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ENERGY AND TRANSPORT INDICATORS¹

SUMMARY

This document presents the descriptions of relevant indicators for the guidelines on the application of environmental indicators for Eastern Europe, Caucasus and Central Asia (EECCA). For technical reasons, the descriptions of other indicators are contained in separate documents, as follows: introduction and climate change (ECE/CEP/10/2006/6), air pollution and the ozone layer (CEP/AC.10/2005/4, annex II), water (ECE/CEP/10/2006/7), water, land and biodiversity (ECE/CEP/10/2006/8), agriculture and waste (ECE/CEP/10/2006/9). The Working Group is expected to agree on the guidelines and submit these to the Committee on Environmental Policy for adoption.

FINAL ENERGY CONSUMPTION

General description

Brief definition: Energy consumption, represented by energy supplied to the final consumer's door for all energy uses – both the total and the amount used by major users (transport, industry, services, agriculture and households).

Unit of measurement: Thousand tons² of oil equivalent (ktoe).

¹ Prepared by the secretariat on the basis of the outcome of the Workshop on the Application of Environmental Indicators held on 5–6 July 2004 in Chisinau, Republic of Moldova (CEP/AC.10/2005/4) and the decision taken by the Working Group on the matter at its fifth session (CEP/AC.10/2005/2, para. 23). This document is being submitted on the above date because of processing delays.

² All references to tons hereafter are to metric tons.

Relevance for environmental policy

Purpose: Final energy consumption (total and by user) represents a driving forces indicator and shows trends in final energy consumption.

Issue: The trend in final energy consumption (total and by user) provides a broad indication of progress made in reducing energy consumption and associated environmental impacts by the different end users (transport, industry, services and households). It can be used to help monitor and assess the success of key policies that attempt to influence energy consumption and energy efficiency. The policy objective is to work out and implement particular measures in certain sectors of the economy aimed at increasing the efficiency of energy consumption (or at reducing energy intensity), and hence at reducing negative environmental impacts. Thus, for instance, industry-related strategies include reasonable efficiency standards, financial incentives and liberalization of energy prices. Activities in the household sector focus mainly on the application of energy efficiency standards to construction of new housing, energy pricing reform and public awareness campaigns.

International agreements and targets: The United Nations Framework Convention on Climate Change (UNFCCC) and its Kyoto Protocol call for curbing total greenhouse gas (GHG) emissions, the major share of which is CO₂ emissions caused by burning of fossil fuels. The Kyoto Protocol establishes limits on total GHG emissions for industrially developed countries and for economies in transition. The proposed EU Directive on energy end-use efficiency and energy services (COM/2003/739) aims at boosting the cost-effective and efficient use of energy in the European Union. According to the European Commission's proposal, each Member State should each year save 1 per cent more energy than in the previous year through increased energy efficiency, which, it is hoped, will lead to annual energy savings of around 6 per cent by 2012.

Methodology and guidelines

Data collection and calculations: Final energy consumption is calculated as the sum of final energy consumption from all sectors. These are disaggregated into the categories of industry, transport, households, services and agriculture using the Standard Industrial Classification of 1992. Final energy consumption includes consumption of transformed energy (electric power, public heating, petroleum products, coke, etc.) and primary fuels such as natural gas and renewable energy sources (solar energy, biomass, etc.). Final energy consumption in **industry** includes consumption in all industrial sectors except the "energy sector". Final energy consumption in **transport** includes consumption in all types of transportation (rail, road and air transport and inland navigation). Final energy consumption in **households** includes quantities consumed by households, excluding the consumption of motor fuels for personal transport. Household consumption includes all use of electricity and use of fuels for space and water heating. Final energy consumption in **services** includes consumption by public administration and private services. The service sector in this context includes agriculture, fisheries and other sectors. Final energy consumption in **agriculture** consists of quantities consumed by agriculture, including engines used for agricultural transportation. Final energy consumption in fisheries consists of quantities consumed by the fishing industry, excluding fishing on the high seas. The relative contribution of a specific sector can be measured by the ratio of final energy consumption from that specific sector to the total final energy consumption calculated for a calendar year.

Internationally agreed methodologies and standards: While the indicators of final energy consumption and energy consumption by sectors are widely used, there is no standard methodology.

