100	51	152	29	22	23	39	32	35	8
Japan		243	101	58	29	51	24	86	300	156	97	63	44	13	173	62	51	4
Korea		153	1293	275	29	768	389	29	..	358	71	..	198	7	..	709	53	16
Australia		149	28	8	41	17	8	49	173	94	45	-12	-30	11	108	40	..	..
New Zealand		161	31	28	13	-61	-46	20	23	10	84	38	52	22	227	79	27	10
Austria		226	178	81	55	299	202	41	169	175	116	366	59	9	8	-5	65	35
Belgium	♦	192	84	44	25	38	29	65	100	36	85	95	75	11	135	39	12	-3
Czech Rep.		62	..	..	4	..	..	30	..	..	27	..	..	1	..	..	40	..
Denmark		218	43	53	50	64	67	65	122	75	44	-7	-15	8	59	166	44	18
Finland		409	160	77	60	131	108	180	309	207	110	0	-49	23	269	37	57	22
France		156	62	36	13	9	11	57	93	47	72	51	73	9	205	106	38	8
Germany		191	67	36	27	76	36	64	117	45	77	108	49	11	187	60	67	..
Greece	♦	88	302	100	4	11	-7	17	314	72	32	..	376	23	..	..	19	-3
Hungary		51	16	-19	8	59	45	15	41	18	18	-14	-48	5	-36	56	49	16
Iceland		104	26	24	21	42	22	19	113	33	-	-	-	-	-	-	36	..
Ireland		168	137	125	19	5	8	35	629	213	86	217	813	14	..	..	12	..
Italy		142	110	52	9	78	60	49	152	73	72	455	44	6	84	124	29	..
Netherlands	♦	210	50	36	35	22	9	56	32	16	110	86	95	11	105	26	77	32
Norway	♦	179	50	50	44	120	174	50	97	29	62	-11	17	13	116	81	41	20
Poland		44	32	9	2	-43	-57	18	177	181	15	17	-5	3	1804	-44	13	-20
Portugal		84	156	108	7	37	66	27	424	241	38	143	112	5	568	84	37	-1
Spain		134	213	86	12	116	184	35	276	75	71	206	81	8	886	146	52	5
Sweden		225	17	7	41	-4	15	73	119	17	84	8	190	25	35	11	54	20
Switzerland		209	41	29	38	42	17	74	47	30	72	120	17	17	332	66	67	32
Turkey		26	322	103	5	555	36	5	279	208	16	603	226	1	1320	697	34	..
United Kingdom		191	54	57	39	42	60	64	164	120	66	12	31	13	133	42	37	5

See Annex 3 for data sources, notes and comments.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

Household waste generation and management

Title: WAIFMW4A.EPS
Creator: Freelance Plus 3.01
CreationDate: 5/12/1998

		Municipal waste generated per capita		*of which:* Household waste	Private final consumption expenditure, per capita		Management of municipal waste % of amounts disposed of by		
		kg/cap. mid-1990s	% change since 1980	kg/cap. mid-1990s	1000 US$/cap. 1995	% change since 1980	Recycling/ compost. mid-1990s	Incineration mid-1990s	Landfill mid-1990s
Canada	♦	630	24	310	11.0	18.3	19	6	75
Mexico	♦	330	..	260	3.5	-7.1	1	-	99
USA	♦	720	19	..	16.8	31.6	27	16	57
Japan	♦	400	7	..	11.0	47.5	4	69	27
Korea	♦	390	..	..	6.3	164.9	24	4	72
Australia	♦	690	..	400	10.4	29.3	..	..	..
New Zealand	♦	..	..	390	8.9	18.3	..	..	..
Austria	♦	480	*42*	310	10.1	32.3	38	14	48
Belgium	♦	470	..	..	11.0	21.7	14	31	55
Czech Rep.	♦	230	..	150	5.1	..	-	-	99
Denmark	♦	530	34	500	9.7	27.4	23	54	22
Finland	♦	410	..	180	7.5	21.6	33	2	65
France	♦	560	*8*	410	10.7	23.5	9	32	59
Germany	♦	400	..	380	10.4	*27.5*	29	17	51
Greece	♦	310	*20*	..	7.4	28.4	7	-	93
Hungary	♦	420	82	270	4.0	..	-	7	93
Iceland	♦	560	..	240	9.7	13.0	14	17	69
Ireland	♦	430	129	290	8.3	40.1	8	..	92
Italy	♦	470	89	400	11.1	33.5	..	6	94
Luxembourg	♦	530	51	250	16.5	36.3	28	43	28
Netherlands	♦	580	16	470	10.5	18.6	38	27	35
Norway	♦	620	49	300	9.2	30.2	15	16	69
Poland	♦	290	10	210	2.9	..	2	-	98
Portugal	♦	350	75	..	6.8	43.9	12	-	88
Spain	♦	370	35	..	7.8	28.8	12	4	83
Sweden	♦	440	21	360	8.3	7.5	19	42	39
Switzerland	♦	610	*32*	430	12.0	8.2	40	46	14
Turkey	♦	590	44	..	3.3	12.5	2	2	81
UK	♦	490	..	460	10.6	41.5	7	9	83
* **OECD	♦	530	25	..	11.4	38.3	..	..	..

See Annex 3 for data sources, notes and comments.

RECREATION AND TOURISM

International tourist receipts

Title: TOUR.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

		Index (1991=100)													million US$
		1980	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1996
Canada		65	73	88	82	86	85	102	100	101	108	122	135	145	8812
Mexico		..	..	..	..	60	64	66	100	89	82	88	120	118	6897
USA		34	46	52	58	71	82	93	100	110	113	111	113	116	64374
Japan	♦	40	64	58	71	87	100	116	100	97	83	74	64	97	4281
Korea		..	..	..	..	..	..	..	..	..	..	..	..	..	5430
Australia		34	42	48	69	89	78	86	100	104	111	137	152	164	8128
N.Zealand		24	51	64	61	100	95	100	100	103	81	91	126	133	2648
Austria	♦	76	76	75	78	85	95	99	100	96	92	85	81	79	13821
Belgium	♦	69	91	90	101	112	105	103	100	103	108	117	122	123	5484
Czech Rep.		..	..	..	..	..	..	..	..	..	..	..	..	..	3802
Denmark		62	78	77	79	81	80	95	100	101	88	89	87	81	3425
Finland		104	87	83	94	101	100	97	100	115	139	143	146	148	1674
France		55	71	65	67	75	92	94	100	108	106	107	105	109	28182
Germany		..	..	..	..	..	..	..	100	98	95	117	118	119	15787
Greece	♦	125	130	138	138	141	116	121	100	131	144	159	148	128	3684
Hungary		..	..	..	..	..	..	..	..	..	..	..	..	..	2261
Iceland		27	58	66	76	87	95	108	100	89	103	109	120	112	153
Ireland	♦	65	67	64	68	77	86	96	100	90	103	120	133	153	2568
Italy	♦	83	98	85	87	85	81	110	100	110	138	147	163	153	28245
Netherlands		54	74	73	74	76	86	85	100	110	102	100	119	115	6144
Norway		75	85	95	95	100	92	93	100	111	117	138	126	128	2343
Poland		..	..	..	..	..	..	..	..	..	..	..	..	..	8400
Portugal		57	67	72	87	91	99	103	100	84	104	95	96	93	4325
Spain		65	100	112	116	118	109	100	100	108	112	125	131	131	25892
Sweden		57	93	97	108	114	122	116	100	106	118	121	134	132	3674
Switzerland		77	92	90	93	96	101	99	100	101	104	104	100	96	8723
Turkey	♦	16	95	76	98	135	133	131	100	135	142	214	187	223	6000
UK		80	103	102	110	105	108	110	100	102	120	124	146	151	20020
North America	♦	49	49	56	61	72	83	94	100	109	112	112	116	119	80082
EU	♦	86	88	87	91	94	97	102	100	104	111	117	124	123	162926
OECD Europe	♦	85	89	87	91	95	98	102	100	105	112	119	124	123	194608
OECD	♦	73	76	77	82	88	93	100	100	106	111	116	121	123	295176

See Annex 3 for data sources, notes and comments.

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Energy consumption

Title: TFC2.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

Title: TFC3.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Energy consumption intensity and structure

		Total Final Energy Consumption			Intensity per unit of GDP (a)			Intensity per capita		
		(Mtoe)	Change (%)		(Toe/1 000 US$)	Change (%)		(Toe/capita)	Change (%)	
		1996	1970-80	1980-96	1996	1970-80	1980-96	1996	1970-80	1980-96
Canada		182	34.9	16.7	0.31	-11.4	-18.9	6.1	16.8	-4.2
Mexico	♦	102	86.8	46.3	0.19	2.7	12.2	1.1	41.8	5.5
USA		1443	9.1	9.4	0.21	-19.7	-27.8	5.4	-1.8	-6.2
Japan		337	25.7	44.7	0.13	-18.5	-12.4	2.7	11.6	34.2
Korea	♦	120	96.3	241.6	0.22	2.4	-6.5	2.6	69.3	185.9
Australia		66	34.9	39.1	0.19	-3.0	-14.9	3.6	17.7	11.8
New Zealand		11	34.1	49.7	0.20	14.8	2.0	2.9	20.2	29.3
Austria		22	30.4	17.1	0.15	-8.6	-16.8	2.8	29.0	9.7
Belgium		40	8.1	22.9	0.22	-21.7	-5.5	4.0	6.0	19.2
Czech Republic	♦	28	10.5	-28.3	0.25	..	..	2.7	5.2	-28.2
Denmark		16	-5.3	7.5	0.15	-24.1	-24.2	3.1	-8.9	4.6
Finland		23	21.1	18.4	0.28	-14.4	-13.9	4.5	16.7	10.4
France		162	18.8	16.3	0.15	-14.2	-14.1	2.8	11.9	7.3
Germany		249	14.1	-2.0	0.17	..	..	3.0	13.2	-6.3
Greece		17	76.1	48.1	0.16	11.2	16.0	1.6	60.6	36.3
Hungary	♦	18	36.5	-19.2	0.23	..	..	1.8	32.2	-13.9
Iceland		2	55.6	40.6	0.37	-15.9	-1.6	6.9	39.9	19.1
Ireland		9	36.1	31.5	0.15	-14.3	-34.3	2.4	18.0	23.4
Italy		124	21.7	18.8	0.12	-14.3	-10.5	2.2	16.1	16.7
Luxembourg		3	11.1	12.7	0.26	-13.9	-45.7	7.6	3.5	-1.1
Netherlands		59	39.3	15.8	0.21	4.4	-18.5	3.8	28.3	5.5
Norway		20	28.6	20.1	0.20	-19.1	-25.0	4.5	22.1	12.0
Poland		70	43.8	-12.1	0.32	..	..	1.8	31.5	-19.0
Portugal		15	66.5	82.2	0.13	4.8	21.4	1.5	46.9	80.1
Spain		72	61.9	44.7	0.13	14.4	-1.7	1.8	46.7	37.8
Sweden		36	5.4	2.9	0.24	-13.1	-18.7	4.1	2.0	-3.3
Switzerland		21	15.1	17.5	0.14	-4.8	-3.7	2.9	13.0	5.6
Turkey		50	74.2	87.7	0.14	17.0	-10.1	0.8	39.6	33.0
UK		162	-3.0	19.9	0.16	-19.9	-17.2	2.8	-4.2	14.9
North America	♦	1727	11.1	11.8	0.22	-17.9	-25.1	4.4	-2.5	-8.2
OECD Pacific	♦	534	24.6	65.4	0.15	-15.6	-8.1	2.8	10.8	47.8
OECD Europe	♦	1219	17.0	12.0	0.16	..	..	2.4	10.9	3.3
OECD	♦	3479	14.6	17.7	0.18	..	..	3.2	4.7	3.7

Energy consumption structure

% of total final energy consumption

		Industry			Transport			Residential			Other		
		1970	1980	1996	1970	1980	1996	1970	1980	1996	1970	1980	1996
Canada		33.9	36.1	35.3	25.2	28.8	27.8	22.5	18.3	17.9	18.4	16.8	18.9
Mexico	♦	36.4	36.7	40.6	29.0	35.1	35.1	22.4	13.8	17.1	12.1	14.4	7.3
USA		34.1	32.8	25.4	30.0	32.8	38.7	18.9	16.4	18.1	17.0	18.0	17.8
Japan		57.9	47.5	39.6	18.5	23.8	26.7	9.5	11.1	14.5	14.1	17.6	19.1
Korea	♦	31.5	38.4	44.2	11.9	13.9	24.4	51.5	35.1	9.8	5.0	12.6	21.5
Australia		43.6	38.4	35.0	32.6	37.3	39.4	12.7	12.7	12.5	11.1	11.6	13.1
New Zealand		28.2	33.7	32.9	35.4	35.2	41.7	16.3	14.3	12.2	20.1	16.8	13.2
Austria		32.4	30.9	23.3	21.7	24.2	29.4	37.6	34.7	30.9	8.3	10.2	16.4
Belgium		44.0	39.4	35.0	14.5	18.1	22.7	33.1	29.3	26.6	8.5	13.1	15.8
Czech Republic	♦	57.0	56.5	51.8	6.5	6.9	13.8	25.7	22.7	22.0	10.8	13.9	12.5
Denmark		22.9	20.2	17.8	19.5	23.8	29.8	43.6	36.3	30.1	14.1	19.6	22.2
Finland		30.5	34.4	43.7	13.1	15.3	17.8	21.4	23.0	23.1	35.0	27.3	15.5
France		43.4	35.9	28.1	18.0	23.6	29.0	13.4	13.1	18.1	25.2	27.5	24.8
Germany		39.2	37.5	29.2	15.5	18.8	25.8	26.2	21.8	29.0	19.1	21.9	16.0
Greece		32.5	34.7	24.9	29.6	34.8	39.1	23.0	17.3	21.3	14.9	13.2	14.7
Hungary	♦	43.0	43.4	27.3	13.5	11.6	13.6	10.7	12.6	21.7	32.8	32.4	37.4
Iceland		19.2	26.8	25.9	18.7	14.5	17.5	44.5	40.6	29.0	17.7	18.2	27.6
Ireland		31.7	32.8	25.9	24.1	26.9	29.5	37.1	28.0	25.2	7.1	12.4	19.4
Italy		46.7	39.7	32.1	20.0	24.8	32.1	26.5	28.0	26.4	6.8	7.6	9.4
Luxembourg		72.9	58.7	31.6	7.8	18.2	44.0	16.9	19.3	20.1	2.4	3.8	4.3
Netherlands		36.7	38.3	31.6	17.1	17.2	22.7	31.1	27.8	20.8	15.1	16.7	24.9
Norway		45.2	45.4	37.1	20.1	19.4	23.5	15.8	19.5	20.8	19.0	15.6	18.7
Poland		43.0	45.9	36.7	9.0	11.3	14.2	25.4	21.7	33.2	22.7	21.1	15.8
Portugal		42.3	43.2	37.4	28.8	31.5	34.6	16.4	12.5	13.0	12.5	12.8	15.1
Spain		46.9	43.3	31.6	27.4	32.8	39.6	13.4	10.5	14.6	12.3	13.4	14.2
Sweden		40.3	36.3	37.2	15.3	17.4	21.5	31.4	28.1	23.9	13.0	18.2	17.4
Switzerland		25.7	23.1	18.0	23.8	25.5	31.6	7.8	31.2	29.5	42.7	20.2	21.0
Turkey		15.4	26.4	30.2	21.5	21.0	25.9	56.3	46.1	31.9	6.9	6.6	12.0
UK		42.4	32.0	25.8	19.2	25.1	30.7	24.3	26.6	27.2	14.1	16.4	16.3
North America	♦	32.9	33.3	27.3	30.2	32.5	37.3	19.3	16.4	18.1	17.6	17.7	17.3
OECD Pacific	♦	52.4	44.9	40.0	20.5	25.0	28.1	12.4	14.0	13.2	14.7	16.2	18.8
OECD Europe	♦	40.4	37.8	30.5	17.8	20.7	27.2	23.8	23.0	25.1	18.0	18.5	17.2
OECD	♦	37.6	36.2	30.4	24.8	27.3	32.4	20.2	18.6	19.8	17.5	17.8	17.5

