

# Standard documentation Meta information

(Definitions, explanations, methods, quality)

on the

## Integrated NAMEA (National Accounting Matrix including Environmental Accounts)

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## Executive summary

The aim of the Integrated NAMEA (National Accounting Matrix including Environmental Accounts) is to show the impacts of societal action on the environment. To this end the economic and environment-related data for domestic institutional units is put into a standardised classification system and compared in tabular form. It is part of the environmental accounts and, therefore, a satellite account of the National Accounts (NA).

Its economic data covers production value, gross value added and labour force in full-time equivalences. The environmental data comprises material inputs, energy consumption, air emissions, waste, environmental protection expenditure and environmental taxes.

As an integrated system of economic accounts it uses existing basic statistics (primary and secondary statistics) and processes them according to the specific purpose. The difficulty here is that environmental and economic systems differ in terms of their approach because they have to answer different questions. In order to link both domains, the individual components must therefore be brought into a standardised classification.

To this end the data is classified according to [ÖNACE](#) divisions. For the years 1995 through to 2007 the ÖNACE 2003 version is used and from 2008 the current ÖNACE 2008 version is used. Back calculation of the time series on the basis of ÖNACE 2008 is not possible because not all basic statistics are based on equivalent calculations. ÖNACE 2003 divisions 01 (Agriculture and hunting) to 93 (Provision of other services) are taken into account. According to ÖNACE 2008, however, these are divisions 01 to 96. The individual divisions are grouped together in accordance with the structure of the energy balances.

Within the context of the rules of the NA, the Integrated NAMEA has a number of special features. One of these features is that private households are regarded as an institutional sector (in the role of consumers) rather than as institutional units (producers); in other words, two types of classification criteria are interwoven in the NA, institutional units and institutional sectors. In concrete terms, this means that ÖNACE 2003 economic divisions 95 (Private households as employers of domestic personnel), 96 (Undifferentiated goods-producing activities of private households for own use) and 97 (Undifferentiated service-producing activities of private households for own use), which represent economic activities, are not taken into account. In ÖNACE 2008 the corresponding divisions are: 97 (Private households as employers of domestic personnel) and 98 (Undifferentiated goods-producing and services-producing activities of private households for own use). This means that there is a certain – though small – amount of information loss since the contribution of private households to production value, gross value added and labour force in full-time equivalences is not depicted.

Another special feature here is that two different "geographical" concepts are used to depict the data. Basically the data is based on the residence principle. This means that only such data is taken into account that can be assigned to domestic institutional units, irrespective of whether they perform their work or services within the national territory. This approach corresponds to the "domestic principle" in the output method used in the National Accounts. In the environmental accounts, however, the term "domestic principle" is already used and has a territorial orientation. In order to avoid confusion as a result of this difference in definition, the "domestic principle" of the NA is referred to as the "residence principle". The data in the environmental taxes and material input modules deviates from this residence principle and uses as its basis the above-mentioned domestic principle (territorial principle) of the environmental accounts. This means that it is not the material inputs and the environmental taxes paid by domestic institutional units that are recorded, irrespective of whether they are used or paid at home or abroad. Instead it is the material inputs and environmental taxes paid within Austria that are taken into account, irrespective of whether they are used or paid by domestic or foreign institutional units.

However, it may be assumed that this conceptual distinction does not have any effect on material inputs. There is a difference only in the case of environmental taxes due to the "fuel tourism" of foreign institutional units in Austria.

The Integrated NAMEA is prepared annually. Data is available two years after the end of the reporting period (t+2), although for the purposes of increased timeliness the air emissions accounts, which are part of the Integrated NAMEA, are published in June of the relevant year and the complete Integrated NAMEA is sent by 31 December to the contracting entity and then published. The reporting period comprises in each case one calendar year and the complete time series comprises the years 1995 to 2012, although in some years (see 3.4.1) there is no data available for environmental protection expenditure, hazardous and non-hazardous waste nor for PM10 and PM 2.5 particulate matter.

The Integrated NAMEA was calculated by Statistics Austria for the first time in the years 2001 and 2002 for the 1999 reference period in a pilot project co-financed by Eurostat. Since 2003 it has been a part of the annual work programme of Statistics Austria and is prepared based on a framework agreement under private law regulating the provision of results/analyses from the sphere of environmental and energy statistics on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management. In 2007, the time series was expanded to comprise the years 1995 to 2008.