Data sources and reporting

Data on the final energy consumption by sector are available in national energy balances and national statistical yearbooks. The United Nations Statistics Division (UNSD) collects energy statistics from more than 190 countries and updates and maintains an Energy Statistics Database, as well as a National Accounts Statistics Database, which includes gross domestic product (GDP). The International Financial Statistics database of the International Monetary Fund (IMF) provides nominal and real GDP for most countries. The International Energy Agency (IEA) supports the most comprehensive databases on energy balances and assessments, which are primarily based on national data or on data collected by reliable regional agencies.

References at the international level

- United Nations, *Energy Statistics – Definitions, Units of Measure and Conversion Factors*. Series F, No. 44
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- <http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm>
- <http://themes.eea.eu.int/IMS/CSI/>
- <http://www.iea.org>

TOTAL ENERGY CONSUMPTION

General description

Brief definition: Energy resources, total and by fuel (solid, oil, gas, nuclear and renewable sources), consumed annually in a country.

Unit of measurement: Thousand tons of oil equivalent (ktoe) for total and by fuel, and per cent for shares of different types of fuel.

Relevance for environmental policy

Purpose: Total energy consumption, total and by fuel, is a driving forces indicator describing the development of the energy sector and the corresponding levels of consumption.

Issue: Energy is a key factor in industrial development and the provision of essential services. Traditionally, energy has been considered a key element of economic progress. However, current energy production and consumption practices are having major negative impacts on the environment. These impacts are fuel-specific: for instance, the use of coal as a fuel has a major impact due to extremely high levels of pollutants emissions, whereas natural gas is one of the most environmentally appropriate fossil fuels. However, production and transportation of natural gas appear to be a huge source of GHG emissions. Renewable energy sources have less environmental impact. Long-term objectives include continuous increases in energy efficiency that are higher than increases in energy consumption, as well as switching to consumption of environmentally appropriate renewable energy resources. The indicator reflects primary energy supply or gross domestic energy consumption and serves as a unit of measurement for power inputs in the economy. It is widely used to measure the use of various fuels.

International agreements and targets: The UNFCCC and its Kyoto Protocol call for curbing total GHG emissions, the major share of which is CO₂ emissions caused by burning of fossil fuels. The Kyoto Protocol establishes limits and targets for total GHG emissions for countries included in Annex 1.

Methodology and guidelines

Data collection and calculations: Total energy consumption is a key element of energy balances and relates to “revealed” consumption. Measuring it requires the use of data on revealed rather than actual consumption, and it is calculated based on a formula taking into account production, exports, imports, storage bins and changes in fuel stocks. Production (or primary production) means production of solid fuels (coal, lignite and derivatives), oil (crude oil and petroleum products), gas (natural and derived), nuclear energy and renewable sources (solar energy, energy from biomass and waste, and geothermal, hydropower and wind energy). International trade of energy products is based on the “general trade” system, in which all goods delivered into the country or shipped out of it are registered as export or import goods. Data on changes in stocks mean data on changes in stocks with producers, importers and/or industrial consumers as of the beginning and end of the year. Bins are usually related to the fuel delivered to vessels and aircrafts for international sea and air shipping, irrespective of whether or not they belong to the state. Data on exports, imports, bins and changes in stocks include data on both primary and secondary products (fuel products, such as petrol and lubricants produced from primary fuels). Balance calculation based on the data on total consumption of fuels is carried out according to the following scheme:

For each fuel type it is necessary to measure consumption volume using the following formula:

$$\text{primary production} + \text{import} - \text{export} - \text{bin} \pm \text{changes in stocks}$$

Then, using the conversion multiplier factor for each fuel type, convert the obtained volume values into common energy units. Adding up all consumption values for each fuel type results in the total energy consumption (gross domestic energy consumption).

The relative contribution of a specific fuel is measured by the ratio between energy consumption originating from that fuel and the total gross inland energy consumption calculated for a calendar year.

Internationally agreed methodologies and standards: While the indicator is widely used, there is no standard methodology. Various international recommendations are available.

Data sources and reporting

In EECCA countries, data on consumption of various fuels are available from national statistical agencies; some of the data are also available in national statistical yearbooks. UNSD and IEA publish energy statistics based on reports by various countries including from EECCA. For the European Union, data have been traditionally compiled by Eurostat through the annual Joint Questionnaires of Eurostat and IEA.