See Annex 3 for data sources, notes and comments.

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Air emissions from residential energy use
Emission intensities per capita

Title: TRAIR2.EPS
Creator: Freelance Plus 3.01
CreationDate: 4/13/1999

		CO2			NOx			SOx		
		tonne/cap. 1996	% of total emissions 1996	% change since 1980	kg/cap. 1996	% of total emissions 1996	% change since 1980	kg/cap. 1996	% of total emissions 1996	% change since 1980
Canada	♦	1.6	10	-10	2.2	3.3	..	1.7	1.8	..
Mexico		0.2	7	458	..	..	..	..	..	..
USA	♦	1.4	7	-2	2.4	3.2	-5	2.1	3.3	-38
Japan		0.6	6	75	..	..	..	..	..	..
Korea	♦	0.5	6	-37	1.5	5.6	..	2.6	7.9	..
Australia	♦	0.3	2	23	5.2	4.4	..	..	..	..
N. Zealand	♦	0.1	1	-34	4.4	9.5	..	2.3	17.7	..
Austria	♦	1.7	22	-14	3.4	16.3	7	2.0	34.0	-82
Belgium		2.3	19	-4	1.7	5.0	..	3.8	16.3	..
Czech Rep.	♦	0.9	8	-67	..	..	..	..	..	..
Denmark	♦	1.1	8	-58	1.5	2.7	-44	2.3	6.7	-83
Finland		1.0	8	-50	2.0	3.9	-19	2.3	11.2	-74
France	♦	0.5	8	-3	1.5	5.2	-7	2.3	13.5	-69
Germany	♦	1.7	16	11	2.0	8.7	..	3.2	14.4	..
Greece		0.6	8	100	5.3	14.8	..	1.8	3.4	..
Hungary	♦	0.6	10	8	1.8	9.8	-27	9.8	14.7	-71
Iceland	♦	0.1	2	-82	0.2	0.1	-65	0.4	1.1	-68
Ireland	♦	1.5	15	-4	2.1	6.1	81	9.0	20.4	-8
Italy		1.2	16	-6	..	..	..	..	..	..
Luxembourg		3.7	17	4	..	..	..	..	..	..
Netherlands	♦	1.5	13	-23	3.2	10.2	4	0.2	2.0	-87
Norway		0.2	3	-62	0.7	1.4	-36	0.3	3.6	..
Poland		1.1	12	-31	..	..	..	..	..	..
Portugal	♦	0.2	4	82	2.0	5.5	..	0.8	2.2	..
Spain	♦	0.4	6	52	0.6	1.8	82	2.0	3.7	37
Sweden	♦	0.6	8	-76	1.1	2.8	-64	0.8	7.1	-92
Switzerland	♦	1.8	29	-5	2.0	10.4	3	2.1	43.1	-68
Turkey		0.4	14	57	3.0	24.4	90	..	..	..
UK	♦	1.5	15	9	1.9	5.6	4	2.2	6.3	-71
OECD		1.0	9	-2	..	..	..	..	..	..

See Annex 3 for data sources, notes and comments.

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Energy prices and taxes

Selected energy prices for households, mid-1990s

Title: ENPRCS1B.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

		Oil		Natural gas		Electricity		Real energy end-use prices
		Price (US$/1 000 l.) 1996	Tax (%) 1996	Price (US$/$10^7$ kcal) 1996	Tax (%) 1996	Price (US$/kWh) 1996	Tax (%) 1996	% change since 1980
Canada		281	..	170	..	0.060	..	1.4
Mexico	♦	..	..	..	..	0.048	13	*70.6*
USA		279	..	242	..	0.084	..	-35.1
Japan		407	3	1294	3	0.230	5	-43.4
Korea		..	..	..	..	0.103	..	-18.6
Australia		..	..	333	..	0.083	..	-4.5
New Zealand		..	..	416	14	0.088	11	-28.2
Austria		452	39	468	17	0.192	17	-29.2
Belgium		282	24	452	21	0.191	18	-26.6
Czech Republic		579	66	132	5	0.039	5	43.4
Denmark		736	61	739	25	0.215	58	-12.1
Finland		346	31	181	25	0.109	18	-23.4
France		429	40	470	17	0.164	23	-21.9
Germany		322	30	439	19	0.180	13	-29.0
Greece		574	63	..	..	0.115	15	-19.9
Hungary		264	9	136	11	0.060	11	18.4
Iceland	♦	310	14	n. app.	n. app.	0.093	25	..
Ireland		421	27	473	11	0.132	11	-19.8
Italy		892	70	667	45	0.178	25	-1.7
Luxembourg		286	13	319	6	0.142	6	-15.0
Netherlands		380	42	363	23	0.148	24	-7.3
Norway	♦	549	33	n. app.	n. app.	0.081	29	43.4
Poland		337	11	236	11	0.067	13	..
Portugal		701	61	..	..	0.176	5	-44.0
Spain		359	42	613	15	0.191	14	-12.2
Sweden		628	60	..	..	0.110	34	1.9
Switzerland		260	12	506	7	0.160	6	-41.8
Turkey		544	63	209	7	0.087	17	-0.1
UK		258	22	326	7	0.125	7	-24.7

♦ *See Annex 3 for data sources, notes and comments.* *.. not available - nil or negligible n. app. not applicable*

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Total water abstractions

Title: NRTFWAIL.EPS
Creator: Freelance Plus 3.01
CreationDate: 5/12/1998

		Total freshwater abstractions				Abstractions for public water supply	
		intensities as % of available resources		intensities per capita		as % of total	per capita
		% Latest year avail.	Absolute change since 1980	m3/cap./year Latest year avail.	% change since 1980	% Latest year avail.	m3/cap./day Latest year avail.
Canada	♦	1.6	0.3	1600	6	11.3	0.497
Mexico	♦	14.5	3.5	780	-3	11.5	0.246
USA	♦	18.9	-2.0	1880	-17	11.4	0.585
Japan	♦	20.8	0.5	720	-5	18.0	0.357
Korea	♦	28.5	7.4	530	15	26.2	0.381
Australia	♦	4.3	1.2	840	14	20.8	0.480
New Zealand	♦	0.6	0.2	570	50	9.2	0.144
Austria	♦	2.7	0.1	280	-3	31.0	0.239
Belgium	♦	42.5	..	690	..	10.6	0.200
Czech Republic		15.6	-7.1	240	-31	36.8	0.244
Denmark	♦	15.7	-4.0	180	-25	53.5	0.268
Finland	♦	2.2	-1.1	480	-38	17.2	0.226
France	♦	23.9	5.7	700	23	14.6	0.281
Germany	♦	24.4	*-0.1*	530	*-4*	13.4	0.195
Greece	¨	13.1	5.4	820	58	10.0	0.225
Hungary	♦	5.0	1.0	600	33	12.9	0.212
Iceland	♦	0.1	-	590	26	48.4	0.781
Ireland	♦	2.3	0.2	330	6	40.0	0.359
Italy	♦	32.2	-	990	-1	14.1	0.383
Luxembourg	♦	3.4	..	140	..	58.9	0.223
Netherlands	♦	4.9	-5.2	290	-55	28.6	0.224
Norway		..	..	..	..	..	..
Poland	♦	18.7	-3.8	310	-23	19.4	0.162
Portugal	♦	11.9	..	870	..	8.7	0.208
Spain	♦	28.7	-5.7	850	-21	12.9	0.300
Sweden	♦	1.5	-0.8	310	-37	34.6	0.290
Switzerland	♦	4.9	-	370	-10	42.1	0.425
Turkey	♦	15.2	8.3	560	56	13.1	0.200
UK	♦	*14.6*	-6.5	*180*	*-25*	67.8	*0.336*
OECD	♦	11.3	-	940	*-11*	14.1	0.360

See Annex 3 for data sources, notes and comments..

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Public water supply and price

Title: WAT-PUB.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/10/1999

Average prices for public freshwater supply to households, selected cities, 1996

		Price US$/m3			Price US$/m3			Price US$/m3			Price US$/m3
Canada	Ottawa	1.70	Belgium	Brussels	1.80	Germany	(nat. average) ♦	1.70	Portugal	Lisbon	0.99
	Toronto	0.63		Antwerp	0.97	Hungary	Budapest	0.28		Coimbra	1.02
	Winnipeg	0.75		Liège	1.50		Debrecen	0.55		Porto	0.98
USA	Washington	0.80	Czech Rep.	Prague	0.37		Pecs	0.69	Spain	Madrid	0.85
	New York	0.88		Brno	0.29	Iceland	Reykjavik	0.61		Barcelona	0.81
	Los Angeles	0.60		Ostrava	0.38		Hafnarfjorour	0.51		Bilbao	0.48
Japan	Tokyo	1.16	Denmark	Copenhagen	1.34	Italy	Rome	0.33	Sweden	Stockholm	0.86
	Osaka	0.70		Aarhus	0.89		Bologna	0.65		Goteborg	0.58
	Sapporo	1.29		Odense	0.98		Milan	0.13		Malmo	0.99
Australia	Sydney	0.93	Finland	Helsinki	0.85	Luxembourg	Luxembourg	1.64	Switzerland	Berne	1.22
	Brisbane	0.80		Tampere	0.90	Netherlands	Amsterdam	1.20		Geneva	2.25
	Melbourne	0.80		Vaasa	1.32		The Hague	1.92		Zurich	2.26
N. Zealand	Wellington ♦	0.98	France	Paris	0.93		Utrecht	0.94	Turkey	Ankara ♦	0.18
Austria	Vienna	1.75		Bordeaux	1.39	Norway	Oslo ♦	0.32		Canakkale ♦	0.20
	Salzburg	1.59		Lyon	1.78		Bergen ♦	1.14		Eskisehir ♦	0.19
	Linz	1.11					Trondheim ♦	1.05	UK	London ♦	0.78
										Bristol ¨	0.78
										Manchester ¨	0.93

¨ *See Annex 3 for data sources, notes and comments.*

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Waste water treatment

Sewerage and sewage treatment connection rates, mid-1990s*

Title: WATPOPS1.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/25/1999

** or latest available year. Data prior to 1990 are not taken into account.*

Trends in sewage treatment connection rates - population connected in per cent of national population

Title: WATPOPSA.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/11/1999

Title: WATPOPSB.EPS
Creator: Freelance Plus 3.01
CreationDate: 3/10/1999

HOUSING RELATED ENERGY AND WATER CONSUMPTION

Waste water treatment (continued)

		Waste water treatment Public sewage treatment connection rates						Sewerage network connection rates mid-1990s	Public expenditure on waste water treatment mid-1990s	
		early 1980s			mid-1990s					
		Total	*of which:* Secondary treatment	Tertiary treatment	Total	*of which:* Secondary treatment	Tertiary treatment	Total	Total	*of which:* Investment
		% pop.	% pop.	% pop.	% pop.	% pop.	% pop.	% pop.	US$/capita	%
Canada	♦	64.0	25.0	25.0	78.0	26.0	33.0	91.0	66.7	60
Mexico	♦	..	..	..	21.8	19.2	..	64.6	4.8	45
USA	♦	65.8	27.1	22.8	..	..	..	..	105.0	47
Japan	♦	30.0	30.0	..	55.0	50.0	5.0	55.0	..	..
Korea	♦	8.3	..	..	52.6	51.7	-	..	62.5	79
Australia		..	..	..	..	..	..	..	41.9	68
New Zealand		59.0	49.0	..	..	..	..	82.5	..	..
Austria	♦	38.0	25.0	3.0	74.7	38.6	34.7	75.5	142.8	70
Belgium	♦	22.9	22.9	..	27.1	27.1	-	75.4	52.1	..
Czech Rep.	♦	43.7	..	..	59.2	..	..	73.5	57.3	100
Denmark	♦	..	..	..	87.4	13.7	71.6	87.4	105.4	..
Finland	♦	65.0	15.0	48.0	77.0	-	77.0	77.3	55.8	46
France	♦	61.5	..	..	77.0	..	..	79.0	114.9	36
Germany	♦	*79.9*	*64.7*	*5.0*	88.6	12.2	72.2	92.2	109.0	60
Greece	♦	0.5	0.5	..	56.2	14.2	9.6	67.5	10.6	100
Hungary	♦	19.0	12.0	..	32.0	22.0	1.0	43.0	28.1	100
Iceland	♦	..	-	-	4.0	-	-	90.0	..	..
Ireland		11.2	11.0	..	..	..	..	68.0	..	..
Italy		30.0	..	..	..	..	..	..	29.4	83
Luxembourg		81.0	65.0	..	87.5	57.4	11.0	87.5	..	..
Netherlands	♦	73.0	62.0	3.0	97.4	42.3	55.0	98.0	109.6	30
Norway	♦	34.0	1.0	26.0	67.0	1.0	51.0	80.0	78.1	46
Poland	♦	..	..	..	46.6	32.4	8.2	46.6	39.0	100
Portugal	♦	2.3	..	..	20.7	15.6	1.3	55.5	32.4	80
Spain	♦	17.9	9.1	..	48.3	34.4	3.3	..	24.4	65
Sweden	♦	82.0	20.0	61.0	..	..	..	..	63.3	44
Switzerland		73.0	32.0	41.0	94.0	23.0	71.0	94.0	101.8	42
Turkey	♦	-	-	..	12.1	3.6	-	62.5	..	..
UK	♦	*82.0*	*51.0*	*25.0*	*86.0*	*64.0*	*14.0*	*97.0*	11.1	27
**OECD	♦	*51.0*	..	..	60.0	..	..	..	..	..