*Figure 1: Diagram showing the elements of the Integrated NAMEA*

	Physical flows		Financial flows	
Environmental accounts (EnvA)	Material inputs		Environmental protection expenditure	EnvA
	Energy consumption		Environmental taxes	
		Integrated NAMEA	Production value	
	Air emissions (Environment Agency Austria)		Gross value added	NA
	Waste (Environment Agency Austria)		labour force in full-time equivalences	

<b>Integrated NAMEA – Important elements</b>	
<b>Main purpose of the statistics</b>	Depiction of economic and environmental data in a form compatible with the NA.
<b>Observed unit / reporting unit / presentation unit</b>	All domestic institutional units as per the National Accounts with private households considered in their role as consumers.
<b>Type of statistics</b>	Integrated system of statistics
<b>Data sources/Survey techniques</b>	<u>Statistics Austria</u> : National accounts, material flow accounts, energy accounts <u>Environment Agency Austria</u> : Air pollution inventory, waste
<b>Reference period or due day</b>	One calendar year
<b>Periodicity</b>	Annual
<b>Survey participation</b>	Not relevant for the Integrated NAMEA as it is an integrated system of statistics
<b>Legal bases</b>	The work is performed on the basis of agreements under private law with the Federal Ministry of Agriculture, Forestry, Environment and Water Management. From 2013 (i.e. reporting year 2011) the central legal basis for the air emissions account (part of the Integrated NAMEA) is <a href="#">Regulation (EU) No 691/2011</a> of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts.
<b>Regional breakdown</b>	Austria
<b>Availability of the results</b>	t + 2 years
<b>Other</b>	Domestic concept for environmental taxes and material flow accounts; annual revision of all-time series with the exception of environmental protection expenditure and waste.

# 1. General information

## 1.1 Objective and purpose, history

Environmental data can be found as cross-disciplinary material in many areas of statistics. It relates both to physical and financial variables since environmental statistics are concerned primarily with social and economic activities and their effects on environmental systems as well with the condition of and changes to media (soil, water, air etc.). Environmental statistics are complemented by data on reactions (measures) of the state (e.g. the obligation for motor vehicles to be fitted with catalytic converters), companies, private households and international organisations to existing or threatening adverse effects.

The tasks of environmental statistics relate primarily to

- environment-specific transactions in the National Accounts (NA) (environmental protection expenditure, environmental taxes, environment-oriented production and services);
- material flow accounts and physical accounts (material flows: raw materials, foodstuffs, goods, water, pollutants);
- the linking of monetary data and economic indicators for environmental impact with emissions of pollutants, e.g. within the framework of a NAMEA matrix;
- aspects of environmental quality (e.g. water, soil, ecosystems, species diversity, landscape etc.) and
- natural resource accounts, although only to a limited extent.

All these tasks are grouped together under the term environmental accounts (see Fig. 1). Their core is the **NAMEA**.

The fundamental idea of a NAMEA (National Accounting Matrix including Environmental Accounts) is to bring together the classifications of economic and environmental data, such that a direct comparison of parameters from both spheres is possible. Using a standard breakdown of economic sectors according to ÖNACE classifications as well as taking into account the private households institutional sub-sector, the intention is to bring together commonly used economic indicators, e.g. production value/labour, with environment-related material flows and/or the environment-related expenditure of individual sectors. The aim is to assign external environmental and social costs to those responsible in accordance with the principle of sustainable development. Comparisons of this sort shift the focus from economic results to environmentally relevant data. The concept originates from the Netherlands and was developed by that country's national statistical office. The first NAMEA was published in 1986.

After the European Commission had highlighted in the Fifth Environmental Action Programme the need to apportion responsibility for environmental damage between the public authorities and the parties responsible for the damage ("internalisation of external costs") as well as the striking lack of suitable data available for this purpose, there were concrete proposals in 1994 in this direction in the Communication from the Commission<sup>1</sup> to the Council and the European Parliament on "Directions for the EU on environmental indicators and green national accounting: the integration of environmental and economic information systems". A phased plan to implement these directions was developed by the Commission in June 1996, which also serves as a guideline for Austria. The NAMEA, which was developed in the 1980s by the Dutch national statistical office, forms an element of this.