References at the international level

- United Nations, *Energy Statistics – Definitions, Units of Measure and Conversion Factors*. Series F, No. 44
- United Nations, Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development and World Bank. *System of National Accounts 1993 (SNA 1993)*. Series F, No. 2, Rev. 4
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- http://europa.eu.int/estatref/info/sdds/en/sirene/energy_base.htm
- <http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm>
- <http://themes.eea.eu.int/IMS/CSI/>
- <http://www.iea.org>

TOTAL ENERGY INTENSITY

General description

Brief definition: Ratio between the gross inland consumption of energy (or total energy consumption) and the GDP calculated for a calendar year at constant prices.

Unit of measurement: Thousand tons of oil equivalent (ktoe) per unit of GDP in US dollars. For

internal use, the GDP should be expressed in the national currency.

Relevance for environmental policy

Purpose: The indicator provides a measure of the response to the efficiency of energy consumption in a country.

Issue: Energy is a key factor in economic progress. However, current energy production and consumption practices are having major negative impacts on the environment. Total energy intensity indicates the general correlation between energy consumption and economic development and provides a basis for approximate assessment of energy consumption and its environmental impact as a result of economic growth. Total energy intensity depends both on the structure of the economy (high- and low-energy-consuming sectors) and on geographical factors (countries in cold climate zones may consume 20 per cent more energy per capita than other countries for heating purposes, whereas countries in hot climates may consume some 5 per cent extra energy per capita for air conditioning). The policy objective is to improve energy efficiency and weaken the correlation between economic growth and energy consumption (decoupling economic growth from energy consumption), particularly the consumption of fossil fuels.

International agreements and targets: There are no particular targets for energy intensity. The UNFCCC and its Kyoto Protocol call for curbing total GHG emissions, the major share of which is CO₂ emissions caused by burning of fossil fuels. The Kyoto Protocol establishes limits and targets for total GHG emissions for countries included in Annex 1. The indicative target for final energy consumption intensity in the European Union, set in the 1998 Communication on Energy Efficiency, is a 1 per cent annual improvement in the intensity of final energy consumption from 1998 “over and above that which would otherwise be attained”.

Methodology and calculations

Data collection and calculations: The gross inland consumption of energy is calculated as the sum of the gross inland consumption of the five types of energy: solid fuels, oil, gas, nuclear energy and energy from renewable sources. In addition, each of these is calculated as an aggregation of various data on the production, storage, trade (imports/exports) and consumption/use of energy. Total energy consumption is calculated using national energy balances. The GDP figures are taken at constant prices to avoid the impact of inflation and are presented with an indication of the base year. GDP is measured in US dollars, converted from real local currency at purchasing power parity for the base year to which local currency was deflated.

Internationally agreed methodologies and standards: Both total energy intensity and energy intensity by sector are widely used. In the European Union, Eurostat has traditionally compiled data for gross inland energy consumption through annual joint questionnaires by Eurostat and the International Energy Agency, following a well-established and harmonized methodology.

Data sources and reporting

UNSD collects energy statistics from more than 190 countries, including from EECCA, and updates and maintains an Energy Statistics Database, as well as a National Accounts Statistics Database, which includes GDP. The International Financial Statistics database of the IMF provides nominal and real GDP for most countries. IEA supports the most comprehensive databases on energy

balances and assessments, which are primarily based on national data or on data collected by reliable regional agencies.

References at the international level

- United Nations, *Energy Statistics – Definitions, Units of Measure and Conversion Factors*. Series F, No. 44
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- <http://www.un.org/esa/sustdev/natlinfo/indicators/indisd/indisd-mg2001.pdf/>
- <http://unstats.un.org/>
- <http://www.worldbank.org>
- http://europa.eu.int/estatref/info/sdds/en/sirene/energy_base.htm
- <http://forum.europa.eu.int/irc/dsis/coded/info/data/coded/en/Theme9.htm>
- <http://themes.eea.eu.int/IMS/CSI/>
- <http://www.iea.org>

RENEWABLE ENERGY CONSUMPTION

General description

Brief definition: The share of renewable energy consumption in a country's total energy consumption for a calendar year.

Unit of measurement: Percent.

Relevance for environmental policy

Purpose: The indicator provides a measure of the response to reducing the environmental impact of energy consumption.