¨ *See Annex 3 for data sources, notes and comments.*

ANNEX 1
PROPOSED INDICATORS - INDICATOR SHEETS

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INDICATOR SHEETS - ENVIRONMENTALLY SIGNIFICANT CONSUMPTION TRENDS AND PATTERNS

The answer to the question "is more consumption good or bad" depends on the perspective from which consumption is analysed. From an individual consumer's point of view, who derives utility from consumption and whose objective is to maximise his utility, increases in consumption may be seen as positive. From the environmental point of view, however, increases in consumption are often seen as negative, as these can lead to increases in emissions, pollution, congestion, etc.

Policy-makers can influence household consumption patterns only when they know what households consume and when they can make an assessment of the implications of current consumption patterns on the environment and on sustainable development. It is important to look at key trends in consumption levels and patterns to get a better understanding of significant changes and of the forces driving these changes.

- *Environmentally significant consumption trends and patterns cover major driving forces and indirect pressures. The proposed indicators relate to major general trends:*
- *economic trends including expenditure shares of GDP, saving rates, household and government consumption;*
- *socio-demographic trends including urbanisation (urban/rural population), household size, population characteristics such as dependency ratio, ageing index, etc.;*

These could further be complemented with background information on income distribution, employment/unemployment levels, and consumer prices.

- *key household consumption trends covering the following clusters or domains: transport and communication, consumption of durable and non-durable goods including food, recreation and tourism, and housing related energy and water use.*

The proposed indicators reflect trends in the level of consumption and related intensities (per capita and/or per unit of GDP), as well as structural changes over time. In some cases elasticities can be shown by comparing percentage changes in consumption to percentage changes in GDP over the same period. Some indicators may overlap because of the linkages between different consumption clusters.

Indicators on consumption trends and patterns are closely linked to consumer behaviour and are influenced by a number of policy measures. They further interact with production levels and patterns and with related resource use. Their purpose is to identify if, and to what extent, consumption levels in selected domains drive resource use (supply side) and affect environmental conditions and quality of life. They reveal major trends and point at changes and patterns, which require further analysis and possible action. They do not, however, provide a measure of the sustainability of the described trends and patterns. Scientific and policy-oriented interpretation is needed for them to acquire their full meaning.

ECONOMIC TRENDS

Proposed indicators	Comments
♦ Expenditure shares of GDP in US$ per capita, and as a % of GDP (include consumer expenditure, investment and net trade, stock building and balancing items). Standard SNA definitions are applied	♦ Describes the economic activity of a country and related trends ♦ Identifies the contribution of consumption expenditure to GDP
Saving rates ♦ Trends in annual public and private saving by country, measured as a % of GDP ♦ Genuine savings i.e. "the true rate of saving of a nation after accounting for the depreciation of produced assets, the depletion of natural resources, investments in human capital, and the global damages from carbon emissions"[22]	♦ Relates to the dynamics of creating and maintaining wealth; represents that part of disposable income that is not spent on final consumption of goods and services. Focus should be given to household savings ♦ The rate of genuine saving is determined by a wide range of macroeconomic, resource, and environmental policies This indicator has thus the potential to link the concerns of environmental policies to the interests of key economic ministers. Data currently not available
Government consumption ♦ Public final consumption expenditure – level and trends in US$ per capita and as % of GDP – structural changes, by purpose as % of total	♦ Describes major trends and structural changes in government consumption ♦ Data on consumption patterns and structural changes are not readily available
Household consumption ♦ Private final consumption expenditure (PFCE) – level and trends in US$ per capita and as % of GDP – structural changes, by purpose, by type of good, as % of total PFCE	♦ Describes major trends and structural changes in household's consumption

These indicators reflect basic trends and patterns, which drive most other indicators. They should be read in connection with data on consumer price indices for various groups (e.g. food, rent). They could also be complemented with information on income distribution and on employment/unemployment levels.

Data source: OECD National Accounts.

POLICY RELEVANCE

Economic activity is a major determinant of environmental performance and sustainable development. Economic growth on the one hand imposes a pressure on the environment through pollution emitted and resources drawn on by human activities. This raises issues concerning the evolution of the stock and quality of natural resources. On the other hand, economic growth provides opportunities to finance public expenditures for environmental protection, and to finance the replacement of man-made capital - thereby introducing cleaner and less resource-intensive technologies.

Households' expenditure generally accounts for about 60 per cent of GDP. Growth in private final consumption expenditure (PFCE) is thus a major determinant of environmental performance. It imposes a pressure on the environment through, for instance, the increased use of packaged or bulky goods. But it also provides opportunities to develop environmentally-friendly goods in response to consumer demand.

In many OECD countries, the government is a large consumer of goods and services, accounting for approximately 20-25 per cent of GDP. In 1996, OECD Environment Ministers agreed on a Council Recommendation on Improving the Environmental Performance of Government, to spur governments to reduce the environmental impacts of their own operations and to improve their decision-making processes.

22. *The World Bank. 1997. Expanding the Measure of Wealth – Indicators of Environmentally Sustainable Development, Environmentally Sustainable Development Studies and Monographs No. 17. Washington, DC.*

SOCIO-DEMOGRAPHIC TRENDS

Proposed indicators	Comments
♦ Household size	♦ Describes changes in the number and structure of households; can be related to consumer behaviour and to the structure of consumption expenditures ♦ International data are not readily available
Population structure	
♦ Urban versus rural population: in 1000 inhabitants, and as % of total population	♦ Describes the extent to which the population of a country concentrates in and around urban areas
♦ Dependency ratio (population <15 and >65 as a % of the potential labour force ages 15-65) in urban and rural areas	♦ Describes structural changes in the age distribution of the population; can be related to consumer behaviour and to the structure of consumption expenditures
♦ Ageing index (population >64/population < 15)	

These indicators reflect basic trends and patterns, which drive most other indicators. They could be complemented with indicators on the seasonal variations of population density in sensitive tourist receiving areas (e.g. coastal zones, mountains).

Data sources: OECD Labour Force Statistics; FAOSTAT.

POLICY RELEVANCE

Population is a major determinant of environmental conditions and trends. It influences production and consumption patterns and thus has bearing on the sustainability of development. Firstly, population density implies density of human activity and is often correlated with the concentration of pollution and with resource use. Secondly, population affects the environment through its structural elements (age classes, active population, size of households, etc.), which largely influence consumption patterns and waste production. Thirdly, overall population growth puts pressure on the available quantities of natural resources.

In almost all OECD countries, population and household structures have changed dramatically during the past few decades. In most countries these structural changes are more pronounced than those in the overall population size. The slowing of population growth is accompanied by two significant socio-demographic trends: an ageing of the population and an increase in the number of small households due to low fertility, increasing life expectancy and the movement of the baby boom generation up the age scale. These developments are particularly pronounced in urban areas. Although they seem to have only a limited direct impact on the environment, their cumulative effects can be substantial. They create new forms of time use and behavioural patterns. As a result, consumption and leisure activities, including tourism, have changed and the preference for private cars over other modes of transport has been encouraged. This has many immediate consequences on natural resource use, waste generation, landscapes and ecosystems, congestion, and the distribution of pollution and noise in time and space.

Trends in urbanisation levels have interacting effects on the environment. The spatial extension of larger cities conflicts with other land uses and puts additional stress on ecosystems outside these areas. As a result of congestion, pollution, and other environmental amenities, etc., living conditions in many urban areas deteriorate. This may in turn create a depopulation of many city centres in large urban areas and the development of smaller urban communities beyond the bounds of metropolitan areas, resulting in diminishing economies of scale and increased energy consumption, and causing further dependence on public infrastructure.

TRANSPORT AND COMMUNICATION - TRANSPORT

Proposed indicators	Comments
Passenger transport trends and patterns	
♦ Total in passenger-km and intensities in passenger-km per capita ♦ By mode (road, rail, air) in passenger-km, as % of total ♦ Road traffic by passenger cars in vehicle-km ♦ By type (share of public transport, in % of total mode)	♦ Reflects trends in passenger transport. A distinction between private trips and business trips is not possible ♦ Reflects changes in modal split; data availability and quality needs improvement, is best for road traffic by passenger cars ♦ Reflects shifts towards less energy intensive means of transport (public transport); data not readily available
Passenger car stocks	
♦ Structure: – % equipped with catalytic converters – % of cars older than 10 years ♦ Ownership (number of passenger cars per capita)	♦ Reflects structural changes in the car fleet; relates to the energy efficiency of cars and to the level and composition of their exhaust emissions ♦ Data not readily available, new car registrations could be used as a proxy for renewal of car fleet ♦ Reflects changes in car ownership
Energy consumption by transport	
♦ Total trends and intensities, and by mode (road, rail, air) in toe and as % of total ♦ Consumption of road fuels: – total in litres per capita or litres per vehicle-km driven by passenger cars – by type of fuel (diesel, leaded gasoline, unleaded gasoline) as % of total	♦ Reflects the intensity and structure of the energy consumed by transport activities. A distinction between passenger and freight transport is not possible ♦ Road fuels: relates to the composition of exhaust emissions; to be complemented with information on fuel quality; a distinction between passenger cars and others is not possible
These indicators should be read in connection with indicators on electronic communication tools, socio-demographic structures (household size, age structure), land use patterns (urbanisation), total final energy consumption and fuel prices and taxes. One should keep in mind that the transport sector is defined in a functional way and covers all road transport activity regardless of the (institutional) economic sector to which it is contributing.	
Data sources: OECD Environmental Data, Compendium 1997; IEA Energy Statistics of OECD Countries 1995-1996; ECMT; IRF; UN-ECE; Eurostat; national transport yearbooks.	

POLICY RELEVANCE

Transport is both an economic sector in itself and a factor input to most other economic activities. It plays an important role in a country's environmental performance and the sustainability of its development. Transport has many effects on the environment; these depend on the transport mode, its energy efficiency and the rate of increase in related traffic volumes (passenger, freight).

The volume of traffic depends on the demand for transport (determined by economic activity and transport prices) and on transport supply (e.g. transport infrastructure). Transport trends are closely related to the increased time spent on leisure activities and to current patterns of urban sprawl which increase the dispersion of shopping, recreation and education services. They are also influenced by growth in income which has allowed people to travel more and given them more freedom to choose their mode of travel.

The socio-demographic development of OECD countries has encouraged the use of private cars for local and regional trips. This has led to, among others, increased congestion, accidents and related environmental problems. Air pollution raises concern mainly in urban areas where road traffic and congestion concentrate, though road transport also contributes to regional and global pollution such as acidification and climate change; transport infrastructure leads to fragmentation of natural habitats; and vehicles entail waste management issues. Concern about air traffic is rising, due to its rapid growth particularly for private and leisure trips.

Reductions in transport-related impacts depend on the choices of the providers and users of vehicles, infrastructure and transport services. Measures taken to influence individual travel decisions (e.g. fuel and road pricing, improved information provisions, and various land-use planning measures) have had little effect to date relative to the underlying growth in demand. Also, the benefit of technical measures to reduce vehicle emissions and noise has been outstripped by the increase in vehicle numbers, travel frequency and trip length.

TRANSPORT AND COMMUNICATION - COMMUNICATION

Proposed indicators	Comments
Communication tools	
♦ Circulation of daily and non-daily newspapers and periodicals (number and circulation by 1000 inhabitants)	♦ Possible overlap with paper consumption rates ♦ Needs further investigation on policy relevance
♦ Telephone lines, computers and/or Internet connections per 100 inhabitants	♦ Reflects potential for electronic communication and commerce ♦ Needs further investigation on policy relevance, and on actual implications for the environment
These indicators should be read in connection with indicators on physical transport for business and freight and on paper consumption.	
Data sources: Household surveys are the primary data source for figures on newspaper circulation. National statistical offices generally collect these data, but no international data sets exist at present. UNESCO (Statistical Yearbook, World Statistics Pocketbook) and Eurostat have some data. Data on Internet connections are available from MIDS.	

POLICY RELEVANCE

Information and education require paper and material devices such as radio, television and computers. Even though the production and use of the above devices contribute to energy and material consumption, and to the degradation of natural resources, modern information technologies (IT) could help to reduce the energy and material intensity of produced goods and to minimise the dependence of communication on transport and on paper use.

The increasing use of electronic commerce and communication as a substitute or complement to physical transport and communication (e.g. teleconferencing vs. business travel) may have implications for the environment and for sustainable development. Recent OECD studies show that IT have significantly changed the nature of the packaged consumer goods industry by helping to keep inventories low at all stages while offering a greater variety of the products consumers want when they want them. Their impacts on the environment may, however, be less positive, as plants may receive eight to ten deliveries a day rather than one and many trucks may arrive with less than a full load. More work is required to fully understand these linkages.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

Proposed indicators	Comments
♦ Household consumption expenditure by type of good	♦ Reflects the structure of consumption expenditure
♦ Ownership of selected commodities per household or per capita (e.g. radio, tv, video, refrigerator, washing-machine, dryer, micro-wave)	♦ Provides a proxy of electricity use by households, ♦ To be read in connection with information on changes in the energy efficiency of appliances ♦ Retail sales could be used as a proxy.
♦ Average length of product life, by selected product groups (to be further specified)	♦ Reflects the effects of optimising product design for durability. Not feasible in the short-run
♦ Paper consumption intensities (per capita, per unit of GDP) and related elasticities (% change in consumption/ % change in GDP over the same period)	♦ Per capita values reflect the level of education of a country's population; per unit of GDP values reflect the effect of higher income on paper consumption ♦ To be read in connection with i) paper recycling rates and ii) intensity of use of forest resources as a factor input for the production of wood and wood products (e.g. paper)
♦ Food consumption intensities and patterns: – by type of food (fish, meat, etc.) in kg per capita, as % of total – by growing method and level of process (share of processed food, share of organically grown produce over total agricultural produce consumed) as % of total	♦ Reflects a) consumer choices related to food categories and to growing methods, b) shifts in demand towards organically grown agricultural products ♦ To be read in connection with information on the environmental effects of the various growing and production methods (including effects on e.g. fish stocks) ♦ Needs further investigation on policy relevance, and on actual implications for the environment

These indicators should be read in connection with indicators on waste generation and disposal, on forest resource use and on agri-environmental issues. If available, they should further be related to the material or energy intensity of the goods produced.

Data sources: Commodities: National statistical offices (household surveys). No international data sets exist at present. UNESCO and Eurostat have some data. Other items: FAO (FAOSTAT database); OECD Environmental Data Compendium 1997; OECD National Accounts.

POLICY RELEVANCE

The production and consumption of goods and the associated material flows have numerous direct and indirect environmental effects throughout the product's life-cycle. These effects depend on the total material and/or energy intensity of the goods produced, and their expected life-time, as well as on the composition and level of pollutant and waste discharges.

The steady growth in the proportion of consumption expenditures allocated to durable goods in most OECD countries has led to a rapid growth in the stock of these goods (e.g. radio, tv, video, refrigerator, washing-machine, dryer, micro-wave). This is further reinforced by some of the socio-demographic changes such as the trends towards smaller households combined with the ageing process. The impact of this development can be seen in the increased disposal rates of goods and hence the growing amounts of waste.

The paper production and consumption chain illustrates the importance of life-cycle analysis: environmental and sustainability issues arise at each stage of the chain. Most environmental impacts originate, however, in the production and use stage, not in the final consumption. In the production stage, concerns relate to the use of forest resources, to emissions of GHG and dioxins and to water pollution. At the consumption end of the chain, main concerns relate to waste generation and disposal. Most paper is used as an input in other sectors: packaging now outweighs communications as the single largest use[23]. Individual consumers directly use only a small fraction of paper products in the form of personal case products, diapers, etc.

Food consumption patterns contribute indirectly to problems such as acidification, climate change, waste generation, energy use, land conversion, soil erosion, pesticide and fertiliser use. These effects are influenced by various consumer choices related to food categories (meat, dairy products, etc.), packaging, growing method (organic, intensively grown produce, etc.), food state (frozen, tinned, fresh, pre-prepared), and source of food and seasonality. The increased use of highly processed prepared food, for example, is related to the increased proportion of containers and packaging in household waste. This has meant an increase in metals, plastics and other synthetic materials in household waste that require appropriate collection, recycling and disposal methods.

23. Robins N. and S. Roberts. 1996. Rethinking Paper Consumption, IIED Discussion Paper. International Institution for Environment and Development.

RECREATION AND TOURISM

Proposed indicators	Comments
♦ Trends in international tourism: – international tourist receipts in real terms	♦ Reflects the importance and growth of the tourist sector, can be used as a proxy for the impact of foreign tourists on a country; can be related to GDP ♦ Could be complemented with data on nights spent in hotels, passenger arrivals and departures at airports
♦ Household consumption expenditure on recreation	♦ Already covered under "economic trends", private final consumption expenditure by purpose
♦ Leisure travel as percentage of total passenger-km	♦ Gives an indication of the importance of leisure travel ♦ Problems with data availability
♦ Access to green areas in cities (% of population living within 15 minutes of a green area)	♦ Indicator included in the UN Compendium of Human Settlement statistics. Policy relevance needs to be further specified

These indicators should be read in connection with indicators on the seasonal variations of population density in sensitive areas (e.g. coastal areas, mountains), on seasonal variations of effluent discharges in the same areas and on the share of built-up land in these areas. To be complemented with indicators on land used for recreation and on the protection levels of particularly sensitive areas in tourist receiving regions.

Data sources: National statistical offices generally collect some of these data and there are some international data sets, such as the ones published in OECD Tourism Statistics. Additional data sources need to be found.

POLICY RELEVANCE

Tourism is an important economic activity in the OECD area with many positive impacts on, e.g., employment in less-developed regions. It forms a complex in which economic, socio-cultural and environmental aspects interrelate in a number of ways. Tourism activities are, to a large extent, carried out by the private sector and market incentives have contributed to its growth.

During the last three decades, time-use patterns have been marked by a rapid increase in leisure and tourism activities. Tourism has thus become not only the world's largest industry, but also one of the fastest growing economic sectors.

These developments have been partly beneficial to the environment: since a high-quality environment is an essential prerequisite for tourism, this has stimulated improved protection of the natural environment, landscapes and historic sites in a number of OECD countries. But pressures have also increased due to the seasonal nature and geographical concentration of mass tourism (air and water pollution, environmental restructuring due to second homes and tourism-related buildings and infrastructures). Negative impacts on the environment involve a high energy consumption and the degradation of natural resources such as water, soil, landscape and habitat. In addition to the environmental problems associated with travel to the recreation site or holiday destination, many environmental costs are incurred in the need to lay utility services, provide additional infrastructure and organise waste disposal. These pressures are often concentrated in environmentally-sensitive areas such as lakes, seashores and mountains. The degree of environmental damage caused to these areas by tourism depends to a large extent on the carrying capacity of the resort.

The impact of tourism on physical resources and the environment is substantial and is expected to increase. The tourism industry's capacity to integrate environmental concerns into their strategies is thus an important element of sustainable development. As early as 1979, the OECD Council adopted a Recommendation on Environment and Tourism to better integrate environmental considerations into Member countries' tourism policies and to ask countries to develop a set of relevant indicators to support public authorities in this task.

HOUSING RELATED ENERGY AND WATER USE – ENERGY

Proposed indicators	Comments
♦ Total final energy consumption (TFC)	
– intensity (toe per capita) and structure by type of final use (as % of total)	♦ Reflects the contribution of residential energy use to TFC
– share of consumption of renewable energy resources (as % of total)	♦ May be used to assess fulfilment of policy targets requiring a specific percentage of energy supply from renewable resources
♦ Residential energy consumption – intensity (toe per household or per capita) – structure by type of energy, electricity, natural gas, other (as % of total)	♦ Reflects trends in the level and structure of residential energy use ♦ Relates to the energy efficiency of appliances and heating systems
These indicators should be read in connection with other energy-related indicators, as well as with indicators on energy prices and taxes, consumption of durable goods (e.g. electric appliances), transport, consumption expenditure for heating purposes and related environmental impacts (e.g. air emissions).	
Data sources: IEA Energy Balances of OECD Countries, annual publication; OECD Environmental Data Compendium 1997; OECD Environmental Indicators 1998.	

POLICY RELEVANCE

Energy is a major component of OECD economies, both as a sector in itself and as a factor input to all other economic activities. The structure of a country's energy supply and the intensity of its energy use, along with changes over time, are key determinants of environmental performance and sustainability of economic development. The supply structure varies considerably among countries. It is influenced by demand from industry, transport and households, by national energy policies and by national and international energy prices.

Energy plays an essential role in the everyday life of citizens, heating their houses and supplying power for most domestic services (household appliances and other electrical goods), as well as providing them with the capacity to travel to their workplace/business and/or holiday/recreation activities. The socio-demographic developments over the past decades have contributed to increasing consumption of energy through growth in the stock of durable goods. This entails the risk of cancelling out the favourable effects of increased energy efficiency of appliances and cleaner technologies on the environment.

Energy consumption has direct and indirect environmental effects that differ greatly by primary energy source. Fuel combustion is the main source of local and regional air pollution and GHG emissions[24]; other effects involve water quality, land use, risks related to the nuclear fuel cycle and risks related to the extraction, transport and use of fossil fuels. The consequences of these effects on the environment further depend on the technologies adopted and on the policies implemented to control pollution and risks.

Pollutants such as CO_2 and SOx vary directly with the amount of energy consumed, while emissions of NOx, CO and VOC are also technology dependent. As a result, the overall improvement in pollution levels from reduced energy consumption is not necessarily directly proportional to the reduction in energy use. One should also keep in mind that some measures to reduce household fuel consumption have transferred pollution problems (e.g. insulation of buildings impairing indoor air quality). Other things being equal (mix of energy sources, technology, etc.), reduced total energy use can generally be expected to alleviate environmental pressures at all stages of the fuel cycle.

24. United Nations. 1997. Critical Trends – Global Change and Sustainable Development, Department for Policy Co-ordination and Sustainable Development, New York.

HOUSING RELATED ENERGY AND WATER USE – WATER

Proposed indicators	Comments
♦ Household water consumption – consumption intensities (litres per capita per day)	♦ Reflects the contribution of households to freshwater consumption; may help to identify potential for water saving ♦ Water abstractions for public supply can be used as a proxy
– consumption structure by type of use (bathing and showering, washing machine, dish-washing, toilet flushing, drinking and cooking, external use, miscellaneous)	Not feasible in the short-term

These indicators should be read in connection with indicators on water abstractions and related intensities, as well as with indicators on water prices and charges, and on related PAC expenditure.

Data sources: OECD Environmental Data Compendium 1997; OECD Environmental Indicators 1998.

POLICY RELEVANCE

Water plays an essential role in the everyday life of citizens for drinking purposes, cooking, washing, cleaning, etc. Even if the use of water for irrigation and industrial production is the major constituent of the demand for fresh water, water use by the domestic sector is increasing in both developed and developing countries. In the last 50 years, the demand for freshwater has increased over four-fold in the world, whereas the world population has roughly doubled over the same period.

When consumers do not pay the full cost of water, they tend to use it inefficiently. This can result in serious problems, such as low river flows, water shortages, salinisation of freshwater bodies in coastal areas, human health problems, loss of wetlands, desertification and reduced food production.

The efficiency of water use is a key issue to meet the increasing demand for water resources in a sustainable perspective. Reducing losses, using more efficient technologies and recycling are all part of the solution, but applying the user pays principle to all types of users, including households, is an essential element of sustainable management.

INDICATOR SHEETS - INTERACTIONS BETWEEN CONSUMPTION AND THE ENVIRONMENT

Consumption by households and government is a determinant of sustainable development, and its economic, environmental and social dimensions. It has important implications for the level and pattern of production and for related demands for natural resources. Growth of private consumption has both positive and negative environmental effects. It entails increased use of private transport, more leisure and tourism, higher consumption of resources including energy and land, increased use of packaged goods and higher waste production.

This section looks at the interactions between consumption and the environment. Interactions between consumption patterns and the environment cover direct pressures on the environment and on natural resources as well as resulting environmental impacts and conditions. The proposed indicators relate to:

- *consumption-induced resource abstractions such as water abstractions for public supply;*
- *consumption-induced pollutant and waste discharges into air and water;*
- *related effects on environmental conditions, such as human exposure to air pollution in heavy traffic areas, exposure to noise from various sources, etc.*

The indicators are structured by media and/or environmental issue. The list of issues covered here is not exhaustive. Focus is given to those issues which closely relate to major consumption trends and patterns described in the previous section. Focus is given to air, water, waste and land. Other important issues such as wildlife, biodiversity, and forest are only partially covered at this stage and need to be further developed. Also, indicators on the environmental implication of tourism need to be given more consideration.

The indicators should give an overview of the state of the environment and its development over time. In practice, it is often difficult to distinguish between pressure and state indicators in this context. Therefore, measurement of trends reflecting both indirect and direct pressures (i.e. driving forces and related resource use and pollution generation) is often used as a substitute for measuring the impact on the environment.

AIR

Proposed indicators	Comments
♦ Air emissions from residential energy use (as a share of total emissions in %, and related intensities in kg per capita and per GDP) – emissions of CO_2 and other GHG in GWPs – emissions of SOx, NOx and VOC	♦ Reflects the contribution of housing activities to national emissions from residential fuel combustion ♦ Does not reflect indirect emissions from residential electricity use ♦ Helps to identify the potential role of households in reducing emissions or emissions' growth rates in the framework of international conventions
♦ Air emissions from passenger transport (as a share of total emissions, and related intensities in kg per capita or per passenger-km and per vehicle-km) – emissions of CO_2, NOx, CO and VOC from mobile sources (road, air, rail, ships, etc.) – emissions of CO_2, NOx, CO and VOC from road transport	♦ Reflects the contribution of private transport to national emissions and helps to identify the potential role of households in reducing emissions or emissions' growth rates in the framework of international conventions ♦ A distinction between private and other transport is not possible. Data availability is best for road transport

These indicators should be read in connection with indicators on transport, on energy consumption and on pollution and abatement control expenditure. They should further be complemented with indicators on air quality in cities and on related population exposure.

Data sources: OECD Environmental Data Compendium; OECD Environmental Indicators.

POLICY RELEVANCE

Atmospheric pollutants from energy transformation and energy consumption are major contributors to regional and local air pollution. Consumption induced air emissions originate i) directly from private transport and other energy-dependent activities mostly linked to housing (e.g. heating, use of electric appliances), and ii) indirectly from activities linked to the production and intermediate consumption of goods. They include emissions of CO_2, CO, NOx, particulates and VOC emitted directly by fuel combustion. Major concerns relate to the resulting global, regional and local pollution. Main impacts concern climate change, acidification, urban air quality and related population exposure, and their effects on human health and ecosystems. Human exposure is particularly high in urban areas where economic activities are concentrated. Air pollution may damage ecosystems, buildings and monuments, for example through acid precipitation and deposition.