Issue: The dependence of the economy on non-renewable energy resources (fossil fuels) cannot be viewed as steady in the long run, since natural fossil fuel resources are limited, whereas renewable resources can ensure a continuous energy supply. Renewable energy sources can be viewed as the

best option for reducing the negative environmental impacts of energy production and consumption. The related policy objective is to achieve a safe energy supply by gradual replacement of fossil fuels with renewable energy sources. Renewable energy is the energy obtained from the energy streams of the environment. It includes energy produced from renewable non-fossil energy sources: wind, solar, geothermal, wave, tidal, hydropower, biomass, landfill gas, sewage treatment plant gas and biogas energy. The indicator measures the contribution of renewable energy sources to the total consumption of energy.

International agreements and targets: Chapter 4 of Agenda 21 calls for improving efficiency in the use of energy sources and for a transition towards the environmentally friendly use of renewable resources. In the European Union, the European Commission's White Paper "Energy for the Future: Renewable Sources of Energy" (COM(97)599) provides a framework for Member States' actions to develop renewable energy and sets an indicative target of increasing the share of renewable energy in EU-15 total energy consumption to 12 per cent by 2010.

Methodology and guidelines

Data collection and calculations: Measuring renewable energy consumption relates to "revealed" consumption – that is, it envisions the use of data on revealed rather than actual consumption and is calculated based on a formula taking into account production, exports, imports, and changes in fuel stocks. Both data on consumption of energy produced from renewable energy sources and data on gross energy consumption are required. Both types of data may be available in national energy balances, as well as from various international sources of information on energy. Both renewable energy and total energy consumption are measured in ktoe. Therefore, the amount of renewable energy is measured as an absolute value but presented as a percentage. Due to the huge variety of forms and uses of renewable energy resources, data collection may create problems. The comparability of national data is limited by the absence of standard methodologies.

Internationally agreed methodologies and standards: Eurostat and IEA have developed a harmonized methodology.

Data sources and reporting

National data and assessments on renewable energy resources are published in the national statistical yearbooks of some EECCA countries. UNSD and IEA collect data and assessments based on information from national and international sources.

References at the international level

- United Nations, Energy Statistics – Definitions, Units of Measure and Conversion Factors. Series F, No. 44
- Organisation for Economic Co-operation and Development/International Energy Agency. Energy Statistics of OECD Countries and Energy Statistics of non-OECD countries. (issued annually) Part I: Methodology
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- <http://themes.eea.eu.int/IMS/CSI/>
- <http://www.iea.org>

PASSENGER TRANSPORT DEMAND

Brief definition: The number of kilometres traveled per person in a given year by different modes of transport (passenger cars, buses and coaches, trains and air) and the volume of passenger transport relative to GDP at constant prices.

Unit of measurement: Thousand passenger-kilometers (pkm), total and per unit of GDP, in US dollars. For internal use, GDP should be expressed in the national currency.

Relevance for environmental policy

Purpose: Passenger transport demand is a driving force indicator. It is of prime importance in regulating passenger turnover and developing various types of transport. By measuring the decoupling of passenger demand from economic growth, it also helps assess the effectiveness of response measures.

Issue: Travel is an essential part of the economic and social life of a country. The relevance of the modal split policy for the environmental impact of passenger transport arises from difference in the environmental performance (resource consumption, emissions, noise, accidents, etc.) of different modes of transport. Non-motorized travel has low environmental impact, and, due to the level of physical exertion involved, offers health benefits. Motorized travel has greater environmental and social impacts, such as pollution, global warming and accidents. Sustainability implies using the most appropriate mode of transport for the journey in question and decoupling travel from economic development. Policies are needed which support a shift towards less environmentally damaging means and reduce the need for travel. Relative decoupling occurs when demand for passenger transport grows more slowly than GDP. Absolute decoupling occurs when demand for passenger transport falls while GDP rises or remains constant.

International agreements and targets: None. In the European Union, the European Commission's white paper "European Transport Policy for 2010: Time to Decide" (COM(2001) 370) aims to bring about a shift in transport use from road to rail, water and public passenger transport so that the share of road transport in 2010 is no greater than it was in 1998.

Methodology and guidelines

Data collection and calculations: Current statistics should make it possible to calculate at least the performance of travel via passenger car, bus and coach, rail and air. Contributors to compilations of generalized data on passenger carriage include enterprises, agencies and private individuals involved in the transport business. The reporting time in passenger carriage depends on the type of transport: one can use the time when the ticket is acquired (rail, car, municipal electrically driven transport) or

the time of departure (maritime, fluvial and air transport). The time of arrival in passenger carriage statistics is, practically speaking, used only for air transport. Passenger turnover is assessed by adding up the number of passengers by each carriage position by distance of carriage; this is done separately for each mode of transport. All data should be based on movements on national territory, regardless of the nationality of the vehicle. To calculate decoupling trends, demand for passenger transport and real GDP should be shown as an index (e.g. 1995 = 100). The ratio of the former to the latter should be indexed on the previous year (i.e. annual decoupling/intensity changes) in order to be able to observe changes in the annual intensity of passenger transport demand relative to economic growth.

Internationally agreed methodologies and standards: Eurostat/ECMT/UNECE Common Questionnaire on Transport Statistics (passenger transport performance).

Data sources and reporting

Some EECCA countries are reporting relevant data via the Common Questionnaire on Transport Statistics circulated by Eurostat, UNECE and the European Conference of Ministers of Transport (ECMT). In a number of EECCA countries, transport data are published regularly in statistical yearbooks. GDP is published in the UNDS National Accounts Statistics Database. The IMF's International Financial Statistics database provides nominal and real GDP for most countries.

References at the international level

- United Nations, Commission of the European Communities, International Monetary Fund, Organisation for Economic Cooperation and Development and World Bank. System of National Accounts 1993 (SNA 1993). Series F, No. 2, Rev. 4 (United Nations publication Sales No. E.94.XVII.4). (para. 16.80-16.83)
- UNECE, *Annual Bulletin of Transport Statistics for Europe and North America*
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- "EU transport in figures", Statistical Pocketbook, EC, 1999
- "Transport and Environment – Statistics for the Transport and Environment Reporting Mechanism (TERM) for the European Union" (2000)
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- <http://oecd.org/env/>

Brief definition: The indicator will be presented in two different ways:

- (a) Decoupling of freight demand from economic growth: volume of freight transport relative to GDP;
- (b) Modal split share of freight transport: This indicator is defined as the share of road transport in total inland freight transport.

Unit of measurement: For (a), thousand ton-kilometres (tkm) and per unit of GDP in US dollars. (For internal use, GDP should be expressed in the national currency.) For (b), percentage.

Relevance for environmental policy

Purpose: Freight transport demand by mode is a driving force indicator and shows the volume of cargo conveyance in a country.

Issue: Transport is a leading source of GHG and also generates significant air pollution, which can seriously damage human health and ecosystems. Reducing demand would reduce freight transport's environmental burden. Relative decoupling occurs when the demand for freight transport grows more slowly than demand for GDP. Absolute decoupling of freight transport demand from economic growth occurs when the demand falls and GDP continues to rise or remains constant. If demand and GDP both fall, they remain coupled. The relevance of the modal split policy for the environmental impact of freight transport stems from differences in the environmental performance (with regard to resource consumption, GHG, pollutant and noise emissions, land uptake, accidents, etc.) of different transport modes. Shifting freight from road to water and rail is an important strategic element in future transport policy.

International agreements and targets: None. In the European Union, the European Commission's white paper "European Transport Policy for 2010: Time to Decide" (COM(2001) 370) aims to bring about a shift in transport use from road to rail, water and public passenger transport so that the share of road transport in 2010 is no greater than it was in 1998.

Methodology and guidelines

Data collection and calculations: Total inland transport should include transport by road, rail and inland waterways. Calculations relating to transport by rail and inland waterways should be based on movements on national territory, regardless of the nationality of the vehicle or vessel. Calculations relating to road transport should be based on all movements of vehicles registered in the reporting country. The unit of surveillance in freight conveyance statistics is the shipment (a batch delivered on the basis of a freight conveyance contract). Participants in the compilation of summary data on freight conveyances include enterprises, agencies and private individuals involved in the transportation business. Freight turnover is defined as the sum of the products of the mass of freight conveyed in tons multiplied by the distance of conveyance in kilometres. To measure the decoupling of freight demand from economic growth, the volume of freight transport relative to GDP should be calculated, including separate trends for its two components. Both freight demand and real GDP growth should be indexed on 1995. The decoupling indicator is defined as the ratio between ton-kilometres (inland modes) and GDP in constant 1995 prices (in both the national currency and the US dollar equivalent). It should be indexed to reflect changes in the annual intensity of freight transport demand relative to economic growth (i.e. annual decoupling/intensity changes). The indicator should also be presented as the share of road transport in total inland transport (i.e. the modal split share for freight transport).