Degraded air quality can result from and cause unsustainable development patterns. It can have substantial economic and social consequences, from medical costs and building restoration needs to reduced agricultural output, forest damage and a generally lower quality of life.

The structure of energy consumption by road transport and the related fuel quality determine the composition of exhaust emissions and hence their impacts on the environment and on human health. Changes in fuel quality and the use of unleaded gasoline accompany the introduction of vehicles equipped with three-way catalytic converters.

In Europe and North America, regional air pollution has led to several international agreements. For example, under the Convention on Long-Range Transboundary Air Pollution (Geneva, 1979), protocols to reduce emissions of sulphur (Helsinki, 1985 and Oslo, 1994), nitrogen (Sofia, 1988) and VOCs (Geneva, 1991) have been adopted.

At global level, concern about climate change led to the United Nations Framework Convention on Climate Change (FCCC) (Rio de Janeiro, 1992) which aims at stabilising GHG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

WASTE

Proposed indicators	Comments
♦ Generation of household waste: – total and intensity per capita and per unit of PCFE – composition by type of material in % (paper, textiles, food & garden waste, plastics, glass, metals, etc.)	♦ Reflects the waste generation intensity of household consumption activities; indirectly reflects the results of waste minimisation policies ♦ Reflects the impact of changing consumption patterns on waste production ♦ A distinction between household and other municipal waste is not always possible. Surveying methods vary among countries
♦ Waste recycling rates (paper, glass, batteries, PVC bottles, metals, other waste streams)	♦ A distinction between household and other waste is not always possible ♦ Can be used for measuring fulfilment of targets requiring specific percentages of recycled products ♦ Could be complemented with indicators on material re-use, e.g. percentage of return retrieved through deposit refund systems (bottles, cans, batteries and large household goods) to measure the effectiveness of deposit refund systems
These indicators should be read in connection with indicators on the consumption of durable and non-durable goods, on waste management expenditure. To be complemented with information on eco-labelling and on consumer behaviour.	
Data sources: OECD Environmental Data Compendium; OECD Environmental Indicators.	

POLICY RELEVANCE

Waste is generated at all stages of human activities. Its composition and amounts depend largely on consumption and production patterns. Waste imposes a potential impact on human health and on the environment (soil, water, air and landscape). The actual impact depends, however, on the waste handling and disposal practices, and is influenced by the waste composition and origin.

The socio-demographic developments in a number of OECD countries, such as the trend towards smaller households and the ageing process, have reinforced the growth in consumption of durable and semi-durable goods, thus increasing the rate at which goods are disposed. The quantity of household waste produced has thus been steadily increasing over the past decades.

Waste management issues are at the centre of environmental concerns in many countries. Responses have been directed mainly towards collection, treatment and disposal. Increasingly, efforts are aimed at waste minimisation, which has become a goal of environmental policies and of sustainable development strategies. It can be achieved through waste prevention, recycling and recovery, and more broadly through better integration of environmental concerns in consumption and production patterns.

Environmental performance is related to the level and pattern of consumption (e.g. behaviour with respect to recycling, adaptation of product design to consumer demands, consumer information such as labelling) and can be measured with respect to minimisation goals and through waste generation intensities of consumption patterns.

At international level, several agreements and rules exist for waste in general and for transfrontier movements of hazardous waste in particular: Directives of the European Community, OECD Decisions and Recommendations, the Lomé IV Convention and the 1989 Basel Convention. Management of solid waste and sewage is an explicit item in Agenda 21, endorsed by the UNCED (Rio de Janeiro, 1992).

WATER

Proposed indicators	Comments
♦ Water abstractions for public supply: intensity per capita and as % of total abstractions	♦ Reflects the contribution of the domestic sector to overall water abstractions and to related stress on water resources
♦ Waste water discharges by households (possible units: inh. eq., cubic metres, BOD) – annual discharges, national total – seasonal discharges, sensitive areas (e.g. coastal zones)	♦ Reflects the pressure from domestic sources on the quality of freshwater resources. Seasonal variations reflect the pressures due to tourism and leisure activities ♦ Data availability is low. International data on seasonal variations do not exist
♦ Population connected to waste water treatment plants	♦ Reflects the level of treatment of domestic waste water by public services

These indicators should be read in connection with indicators on household water consumption, on water prices and charges, and on related PAC expenditure.

Data sources: OECD Environmental Data Compendium 1997; OECD Environmental Indicators 1998. Estimation methods vary among countries and over time.

POLICY RELEVANCE

Freshwater resources are of major environmental, social and economic importance. Their distribution varies widely among and within countries. Pressures on water resources are exerted by overexploitation (abstractions) as well as by pollution loads from human activities (agriculture, industry, households), and by climate and weather. If pressure from human production and consumption activities becomes so intense that water quality is impaired to the point that drinking water requires ever more advanced and costly treatment or that aquatic plant and animal species in rivers and lakes are greatly reduced, then the sustainability of water resource use is in question.

Depending on countries' climatic conditions, the structure of their economies and their water supply systems, water abstractions for public supply account for about 10-60 per cent of total abstractions.

The efficiency of water use is key in matching supply and demand. Reducing losses, using more efficient technologies and recycling are all part of the solution, but applying the user pays principle to all types of users is an essential element of sustainable management. Agenda 21, adopted at UNCED (Rio de Janeiro, 1992), explicitly considers items such as the protection and preservation of freshwater resources. Water management is the focus of UNCSD's work in 1998.

Domestic discharges of waste water contribute to the pressure put on the quality of freshwater resources. OECD countries have progressed with basic domestic water pollution abatement, but the level of treatment varies significantly among OECD countries: secondary and tertiary treatment has progressed in some while primary treatment remains important in others. Some countries have reached the economic limit in terms of sewerage connection and must find other ways of serving small, isolated settlements.

Countries are increasingly recognising the need for an integrated water cycle management considering both the production and demand side. Achieving more efficient and ecologically sustainable water consumption patterns depends on significant changes in the pricing allocation and management of water supplies. Possible measures include:

- establishing full-cost water pricing regimes;
- development of more appropriate institutional structures, functions and responsibilities;
- strengthening the information base on water supply, and current and projected demand;
- greater involvement and responsibility of water users in water policy development and implementation; and
- promoting a faster and wider diffusion of water-efficient technologies and practices.

Water management measures also include land use planning which should integrate physical, social and economic planning. All these measures are, however, difficult to quantify and no reliable data are at present available.

NOISE

Proposed indicators	Comments
♦ National population exposed to noise levels from various sources (air, road and rail traffic, neighbourhood noise). Noise levels to be considered: Leq < 55 dB(A), Leq < 65 dB(A), Leq > 65 dB(A) -	♦ Data availability is best for exposure to road traffic noise, but still lacks international comparability and completeness due to varying estimation methods
These indicators should be read in connection with indicators on transport and on ownership of selected household appliances.	
Data source: OECD [Environmental Data Compendium 1993].	

POLICY RELEVANCE

Noise is often considered to be a major local environmental problem, sometimes even more important than air pollution and quality of drinking water. Noise originates from many sources ranging from transport (air, road, rail) and industry to neighbourhood activities.

Transport noise, particularly from roads, is the major source of external acoustic energy in urban areas and the principal cause of the perception of noise as a nuisance. But changing lifestyles and patterns of consumption are resulting in other, more limited, sources of noise that have a more localised impact and are less easy to pinpoint and control. These include: expansion of audio-visual media, leisure activities, tourism and public entertainment; growth in recreational “toys” such as trail bikes, snowmobiles, ultra-light aircraft; use of motorised vehicles and crafts in formerly unspoilt areas, growth of air travel and helicopter flights, extensive use of hi-fi and other acoustic systems. Neighbourhood noise (from hi-fi equipment, household appliances, lifts and other equipment in apartment buildings) is an increasing problem because of inadequate policies in this area.

Many people in OECD countries feel that noise reduces their quality of life and downgrades their surroundings. Noise can also affect human health and interfere with communication and behaviour. Disruption and damage caused by noise include: annoyance, disturbed sleep, auditory and non-auditory impairment, stress, impact on inter-personal relations. Numerous research projects undertaken in OECD countries on the effects of noise and on its wider repercussions have found that an outdoor level of 65 dB(A) (Leq for daytime period) is "unacceptable" and an outdoor level of less than 55 dB(A) is desirable. The majority of OECD countries during the 1980s applied standards concerning the noise of vehicles and planes.

Damage caused by noise has economic implications, not only in terms of the direct cost of noise abatement policies, but also to the extent that products and goods marketed internationally are required to comply with noise regulations.

LAND AND BIODIVERSITY

Proposed indicators	Comments
♦ Use of land resources and of space	Can be related to wildlife, habitats and ecosystem issues
– urbanisation: land covered by urban development in km^2 and as % of total land area	♦ Describes the effects of urbanisation on the use of land ♦ Data availability and comparability need improvement
– land use patterns and conversions in sensitive areas (coastal areas, mountains, etc.) – land used for recreation over total land area	♦ Focus could be given to tourist receiving areas ♦ Reflects the impact of tourism & related infrastructures on the consumption of land & space ♦ Problems with data availability
♦ Protected areas (including protected forest areas and protected landscapes)	Partly reflects the demand for a high quality environment resulting from increased leisure and tourism activities. Needs further specification and analysis.
These indicators should be read in connection with indicators on socio-demographic changes, on transport and on tourism.	
Data sources: OECD Environmental Data Compendium 1997, IUCN, FAO, Corine Landcover	

POLICY RELEVANCE

Land is a factor input to most human or natural activities that need space to locate and to develop. Land resources are used for production activities (mining, manufacturing, agriculture, forestry, fisheries, etc.), transport (infrastructures) and human settlements, as well as for leisure and tourism activities (camping, hiking, skiing, hotels, etc.), and for ecosystem development and wildlife. Land is therefore an environmental resource (asset) that has to be shared among these activities, and conflicts may arise among them. Land is also affected by impacts from other pollution (air, water, waste).

Consumption levels and patterns have many interacting effects on environmental resources (assets) mainly due to urban sprawl, demand for food, growth in tourism and leisure activities and related transport trends. The spatial extension of larger cities conflicts with other land uses and puts additional stress on ecosystems outside these areas. Changes in land use and degradation of soil resources have many implications for natural habitats and ecosystems and hence for biodiversity. When linked to tourism these pressures often concentrate in environmentally sensitive areas, and coastal zones, shore areas and mountains suffer most of the consequences. The degree of environmental damage caused to these areas by tourism, however, depends to a large extent on the carrying capacity of the resort.

Since a high-quality environment is an essential prerequisite for tourism, this stimulates improved protection of the natural environment, landscapes and historic sites in a number of OECD countries. There are a number of environmental assets that should be preserved despite their potential tourist exploitation; these include valuable landscapes and ecosystems, unique sites, and monuments. Areas of a particularly sensitive nature require special protection to limit or close them entirely to visitors. Other areas presenting a delicate equilibrium between nature, agricultural activities and tourism (e.g. mountain regions and alpine areas) require special attention.

The development of meaningful land use indicators is a complex issue, because at national level these aggregated indicators generally have very little meaning. It appears that at the level of relatively homogeneous ecological zones or local level, the work is more promising. Quantifying the environmental effects of land use changes is a difficult task however, and taking action to improve natural resource management is hampered by a shortage of reliable, easily accessible information on the nature and extent of land degradation problems and their productivity impacts.

No attempt is made here to develop indicators that relate consumption levels and patterns to biodiversity issues.

INDICATOR SHEETS - ECONOMIC AND POLICY ASPECTS

The management of consumption and leisure activities is a challenge for environmental and economic policies. Environmental impacts originating from consumption and leisure activities are more widely dispersed than those from stationary sources; they will be more difficult to manage and control. In some cases, socio-demographic developments can cancel out the benefits of technological achievements. The effectiveness of measures like economic incentives may be limited because of the many non-economic functions which consumption and leisure serve.

Government actions at local, national and international levels are critical for steering demand patterns, and thereby supply, towards sustainability. A challenge for governments is to achieve real synergies in the combination of different types of instruments to change demand.

Governments have a central role in correcting market failures by introducing regulations, economic and social instruments. But they also need to review their economic and sectoral policies to ensure that subsidies do not support unsustainable consumption and production patterns. As major consumers, governments can help shape market conditions by applying environmental criteria and goals to their procurement, service provision and administrative activities.

Given the broad scope of government action, it is important for both the effectiveness and credibility of policy measures on sustainable consumption that all public policies are mutually consistent and coherent with the wider goals of sustainable development. National governments have a range of important responsibilities, including setting the analytical and policy framework for sustainable consumption (including dynamic market conditions), establishing effective incentives, infrastructure and information that enable consumers to take sustainable consumption choices, taking the lead through public procurement policies, and using indicators to measure progress.

Economic and policy aspects cover key policy and other societal responses, as well as trade aspects. The proposed indicators relate to:

- *regulatory instruments (indicators to be further developed);*
- *economic instruments including public sector and household expenditure on pollution abatement and control, prices and taxes for energy and water, tax rates on resource use, subsidies for transport, devices and technologies that promote a more efficient use of resources;*
- *information/social instruments including consumer attitudes, eco-labelling, public expenditure on environmental information and education;*
- *trade aspects such as the composition of internationally traded goods (raw materials, manufactured goods, services, etc.) or the ratio between imported and domestically produced goods.*

REGULATORY INSTRUMENTS

Proposed indicators	Comments
♦ No indicators are proposed at this stage	♦ Needs further investigation

POLICY RELEVANCE

Regulatory instruments may be used in some cases to drect consumers towards more environmentally friendly behaviour; in other cases they may be used to encourage eco-efficient production patterns and product policies. They include, for example, standards on minimum recycled content and energy efficiency, bans and restrictions on materials, products and disposal, standards on road vehicle exhaust emissions, etc.

Meaningful quantitative indicators on regulatory measures are difficult to define, thus no indicators are presented here at this stage. In most OECD work, regulatory aspects are covered through appropriate policy description and analysis rather than through quantitative indicators.

ECONOMIC INSTRUMENTS

Proposed indicators	Comments
♦ Consumer price index	♦ Indicates trends in the level of consumer prices
♦ PAC expenditure by the public sector and by households: total, by type of expenditure, by environmental domain	♦ Could be complemented with PAC expenditure on water and waste in tourist receiving regions ♦ Data availability and quality need improvement
♦ Energy prices and taxes (end-use prices in US$ per unit of energy, taxes as a % of the end-use price): – prices & taxes for households (oil, gas, electricity) – road fuel prices & taxes (diesel, leaded, unleaded gasoline)	♦ Indicates to what extent external costs are internalised ♦ Prices and taxes for industry for the same types of energy can be given as a complement
♦ Prices for public water supply ♦ Charges for waste water treatment	♦ Data availability permitting, this indicator should be related to the actual total cost for sewage treatment and water supply
♦ Subsidies for transport, efficient building technologies and practices, and water/energy saving devices (e.g. energy-efficient windows, insulation, fluorescent lamps)	♦ Approximation of the extent to which efficiency improvements are encouraged ♦ No data available in the short term
♦ Tax rates on natural resource use compared to tax rates on services	♦ Policy relevance needs further investigation

These indicators should be read in connection with indicators on household consumption, on transport and on housing related energy and water use.

Data sources: OECD Environmental Data Compendium 1997; OECD Environmental Indicators, 1998; IEA Energy Prices and Taxes.

POLICY RELEVANCE

Economic instruments (charges, fees, taxes, subsidies, expenditure) are generally regarded as the most important instruments to promote internalisation of measurable externalities. Economic incentives through environmentally-sound pricing and taxation policies, for instance, can be used in two ways: to prevent general increases in income from being transformed into environmentally harmful consumption patterns, and to support people's willingness to adopt new ways of life. With the right incentives, changes in consumption patterns can involve orders of magnitude increases in the productivity of energy and material resources, reduced/eliminated use of toxics and creation of loop-closing systems. Government investments and procurement policies can be used to stimulate and support environmentally friendly technologies and products and to provide appropriate PAC equipment.

Prices play a major role as an instrument of information and are important determinants of consumer behaviour and of related environmental impacts.

In the case of energy, price signals help to achieve an efficient allocation of energy resources. Fuel prices which rise relative to other goods tend to reduce demand for fuels, stimulate energy saving and may influence the fuel structure of energy consumption. Governments exert a major influence on the level of energy prices through measures of taxation. Fuel taxation has been developed primarily to raise revenue and to reduce energy dependency. However, the use of fiscal instruments to internalise environmental costs and to influence energy consumer behaviour is increasingly considered by Member countries. This is reflected in the introduction of tax differentials in favour of unleaded gasoline in many Member countries and the implementation of environmental taxes on energy products in some Member countries.

In the case of water, policies for pricing water supply and waste water treatment are important in matching supply and demand and improving the cost-effectiveness of water services. Cost internalisation can be an effective tool to achieve water use efficiencies. Prices charged to domestic and industrial users sometimes include an abstraction tax and increasingly cover full investment and operating costs. The cost of delivering clean water to urban areas depends, inter alia, on the proximity of water sources, the degree of purification needed and the settlement density of the area served. In many countries the price of water is either subsidised or fixed below its real cost. This situation encourages the inefficient use of water.

INFORMATION/SOCIAL INSTRUMENTS

Proposed indicators	Comments
♦ Consumer attitudes towards environment	♦ Reflects changes in the opinion of consumers and helps to identify the potential for changing consumer behaviour
♦ Eco-labelled products: share of purchase of eco-labelled products/total consumption purchase (%)	♦ Indicator for the order of magnitude of the consumption of environmentally preferable products. Data not readily available
♦ Public expenditure on environmental information and education	♦ Reflects the public sector's willingness to inform the public about the implications of their choices as consumers ♦ Data not readily available
♦ Public support to green NGOs	♦ Data not readily available

These indicators should be read in connection with indicators on socio-demographic changes and on the consumption of durable and non-durable goods.

Data sources: Most data needed to measure the proposed indicators are not readily available in the short term. Some data exist on consumer attitudes (public opinion surveys, consumer surveys) at national and at European Union level. Data on public expenditure on environmental information and education exist in some (a few) countries, but are not readily available at international level.

POLICY RELEVANCE

Information/social instruments aim at providing consumers with information on the consequences of their consumption choices and behaviour, so as to encourage demand for, and use of, environmentally sound products. They include information and public awareness instruments, which are designed to change structural consumer preferences over time (e.g. eco-labelling, product hazard warnings, advertising campaigns, environmental education), and participation/communication instruments, such as public participation in policy development. The latter are applicable in circumstances in which choices for action have to be formulated on the basis of preferences revealed through discussion, consultation, participation and other mechanisms of social choice. In these cases, governments are the organisers of institutional processes in which stakeholders define priorities for action without any pre-defined qualitative or quantitative objectives. They also include other public activities such as promotion of local innovation and experimentation by the central government.

Consumer information is closely linked to product policies which tend to reduce negative environmental effects through extending the product's life time and optimising product design for durability, reuse and recycling; encouraging the production and consumption of environmentally preferable products; and shifting from buying products to buying services.

TRADE ASPECTS

Proposed indicators	Comments
♦ Composition of internationally traded goods (manufactured goods, services, etc.) ♦ Ratio between imported and domestically produced goods in domestic consumption	♦ Policy relevance and definitions need to be further specified

Data sources: to be further explored.

POLICY RELEVANCE

Globalisation, trade and consumption patterns in OECD countries interact in two different directions: first, increasing globalisation influences consumption patterns through the availability of new products and relative price changes; second, consumption patterns in OECD countries can in themselves exert influences on global trade flows. The two effects define demand and supply on the global market and together influence economic and environmental outcomes.

Global trade, by definition, implies a geographical separation of consumption and production. This raises new questions concerning their separability in policy terms. Globalisation also accelerates technological change and the exchange of information.

ANNEX 2
MEASURED INDICATORS - TECHNICAL ANNEX

GENERAL INFORMATION

Country region codes used are as follows:

CAN:	Canada	FIN:	Finland	NOR:	Norway
MEX:	Mexico	FRA:	France	POL:	Poland
USA:	United States	DEU:	Germany	PRT:	Portugal
JPN:	Japan	wDEU:	western Germany	ESP:	Spain
KOR:	Korea	GRC:	Greece	SWE:	Sweden
AUS:	Australia	HUN:	Hungary	CHE:	Switzerland
NZL:	New Zealand	ISL:	Iceland	TUR:	Turkey
AUT:	Austria	IRL:	Ireland	UKD:	United Kingdom
BEL:	Belgium	ITA:	Italy	TOT:	regional totals
CZE:	Czech Republic	LUX:	Luxembourg		
DNK:	Denmark	NLD:	Netherlands		

*: Data including western Germany only

➢ Country aggregates

OECD: All OECD Member countries, which include the OECD Europe — i.e. countries of the European Union (EU) plus Czech Republic, Hungary, Iceland, Norway, Poland, Switzerland and Turkey — plus Canada, Mexico, the United States, Japan, Korea, Australia and New Zealand.

*OECD All OECD Member countries except eastern Germany.

**OECD Partial OECD total.

➢ Signs

..; n.a.	not available	.	decimal point	%	percentage
-	nil or negligible	n. app.	not applicable	$	US dollar

ECONOMIC TRENDS

CONSUMPTION EXPENDITURE SHARES OF GDP - PER CAPITA EXPENDITURE - GOVERNMENT CONSUMPTION EXPENDITURE

Data sources: OECD.

- Gross Domestic Product: the total of the gross expenditure on the final uses of the domestic supply of goods and services valued at purchasers' values less imports of goods and services valued c.i.f.; expressed at 1991 price levels and purchasing power parities.
- Private final consumption expenditure: the sum of (i) the outlays of resident households on new durable and non-durable goods and services less their net sales of second-hand goods, scraps and wastes; (ii) the value of goods and services produced by private non-profit institutions for own use on current account; expressed at 1991 price levels and purchasing power parities.
- Government final consumption expenditure: the value of goods and services produced by governments for their own use on current account; expressed at 1991 price levels and purchasing power parities.
- Gross fixed capital formation: the outlays of industries, producers of government services and producers of private non-profit services to households, on additions of new durable goods to their stocks of fixed assets less their net sales of similar second-hand and scrapped goods; expressed at 1991 price levels and purchasing power parities.

DEU ➢ 1970 and 1980 data and changes refer to western Germany only.
TOT ➢ Includes western Germany only; excludes Czech Republic, Hungary and Poland.

NET SAVING PER CAPITA

Data sources: OECD.

- Saving: the difference between the current receipts and the current disbursements; the balancing item on the income and outlay account; expressed in US$ per capita at 1991 price levels and purchasing power parities.

CZE ➢ 1996 data refer to 1994.
IRL ➢ General government and Corporate and quasi-corporate enterprises: 1996 data refer to 1995.
PRT ➢ General government, Corporate and quasi-corporate enterprises and Households and private unincorporated enterprises: 1996 data refer to 1995.

HOUSEHOLD CONSUMPTION EXPENDITURE

Data sources: OECD.

- Per capita: data refer to private final consumption expenditure for 1998.
- Structure by type: data refer to final consumption expenditure in the domestic market by households; data refer to 1996 or latest available year.

CZE ➢ 1996 data refer to 1994.
DNK ➢ 1996 data refer to 1995.
GRC ➢ 1996 data refer to 1995.
PRT ➢ 1996 data refer to 1995.

CONSUMER PRICES INDEX

Data sources: OECD.

- All items: OECD total is greatly influenced by high inflation countries. Total excludes Czech Republic, Hungary, Korea.
- Food: Generally includes restaurant meals and excludes beverages and tobacco.
- Energy: includes Fuel and Electricity and, where available, Gasoline; aggregates exclude Greece, Island, Mexico, Portugal, Sweden and Turkey.

USA ➢ Urban population.
AUS ➢ Urban population; households of wage and salary earners.
BEL ➢ Households of wage and salary earners.
DEU ➢ From 1991, data refer to unified Germany and are expressed in base 1990=100 using 1990 annual average data for Western Germany.
GRC ➢ Urban population.
ISL ➢ Urban population.
ITA ➢ Households of wage and salary earners; excluding tobacco.
LUX ➢ Households of wage and salary earners.
PRT ➢ Data include rent from 1991 and are expressed in base 1990=100 using 1990 annual average data for all items less rent.
TUR ➢ Urban population.

SOCIO-DEMOGRAPHIC CHANGES

POPULATION STRUCTURE AND DENSITY

Data sources: OECD Labour Force Statistics, FAO

- Population: all nationals present in or temporarily absent from a country, and aliens permanently settled in the country.
- Urban population is based on varying national definitions of urban areas, which can be roughly divided into three major groups: classification of localities of a certain size as urban; classification of administrative centres of minor civil divisions as urban; and classification of centres of minor civil divisions on a chosen criterion which may include type of local government, number of inhabitants or proportion of population engaged in agriculture.

BEL ➢ 1997 data refer to 1996. Urban population: includes Luxembourg.
GRC ➢ 1997 data refer to 1996.
ISL ➢ 1997 data refer to 1996.
LUX ➢ 1997 data refer to 1996.
NLD ➢ 1997 data refer to 1996.
PRT ➢ Urban population: national data.
TOT ➢ Excludes Korea, Czech Republic and Hungary.

TRANSPORT AND COMMUNICATION

ROAD TRAFFIC AND VEHICLE INTENSITIES

Data sources: OECD, European Conference of Ministers of Transport (ECMT), International Road Federation (IRF), American Automobile Manufacturers' Association, national yearbooks.

- Traffic volumes are expressed in billions of kilometres travelled by road vehicle; they are usually estimates and represent the average annual distance covered by vehicles, in kilometres, multiplied by the number of vehicles in operation. In principle, the data refer to the whole distance travelled on the whole network inside the national boundaries by national vehicles, with exception of two- and three-wheeled vehicles, caravans, and trailers.
- Network length refer to motorways, main or national highways, secondary or regional roads, and others. In principle, the data refer to all public roads, streets and paths in urban and rural areas, but not private roads.
- Total stock of motor vehicles includes passenger cars, goods vehicles, buses and coaches. Data refer to autonomous road vehicles with four or more wheels, excluding caravans and trailers, military vehicles, special vehicles (for emergency services, construction machinery, etc.) and agricultural tractors.
- Private car ownership is expressed as passenger cars per capita. Data refer to passenger cars seating not more than nine persons (including the driver), including rental cars, taxis, jeeps, estate cars/station wagons and similar light, dual-purpose vehicles.
- Data describe the situation as of 31 December of the year.
- Data include Secretariat estimates.
- Trends of road traffic intensities per unit of GDP: totals for OECD and OECD Europe include western Germany only and exclude Czech Republic, Hungary and Poland.

USA ➢ Traffic by local and urban buses is excluded.
JPN ➢ Traffic by light vehicles is excluded. Total stocks include three-wheeled vehicles.
AUS ➢ Private car ownership includes utility vehicles.
BEL ➢ Motor vehicles: data are reported on 1 August of the reference year; total stock: road tractors are included.
CZE ➢ Traffic: excludes buses (11.8 billion veh-km in 1996).
DNK ➢ Private car ownership includes vans under 2 tonnes.
FIN ➢ Network length: urban streets are excluded.
FRA ➢ Traffic by buses of the Régie Autonome des Transports Parisiens is excluded. Network length: excludes certain rural roads (700 000 km in 1987). Motor vehicles: data are reported on 1 January.
DEU ➢ Total stocks include tractors. Private car ownership includes "Kombinations-kraftwagen". Change since 1980: western Germany only, referring to 1980-95. Western Germany: except for caravans and large trailers hauled by passenger-carrying vehicles, traffic by special vehicles is included.
GRC ➢ Traffic: data refer to inter-city traffic only. Network length: excludes other roads (estimated at 75 600 km in 1995).
ISL ➢ Traffic by local and urban buses is excluded.
ITA ➢ Traffic by three-wheeled goods vehicles is included.
LUX ➢ Motor vehicles: data are reported on 1 January of the reference year.
NLD ➢ Traffic by trams and subways is included. Motor vehicles: data are reported on 31 July of the reference year.
POL ➢ Total stocks: includes road tractors.
ESP ➢ Traffic: data refer only to traffic on motorways and national roads. Network length: motorways, national roads and secondary roads; excludes other roads (estimated at 175 000 km in 1995).
SWE ➢ Traffic: data include traffic by Swedish passenger cars abroad. Traffic by goods vehicles with a load capacity under 2 tonnes is excluded. Up to 1988, only the public network is included; after 1989, the total network is taken into account.
CHE ➢ Motor vehicles: data are reported on 30 September of the reference year. Private car ownership includes station cars.
TUR ➢ Traffic: data refer only to traffic on motorways and national roads. Network length: national and provincial roads only; village roads are excluded (320 055 km in 1995).
UKD ➢ Traffic and network length: data refer to Great Britain only. Total stocks include special purpose vehicles

AIR EMISSIONS FROM ROAD TRANSPORT

Data sources: IEA - OECD.