Internationally agreed methodologies and standards: The Eurostat/ECMT/UNECE Common Questionnaire on Transport Statistics (passenger transport performance).

Data sources and reporting

Some EECCA countries are reporting relevant data via the Eurostat/ECMT/UNECE Common Questionnaire on Transport Statistics. In many EECCA countries, transport data are published regularly in statistical yearbooks. GDP is published in the UNSD National Accounts Statistics Database. The IMF's International Financial Statistics database provides nominal and real GDP for most countries.

References at the international level

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- http://themes.eea.eu.int/sectors_and_activities/transport/indicators/index_html/
- <http://oecd.org/env/>

COMPOSITION OF THE ROAD MOTOR VEHICLE FLEET BY FUEL TYPE

Brief definition: The indicator defines the breakdown of the road motor vehicle fleet by fuel type.

Unit of measurement: The number of motor vehicles by fuel type and share in each category in the total road motor vehicle fleet.

Relevance for environmental policy

Purpose: This is a driving force indicator which shows tendencies in the transport sector's development and is also an indirect indicator of fuel consumption.

Issue: The current transport system poses significant and growing threats to the environment and human health. Combustion of petrol and diesel by motor vehicles leads to considerable GHG emissions and air pollution and jeopardizes human health. Transport policies increasingly recognize the need to improve the shares of transport modes that use environmentally friendly fuels, primarily electric and biofuel vehicles. The promotion of low- and zero-sulphur fuels will enable further decreases in pollutant emissions from road vehicles, while the promotion of biofuels is essential for reducing GHG, especially CO₂. The indicator helps to understand developments in the composition of the road motor vehicle fleet by fuel type, which in turn explains observed trends in transport's impact on the environment.

International agreements and targets: None. In the European Union, current legislation requires the reduction of the sulphur content of fuels to 50 mg/kg (low-sulphur fuels) by 2005 and its further reduction below 10 mg/kg (zero-sulphur fuels) by 2009. The legislation also requires that by 2005 and 2010 biofuels constitute 2 per cent and 5.75 per cent share respectively of EU fuel consumption.

Methodology and guidelines

Data collection and calculations: Data should cover the stock of road motor vehicles, namely, all road vehicles registered in a country on a given date and licensed to use roads open to public traffic. Data should be collected separately for each category of road motor vehicles: passenger cars, motor coaches, buses and trolleybuses, and trucks. For each of these categories, vehicles may be classified according to the type of energy used by the motor. The main types are gasoline (petrol), diesel, gas-powered (liquefied petroleum gases and natural gas), electricity, biofuel (e.g. biodiesel) and other sources (such as alcohols and mixtures of alcohols with other fuels and hydrogen). The electricity and biofuel groups should be also presented as percentages of the total for each vehicle category. The shares may be compared with a baseline year demonstrating trends in fleet composition.

Internationally agreed methodologies and standards: The methodology developed jointly by UNECE, ECMT and Eurostat for the Common Questionnaire on Transport Statistics.

Data sources and reporting

Ministries of Transport in a few EECCA countries collect and report data to UNECE annually.

References at the international level

- UNECE, *Annual Bulletin of Transport Statistics for Europe and North America*
- United Nations, *Glossary for Transport Statistics* (3rd ed.) (2003)
- <http://www.unece.org/trans/main/wp6/wp6.html>
- <http://europa.eu.int/comm/eurostat>

AVERAGE AGE OF ROAD MOTOR VEHICLE FLEET

Brief definition: The indicator defines the average age of the road motor vehicle fleet.

Unit of measurement: The number of motor vehicles by age and percentage of each age group in the total road motor vehicle fleet.

Relevance for environmental policy

Purpose: The average age of the vehicle fleet is a driving force indicator and shows the technical status of the fleet through its age.

Issue: Transport is a leading source of GHG emissions and also produces significant air pollution, which can seriously damage human health and ecosystems. These effects increase with vehicle age. Outdated vehicle equipment is another problem, particularly in EECCA countries. A key priority of state policy for the development of transport systems in EECCA countries should be to improve vehicle fleet composition by replacing older, more polluting vehicles with newer, cleaner ones.

International agreements and targets: None. In the European Union, Directive 2000/53/EC on end-of-life vehicles provides that vehicles sold after 2005 should be at least 85 per cent reusable and/or recyclable and at least 95 per cent reusable and/or recoverable (both percentages in terms of vehicle weight).

Methodology and guidelines

Data collection and calculations: Data should cover the stock of road motor vehicles, namely, all road vehicles registered on a given date in a country and licensed to use roads open to public traffic. A road vehicle's age is the length of time after the first registration of the vehicle, irrespective of the registering country. Data should be presented for each of the five categories of road motor vehicles: passenger cars, motor coaches, buses and trolleys, trucks and road tractors. For each of these categories, the number of vehicles should be broken down by age as follows: ≤ 2 years, ≥ 5 years, ≥ 10 years and > 10 years. Each individual age group may be also presented as a percentage of the total by each vehicle category. The shares may be compared with a baseline year demonstrating trends in the fleet composition.

Internationally agreed methodologies and standards: The methodology developed jointly by UNECE, ECMT and Eurostat for the Common Questionnaire on Transport Statistics.

Data sources and reporting

Ministries of Transport in a few EECCA countries collect and report data to UNECE annually.

References at the international level

- UNECE, *Annual Bulletin of Transport Statistics for Europe and North America*
- United Nations, *Glossary for Transport Statistics* (3rd ed.) (2003)
- <http://www.unece.org/trans/main/wp6/wp6.html>
- <http://europa.eu.int/comm/eurostat>

ROAD TRAFFIC ACCIDENT, MORTALITY AND INJURY RATES

Brief definition: The indicator defines rates of road traffic accidents, mortalities and injuries due to

road traffic accidents.

Unit of measurement: The number of accidents, deaths and injuries per 10,000 inhabitants.

Relevance for environmental policy

Purpose: The indicator provides a measure of impact on human health and is of prime importance for the development of transport safety policy and regulations.

Issue: The indicator serves to demonstrate the level of accidents occurring in different types of transport and their consequences for people. It also helps to define transport injury trends and to assess the impact of preventive measures.

International agreements and targets: Agreement on the Adoption of Uniform Conditions for Periodical Technical Inspections of Wheeled Vehicles and the Reciprocal Recognition of Such Inspections (1997); Agreement on the Establishing of Global Technical Regulations for Wheeled Vehicles, Equipment and Parts Which Can Be Fitted and/or Be Used on Wheeled Vehicles (1998); European Charter on Transport, Environment and Health (1999). The European Union has a Road Safety Action Programme.

Methodology and guidelines

Data collection and calculations: Rates are calculated by dividing the number of accidents, the number of deaths and the number of injuries, respectively, by 10,000 inhabitants. Additional rates may be calculated by dividing the number of accidents, the number of deaths and the number of injuries, respectively, by other indicators of exposure, such as the number of passenger-kilometres or the number of vehicles. According to international agreements, deaths are considered transport-related if they occur within 30 days from the date of the accident. Data on the number of accidents and injuries in relation to the number of wheeled vehicles are maintained by traffic safety authorities. In addition, Ministries of Interiors and/or Ministries of Communication/Statistics usually publish statistical yearbooks which include mortality statistics reported through death certificates. In some countries the Ministry of Health publishes statistics on mortality and morbidity from various causes, including road traffic injuries, as recorded by the health system.

Availability of internationally agreed methodology: Methodologies developed by WHO and UNECE.

Data sources and reporting

Data at the international level are available from the WHO Mortality Database. In a number of EECCA countries, data on the number of transport casualties appear regularly in statistical yearbooks published by government authorities. Development of this indicator makes it possible to create a long-term database and obtain rather comprehensive time series.

References at the international level

- UNECE, *Statistics of Road Traffic Accidents in Europe and North America* (published annually)
- European Conference of Ministers of Transport (ECMT), *Recent Trends in Road Accidents and Policy Issues* (2002)

- <http://www.unece.org/trans/main/wp6/wp6.html>
- <http://www.euro.who.int/hfadb>
- http://www.euro.who.int/eprise/main/WHO/InformationSources/Data/20011017_1
- <http://www.euro.who.int/document/E85061.pdf/>
- http://www.euro.who.int/ehindicators/indicators/200030528_1/
- <http://europa.eu.int/comm/eurostat>
- http://themes.eea.eu.int/sectors_and_activities/transport/indicators/index_html/
- <http://www.cemt.org/stat/conjonct/index.htm>