CO_2 emissions

- Data refer to CO_2 emissions from road transport fossil fuel combustion and to 1996.

NOx and CO emissions

- Data refer to man-made emissions only.
- % of total emissions: emissions from international transport (aviation and marine) are excluded.
- Data may include provisional figures and Secretariat estimates.
- Data refer to 1996 or to the latest available year from 1993 on.

USA ➢ 1996: 1995 data. CO: emissions from fugitive dust, prescribed burning and other fires are excluded (these emissions amounted to 5 154 kt/y in 1995).
JPN ➢ 1996 :1994 data.
KOR ➢ 1996: 1995 data. NOx: NO_2 only.
AUT ➢ NOx: data refer to "Umweltbundesamt, UNFCCC 98" (IPCC 1995 guidelines).
BEL ➢ CO 1996: 1995 data.
DNK ➢ Data based on the Danish CORINAIR inventories and UNECE format.
FRA ➢ 1996: 1995 data. Change in estimation methodology in 1990.
DEU ➢ 1996 data are provisional.
ISL ➢ Data refer to the IPCC 1995 methodology. % change refers to the period 1982-96.
IRE ➢ Data for totals exclude emissions from industrial processes.
NLD ➢ Estimation methodology changed in 1990.
PRT ➢ 1996: 1995 data. NOx: break in time series in 1990; change in estimation methodology. NOx and CO: since 1990 data include Madeira and Azores Islands.
ESP ➢ 1980: Secretariat estimate. 1996: 1993 data. Break in time series in 1990 (CORINAIR 90).
SWE ➢ NO2 only. CO: since 1990 data refer to FCCC 1997. Data for totals: include international bunkers for aviation and shipping.
CHE ➢ 1996: 1995 data.

ROAD FUEL PRICES AND TAXES

Data sources: IEA - OECD.

- see IEA (1998), *Energy Prices and Taxes, Second Quarter*

- Taxes: includes taxes that have to be paid by the consumer as part of the transaction and are not refundable.
- Diesel fuel: diesel for commercial use.
- Unleaded gasoline: unleaded premium (95 RON) except as noted.
- Prices: expressed in US$ at 1991 prices and PPPs.
- Total energy consumption by road traffic: all fuels used in road vehicles (including military) as well as agricultural and industrial highway use; excludes gasoline used in stationary engines, and diesel oil in tractors that are not for highway use.

CAN ➢ Diesel: 1980 data refer to 1981. Unleaded gasoline: unleaded regular (92 RON).
MEX ➢ Unleaded gasoline: unleaded regular (92 RON).
USA ➢ Diesel: for non-commercial use. Unleaded gasoline: 1980 data refer to 1981.
JPN ➢ Unleaded gasoline: unleaded regular (91 RON).
KOR ➢ 1980 data refer to 1981.
NZL ➢ Unleaded gasoline: unleaded regular (91 RON).
DNK ➢ Unleaded gasoline: unleaded premium (98 RON).
FRA ➢ Up to February 1985 prices were kept within a set range. Figures before 1985 refer to maximum price for Paris. Figures after 1985 refer to average price for all of France.
ISL ➢ Data from Statistics Iceland.

COMMUNICATION TOOLS

Data sources: OECD; UNESCO Statistical Yearbook 1996, Computers Industry Almanach 1998, Matrix Information and Directory Services.

- Internet host: computer system connected to the Internet. Data refer to January 1999. The number of Internet hosts is a lower bound on the size of the public internet in a country, not a precise measurement of the number of online computers. The number of hosts in OECD countries reached 40.8 million in January 1999, or 94% of the world total.

CONSUMPTION OF DURABLE AND NON-DURABLE GOODS

HOUSEHOLD CONSUMPTION EXPENDITURE BY TYPE OF GOODS

Data sources: OECD.

- Data refer to final consumption expenditure in the domestic market by households.
- Durable goods: goods acquired by households which have an expected lifetime of considerably more than one year and a relatively high value, such as motor cars, refrigerators and washing machines. Dwellings are excluded.
- Semi-durable goods: goods acquired by households which have an expected lifetime of use of one year or somewhat more or are not of relatively great value, such as clothing, linens, base-metal cutlery, garden tools, baskets, custom jewellery, electric toasters, hot plates.
- Non-durable goods: goods with an expected lifetime of less than one year.

FOOD CONSUMPTION

Data sources: FAO.

PAPER CONSUMPTION AND RECYCLING

Data sources: OECD, Confederation of European Paper Industries (Brussels), FAO

- Recycling is defined as reuse of material in a production process that diverts it from the waste stream, except for recycling within industrial plants and the reuse of material as fuel. The recycling rate is the ratio of the quantity recycled to the apparent consumption (domestic production + imports - exports). Data refer to 1996: or latest available year; data prior to 1992 were not taken into account.

MEX ➢ Recycling rate is based on amounts of waste generated.
USA ➢ Data refer to the material diverted from the municipal waste stream; recycling rate is based on amounts of waste generated.
BEL ➢ Estimate.
GRC ➢ Amounts recycled exclude imports and exports.
NLD ➢ Data refer to reuse in the paper industry only.
NOR ➢ Collected amounts as % of apparent consumption.

HOUSEHOLD WASTE GENERATION AND MANAGEMENT

Data sources: OECD

- Municipal waste is waste collected by or on the order of municipalities. It includes waste originating from households (post-consumption waste), and similar waste from commerce and trade, office buildings, institutions (schools, hospitals, government buildings), and small businesses. It also includes waste from these sources collected door-to-door or delivered to the same facilities used for municipally collected waste, as well as fractions collected separately for recovery operations (through door-to-door collection and/or through voluntary deposit). Similar waste from rural areas, even if disposed of by the generator, is included. The definition also covers: (i) bulky waste (e.g. white goods, old furniture, mattresses); and (ii) yard waste, leaves, grass clippings, street sweepings, the contents of litter containers, and market cleansing waste, if managed as waste. The definition excludes waste from municipal sewage networks and treatment, as well as municipal construction and demolition waste. National definitions may differ.
- Values per capita are rounded.
- Change since 1980, italics: household waste only.
- Management of municipal waste: categories may overlap because residues from some types of treatment (incineration, composting) are landfilled; categories do not necessarily add up to 100% since other types of treatment may not be covered.

CAN ➢ Data refer to 1992; municipal w.: all w. disposed of, except construction and demolition w., even if not collected by municipalities; includes flows diverted for recycling or composting.
MEX ➢ Municipal w. and PFC data refer to 1996; household w. and management data refer to 1995; landfill: includes open landfill and illegal dumping.
USA ➢ Data refer to 1995; landfill: after recovery and incineration.
JPN ➢ Data refer to 1993.
KOR ➢ Data refer to 1995.
AUS ➢ 1992 Secretariat estimate based on composite total from State/Territory data; may include significant amounts of commercial and industrial waste.
NZL ➢ Data refer to 1995.
AUT ➢ Data refer to 1993; municipal w.: excludes construction site w., which is included in national definition; data on management refer to household w. only.
BEL ➢ Municipal w.: aggregate of 1995 data for Brussels and 1994 data for Flanders and Wallonia; data on management refer to Wallonia only; landfill: excludes residues from incineration and other operations.
CZE ➢ Data refer to 1994; municipal w.: figure extrapolated from new survey; data on management refer to about 80% of municipal w. generated.
DNK ➢ Data refer to 1995; municipal w. data come from a new survey done in treatment plants; data on management refer to household waste only.
FIN ➢ Data refer to 1994; data on management are expert estimates and might include some w. from demolition sites and from sewerage and water treatment.
FRA ➢ Data refer to 1993 and include DOM; municipal w.: includes 5 million tonnes of "Déchets industriels banals"; household w.: includes bulky w.
DEU ➢ Data refer to 1993; municipal w. excludes separate collection for recycling purposes conducted outside the public sector (about 4.9 million tonnes in 1993); this particularly concerns packaging w. (paper, glass, metals, plastics) collected by the Duale System Deutschland; excludes w. directly brought to disposal sites by the

generator and street cleaning w; change since 1980 of the private final consumption expenditure: western Germany only.
GRC ➢ Data refer to 1992 traditional w. collection only.
HUN ➢ Data refer to 1994; municipal w. refers to transported amounts; includes w. from households, offices, firms and services.
ISL ➢ Data refer to 1994.
IRL ➢ Data refer to 1995; management: recycling/composting: recycling only.
ITA ➢ Data refer to 1995; municipal w. includes some w. from municipal sewage network and treatment.
LUX ➢ Data refer to 1995 except for household w. which refers to 1992; municipal w.: excludes separate collection.
NLD ➢ Municipal w. 1995; management: 1994; municipal w.: includes separate collection for recycling purposes, solid w. from sewerage and small amount of mixed building and construction w.; household w.: includes w. paper collected by schools, churches, sport clubs.
NOR ➢ 1995 figures based on a new survey covering all local authorities and treatment plants; it excludes a small amount of construction and demolition waste which was included in 1980.
POL ➢ Data refer to 1995; management: recycling/composting: composting only.
PRT ➢ Data refer to 1994.
ESP ➢ Data refer to 1994.
SWE ➢ Data refer to 1994; data on management refer to househ. w. only.
CHE ➢ Data refer to 1996; municipal w.: includes separately collected waste for recycling (1.7 million tonnes).
TUR ➢ 1991 data based on daily amounts of w. collected in 1 974 municipalities out of a total of 2 033.
UKD ➢ Data refer to 1995-96; household w.: incl. household hazardous w. and clinical w., street clean. w. and litter, w. taken to civic amenity sites for disposal or recycling; management: data related to 88% of households in England and Wales.
TOT ➢ Rounded figures. Data do not include eastern Germany, Czech Rep., Hungary, Poland and Korea.

RECREATION AND TOURISM

INTERNATIONAL TOURISM RECEIPTS

Data sources: WTO; OECD.

- Index : data are based on receipts expressed as 1991 price levels and exchange rates. Totals exclude Mexico, Korea, Czech Republic, Hungary and Poland; 1980 to 1990 data include western Germany only.
- State, 1996 : at current prices and exchange rates. Data for Japan, Austria, Belgium-Luxembourg, Greece, Ireland, Italy and Turkey are Secretariat estimates.

BEL ➢ Belgium-Luxembourg Economic Union.
➢ 1970 data refer to 1971.

HOUSING RELATED ENERGY AND WATER CONSUMPTION

ENERGY CONSUMPTION - INTENSITY AND STRUCTURE

Data sources: IEA - OECD.

- Total Final Energy Consumption: the sum of consumption by the different end-use sectors.
- Trends since the 1970s of intensities per unit of GDP (figure): OECD, and OECD Europe include western Germany only and exclude Czech Republic, Hungary and Poland.
- GDP is expressed at 1991 price levels and purchasing power parities.
- Industry : includes feedstocks from petrochemical industry; does not cover non-energy use of oil products, or energy used in transport in the industry sector.
- Transport: excludes international marine bunkers.
- Other: includes agriculture, commercial, public services and non-energy use of oil products (such as white spirits, paraffin waxes, lubricants, bitumen) and coal by all sectors.

MEX ➢ 1970 data refer to 1971.
KOR ➢ 1970 data refer to 1971.
CZE ➢ 1970 data refer to 1971.
HUN ➢ 1970 data refer to 1971.
TOT ➢ 1970 data refer to 1971.

AIR EMISSIONS FROM RESIDENTIAL ENERGY USE

Data sources: IEA - OECD.

- Data represent only part of the emissions from residential energy use, as the emissions from electricity generation in power stations for residential use are not included.
- Data refer to man-made emissions only.
- % of total emissions: emissions from international transport (aviation and marine) are excluded.
- Data may include provisional figures and Secretariat estimates.
- Data refer to 1996 or to the latest available year from 1993 on.

CAN ➢ SOx: SO_2 only.
USA ➢ 1996: 1995 data. SOx: SO_2 only.
KOR ➢ 1996: 1995 data. NOx and SOx: NO_2 and SO_2 only.
AUS ➢ 1996: 1994 data.
NZL ➢ SOx: SO_2 only.
AUT ➢ Data refer to "Umweltbundesamt, UNFCCC 98" (IPCC 1995 guidelines). SOx: SO_2 only.
CZE ➢ SOx : SO_2 only.
DNK ➢ Data based on the Danish CORINAIR inventories and UNECE format.
FRA ➢ 1996: 1995 data. Change in estimation methodology in 1990.
DEU ➢ 1996 data are provisional.
HUN ➢ SOx: SO_2 only.
ISL ➢ Data refer to the IPCC 1995 methodology. % change refers to the period 1982-96. SOx: SO_2 only.
IRE ➢ 1996: 1993 data. Data for totals exclude emissions from industrial processes.
NLD ➢ Estimation methodology changed in 1990.
PRT ➢ 1996: 1995 data. Break in time series in 1990; change in estimation methodology. Since 1990 data include Madeira and Azores Islands. SOx: before 1990 data refer to SO2 only.
ESP ➢ 1980: Secretariat estimate. 1996: 1993 data. Break in time series in 1990 (CORINAIR 90).
SWE ➢ NOx and SOx: NO_2 and SO_2 only. Data for totals include international bunkers for aviation and shipping.
CHE ➢ 1996: 1995 data.
UKD ➢ SOx: SO_2 only.

ENERGY PRICES AND TAXES

Data sources: IEA - OECD.

- see IEA (1997) "Energy prices and taxes, third quarter, 1997"
- Oil: light fuel oil only.
- Oil and electricity: US$ using current exchange rates.
- Natural gas: US$ per 10^7 kcal (GCV basis) using current exchange rates.
- Real energy end-use prices: refers to real energy end-use prices for industry and households. % change refer to 1980-96 period.

MEX ➢ Energy prices: % change refer to 1982-96 period.
ISL ➢ National data which may differ from those of other OECD countries; industry: medium price for power-intensive industries and other industries.
NOR ➢ Electricity for industry refers to 1991.

WATER ABSTRACTIONS: TOTAL AND PUBLIC WATER SUPPLY

Data sources: OECD, FAO, World Resources Institute (WRI).

- Abstractions: accounts for total water withdrawal without deducting water that is reintroduced into the natural environment after use.
- Abstractions as % of available resources: data refer to total abstraction divided by total renewable resources, except for totals, where the internal resource estimates were used to avoid double counting.
- Renewable water resources: net result of precipitation minus evapo-transpiration (internal) plus inflow (total). This definition ignores differences in storage capacity, and represents the maximum quantity of fresh water available on average.
- Inflow: water flows from neighbouring countries. Includes underground flows.
- Freshwater abstractions by major sector
  - "Public water supply" refers to water supply by waterworks, and may include other uses besides the domestic sector.
  - "Irrigation" refers to self supply (abstraction for own final use). "Others": include industry and electrical cooling (self supply).
- Freshwater abstractions data: refers to 1997 or latest year available (data prior to 1987 have not been considered).

CAN ➢ 1980 and latest year av: 1981 and 1991 data.
MEX ➢ Data include Secretariat estimates for electrical cooling - 1980: based on electricity generation in power stations; latest year av: based on 1994 data. Latest year av: 1995 data.
USA ➢ Latest year av: 1990 data.
JPN ➢ Latest year av: Secretariat estimates based on 1990 and 1994 data.
KOR ➢ Partial totals excluding electrical cooling. Latest year av: 1994 data.
AUS ➢ In Australia the intensity of use of water resources varies widely among regions; one third of the country is arid, one third semi-arid and the high rainfall areas in the north are far from the densely populated areas in the south. 1980: 1977 data adjusted for an average climatic year. Latest year av: 1994 estimated data.
NZL ➢ Partial totals excluding industrial and electrical cooling. 1980: composite total based on data for various years. Latest year av: 1993 estimates.
AUT ➢ Partial totals. Irrigation and industry no cooling: groundwater only. Electrical cooling (includes all industrial cooling): surface water only. Latest year av: 1993 data.
BEL ➢ Secretariat estimates for 1994.
DNK ➢ 1980: 1977 data. Latest year av: 1996 data, including 1995 data for irrigation.
FIN ➢ Partial totals. Latest year av: 1994 data excluding all agricultural uses.
FRA ➢ 1980 and latest year av: 1981 and 1994 data.
DEU ➢ Excluding agricultural uses other than irrigation. Latest year av: 1995 data. Change since 1980: western Germany only; referring to 1980-91.
GRC ➢ Partial totals. Excluding agricultural uses besides irrigation. 1997: excludes also industry; includes data for public water supply which refer only to data from 42 out of 75 great water distribution enterprises.
HUN ➢ Latest year av: 1996 data.
ISL ➢ Data include the use of geothermal water.
IRE ➢ Latest year av: 1994 data; totals include 1980 data for electrical cooling.
ITA ➢ Excluding agricultural uses besides irrigation. 1980: including 1973 estimates for industrial cooling. Latest year av: 1987 data.
LUX ➢ Latest year av: annual average of the 1990-95 period.
NLD ➢ Partial totals excluding all agricultural uses. 1980 and latest year av: 1981 and 1996 data.
POL ➢ Totals include abstractions for agriculture, which include aquaculture (areas over 10 ha) and irrigation (arable land and forest areas greater than 20 ha); animal production and domestic needs of rural inhabitants are not covered.
PRT ➢ Latest year av: 1991 data.
ESP ➢ Excluding agricultural uses other than irrigation. Groundwater: excluding industry except for 1995. Latest year av: hydrological year average, except for electrical cooling (1995 data).
SWE ➢ 1980: include data from different years. Latest year av: 1995 data.
CHE ➢ Partial totals excluding all agricultural uses. Latest year av: 1994 data.
TUR ➢ 1980: partial totals; excluding agricultural uses other than irrigation and electrical cooling.
UKD ➢ Partial totals. England and Wales only. Latest year av: 1994 data. Data include miscellaneous uses for power generation, but exclude hydroelectric power water use.
TOT ➢ Rounded figures, including Secretariat estimates. OECD % change (water abstractions): western Germany only. % of renewable resources: calculated using the estimated totals for internal resources (not total resources as for countries), and considering England and Wales only.

WATER PRICE

Data sources: IWSA (International Water Supply Association), 1997, International Statistics for Water Supply.

- Prices calculated on the basis of a family of four (two adults and two children) living in a house with garden rather than an apartment. Where there are water meters, the price is based on annual consumption of 200 m^3. Where supply is normally unmeasured the average price has been used (Norway and UK). Prices at current exchange rates. VAT is not included.

NZL ➢ Secretariat estimates based on water meter charges for the 1997/98 fiscal year, and considering an annual consumption of 200 m^3.
DEU ➢ Country data which refer to 1997 and are provisional.
NOR ➢ Unmeasured data: refer to the average price.
TUR ➢ Data refer to 1995.
UKD ➢ Unmeasured data: refer to the average price.

WASTE WATER TREATMENT

Data sources: OECD.

- Total served: national population connected to public sewage treatment plants. Includes: primary treatment - physical and mechanical processes which result in decanted effluents and separate sludge (sedimentation, flotation, etc.); secondary treatment - biological treatment technologies, i.e. processes which employ anaerobic or aerobic micro-organisms; tertiary treatment - advanced treatment technologies, i.e. chemical processes.
- Sewerage connection rates: refers to population connected to public sewage network with or without treatment.
- Mid-1990s: data refer to 1995 unless otherwise specified. Data prior to 1993 have not been considered.

CAN ➢ Data refer to 1981, 1986, 1989 and 1994. Secondary usually includes private treatment & waste stabilisation ponds. Tertiary: secondary with phosphorus removal.
MEX ➢ Mid-1990s: 1993 data.
USA ➢ Data refer to 1982, 1984 and 1992. Primary: may include ocean outfalls and some biological treatment. Tertiary: includes 2-3% of non-discharge treatment, e.g. lagoons, evaporation ponds. Excludes rural areas served by on-site disposal systems.
JPN ➢ Mid-1990s: 1996 data. Secondary: may include primary treatment and some tertiary treatment.
BEL ➢ Mid-1990s: Secretariat estimates.
CZE ➢ Mid-1990s: 1997 data.
DNK ➢ 1985 and mid-1990s: 1986 and 1996 data.
FIN ➢ Secondary: 50-80% removal of BOD; tertiary: 70-90% removal of BOD. Mid-1990s: 1993 data.
FRA ➢ 1980 : Secretariat estimates. Mid-1990s: in % of dwellings, which is considered a good estimate of the population connected.
DEU ➢ 1980, 1985 and 1990 data refer to 1979, 1983 and 1991. Until 1985 data refer to w. Germany only.
GRC ➢ 1990: 1992 data. Total treatment mid-1990s (1997 data): include 4% of population served by sink pits whose sludges are transported to waste treatment plants. Since 1993 a new waste water plant of Athens city start working, and about 3 300 000 people start to being served by that plant.
HUN ➢ Mid-1990s: 1993 data.
ISL ➢ Mid-1990s: 1997 data.
NLD ➢ 1980 and mid-1990s: 1981 and 1996 data. Tertiary: includes dephosphatation and/or disinfection.
NOR ➢ Mid-1990s: 1996 data.
POL ➢ 1990 and Mid-1990s: 1992 and 1997 data.
PRT ➢ 1980 and mid-1990s: 1981 and 1994 data.
ESP ➢ 1990: 1992 data.
SWE ➢ Primary: may include removal of sediments. Secondary: chemical or biological treatment. Tertiary: chemical and biological plus complementary treatment.

TUR ➢ Data result from an inventory covering municipalities with an urban population of over 3 000, assuming that the sewerage system and treatment facilities serve the whole population of the municipalities.
UKD ➢ 1994 data: England and Wales only; data refer to financial year (April to March). Subtotals may not add up to the totals due to rounding. Primary: removal of gross solids. Secondary: removal of organic material or bacteria under aerobic conditions. Tertiary: removal of suspended solids following secondary treatment.
TOT ➢ Secretariat estimates, not taking into account Australia. 1980: include w. Germany only; data cover 23 OECD Member countries (Mexico, Korea, Australia, Czech Rep., Hungary and Poland were not taken into account).

PUBLIC EXPENDITURE ON WATER

Data sources: OECD

- Data refer to public pollution abatement and control (PAC) expenditure (see Expenditure item) at current prices and purchasing power parities for the latest available year. PAC activities for soil and water comprise collection and purification of waste water, combating of pollution in the marine environment, prevention, control and monitoring of surface water pollution, combating of pollution of inland surface waters, prevention and combating of thermal pollution of water, abatement of groundwater and soil pollution, and regulation and monitoring. Excludes the supply of drinking water.

CAN ➢ Public sector: subsidies to private sector are included, fees from private sector are subtracted from the expenditure in principle. Business sector: water investments include waste treatment.
KOR ➢ Trial estimate by the Bank of Korea.
AUT ➢ Excludes expenditure concerning protection of nature and landscape and R&D; estimates were made to remove double counting of waste water and waste fees.
CZE ➢ Public and private sectors: Investment expenditure only; PAC investments might be overestimated (see country methodology).
DNK ➢ Data include subsidies and transfers to private sector.
FIN ➢ Public sector: municipalities only; Business sector: ISIC 10 to 40 only (excludes expenditure by private specialised producers).
FRA ➢ 1996 data are provisional.
DEU ➢ Data refer to western Germany only; 1994: provisional data.
GRC ➢ Public sector: Investment expenditure only.
HUN ➢ Public and private sectors: Investment expenditure only.
ISL ➢ Include expenditure on waste water.
POL ➢ Public and private sectors: Investment expenditure only.
ESP ➢ Business sector: Partial figure.
SWE ➢ Data refer to municipalities only.
UKD ➢ Business sector: partial figure; excludes expenditure by private specialised producers.

ANNEX 3 OTHER RELATED CONCEPTS AND APPROACHES

Carrying capacity: Biologists define carrying capacity as the maximum population of a given species that can be supported indefinitely by a defined habit. It has traditionally been used as a measure in the management of wildlife, game, or agricultural livestock. The notion of limits is fundamental to carrying capacity: when the maximum population level is exceeded, the resource base declines and hence so will the population.

Ecological footprint In order to illustrate the unequal world-wide distribution in per capita land use, Rees and Wacknagel (1994[25]) developed the concept of the ecological footprint. It can be defined as the area of land required by a given group of people at a specific standard of living (household, city or country) to provide its resources (productive land and water) and assimilate its waste products, wherever that land may be located. The researchers estimate that for Canada, for example, the per capita claim on land in 1990 (a "footprint" of 4.8ha/cap.) was about three times as high as the global average land availability (estimated at 1.7ha/cap.).

Ecological rucksacks: Ecological rucksacks are concerned with the total weight of material flows involved in the production of a particular good. Thus the real ecological weight of e.g. a motor car includes the weight of its constituent materials (metals, glass, plastic, etc.) plus the weight of soil, rock and wastes removed or created during extraction and processing of those materials. The materials extraction phase often occurs outside the consuming country; ecological rucksacks, like footprints, are concerned with displaced environmental impacts.

Ecospace or environmental space: Friends of the Earth Netherlands developed the environmental space concept as part of its 1992 Sustainable Netherlands Action Plan. Environmental space is the total amount of pollution, non-renewable resources, agricultural land and forests that can be used globally without impinging on access by future generations to the same resources. The Action Plan argues that each country has a right to the same amount of environmental space per capita, and proposes that a phasing-in period up to 2010 is necessary for an equal division of environmental space. Friends of the Earth concluded that the Netherlands is currently consuming more than its fair share of environmental space, and recommended a number of reductions in resource use.

Eco-efficiency: Eco-efficiency is a management strategy based on quantitative input-output measures which seeks to maximise the productivity of energy and material inputs in order to reduce resource consumption and pollution/waste per unit of output, and to generate cost savings and competitive advantage.

Social capital: Sustainable development is usually defined as a process whereby future generations receive at least as much capital per capita as available to the current generation[26,27]. Traditionally this has included natural capital, produced capital and human capital, which together form the basis for economic development and growth. Economic growth means that the composition of capital changes: some natural capital will be depleted and transformed into physical capital. The latter will depreciate and we expect technology to yield more efficient replacement.

These three types of capital only partially determine the process of economic growth, because they overlook the way in which the economic actors interact and organise themselves to generate growth and development. Social capital covering not only human capital but also institutional capital is this missing link. As part of it one can inventory civic associations and their attributes (number of members, frequency of meetings, dimensions of membership along ethnic, kinship or other lines, type of decision-making), as well as institutional arrangements.

Steady state economy: The concept of steady state economy was developed as a paradigm of sustainable development by Herman Daly[28]. It refers to a human economy characterised by constant population, capital stocks and rate of material/energy throughput. Steady state economy is proposed as an alternative to the conventional growth-oriented economic model in which exchange value, abstracted from physical energy and material flows, circulates between firms and households in an closed loop. It is a non-growth economy, maintained at some desired, sufficient level by low rates of maintenance throughput. The concept is intended to reshape notions of economic growth and, more fundamentally, of what constitutes human progress.

For further information the reader is referred to "Sustainable Consumption and Production — Clarifying the Concepts"[4].

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