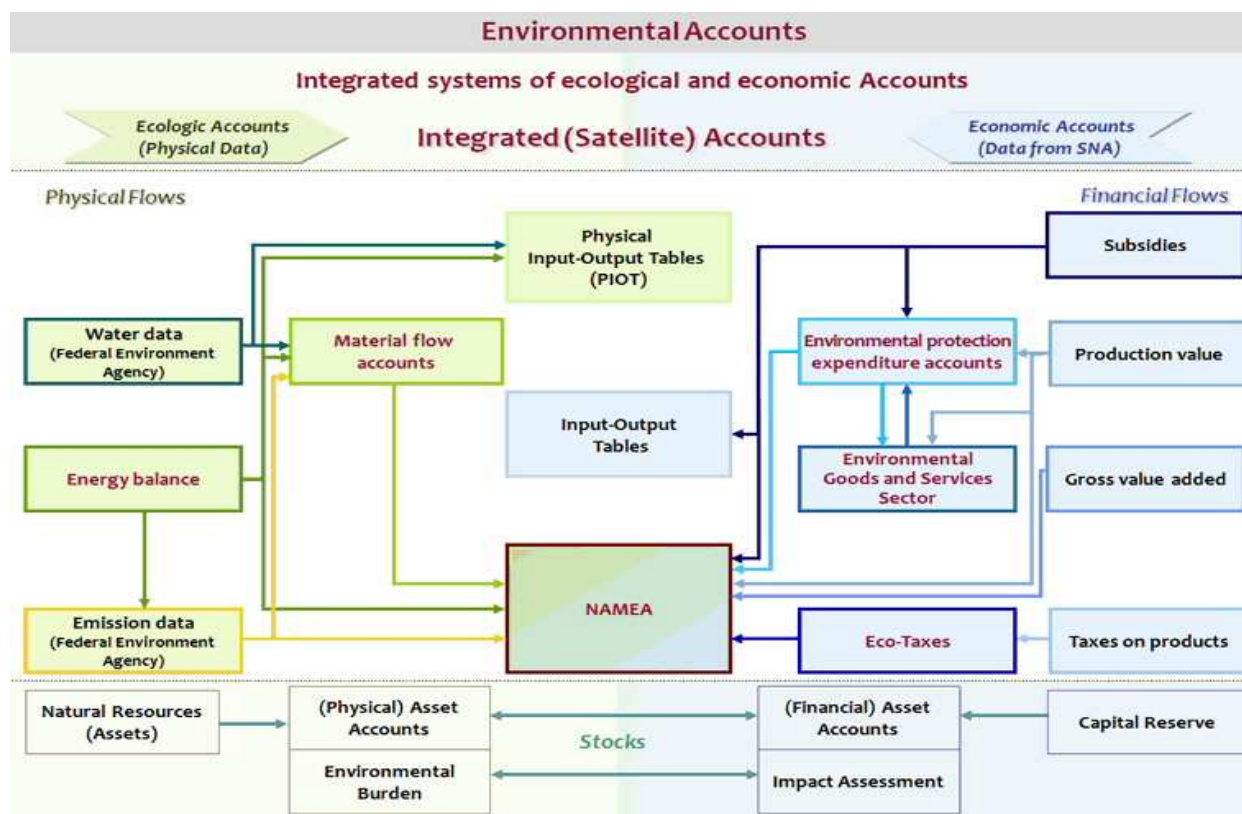
In autumn 1996 it was agreed between the Statistical Office of the European Union (Eurostat) and the statistical offices of most member states to implement projects to create NAMEAs. To this end, in October 1996 a resolution of the **Austrian National Council** called for "... the taking

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<sup>1</sup> COM (94) 670 final, 21.12.1994; approved by the European Parliament on 11.10.1995.

of further measures in future to ensure the rapid expansion of the system of the traditional NA (National Accounts) in a comprehensive and internationally agreed manner with the addition of a statistical system to describe the links between the environment and economic and social systems in accordance with the principle of the "greening" of the NA ...".

Fig. 2: Environmental accounts



In 1997, Austria created a first NAMEA for air pollutants for the year 1994. NAMEAs for water emissions and waste followed in 1998. In 2000, a NAMEA for air pollutants with time series for the years 1980 to 1997 was presented, and finally in 2002 the first Integrated NAMEA<sup>2</sup> for the 1999 reporting period was created within the framework of a project co-financed by Eurostat. Since 2003 it has been part of the annual work programme of Statistics Austria and is prepared based on a framework agreement under private law regulating the provision of results/analyses from the sphere of environmental and energy statistics on behalf of the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

It represents to some extent the second stage of the NAMEA. The specific emissions that in the first stage were evaluated, assigned to economic sectors and to the private households institutional sub-sector and linked to economic indicators were processed using an integrated approach and further environmental information was added.

The aim of this Integrated NAMEA was to show that the integration of the various environmental accounts (final energy consumption, material flow accounts, environmental protection expenditure accounts and environmental taxes) with the basic elements of the NAMEA (emission data and economic indicators) can provide interesting information about the uncoupling of economic growth and resource consumption and/or environmental effects – the dominant theme in the area of sustainable development.

It compared economic data, comprising production value, gross value added and labour force, with environmental data, comprising material flows, final energy consumption, air pollution emissions, waste and environmental protection expenditure. In 2003, environmental taxes were

<sup>2</sup> Gerhold (2002b)



added and in 2008 employed economically active persons were replaced by labour force in full-time equivalences (self-employed and employed). In 2009, the energy balances were replaced as a data source by the energy accounts and energy consumption was included instead of final energy consumption. Finally, in 2010, air emissions (air emissions accounts) started to be published earlier (in the 3<sup>rd</sup> quarter) to ensure the data was more up to date.

Data from the 1995 reporting period onwards is recorded in the Integrated NAMEA and the time series now extends to the 2012 reporting period.

The annual project reports are delivered to the contracting entity.

In accordance with the requirements of the Regulation on European Environmental Accounts, it is planned to add "industrial gases" (F gases) to the content of the Integrated NAMEA over the next few years.

## **1.2 Contracting entity**

Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW)

## **1.3 Main users**

- Federal Chancellery and federal ministries
- Environment Agency Austria GmbH
- University and non-university research institutes (SERI, IFF, University of Vienna, Johannes Kepler University Linz etc.)
- Eurostat
- OECD
- WIFO
- Public, media
- Interest groups

## **1.4 Legal basis**

At European level two regulations are relevant for the Integrated NAMEA. Firstly, [Regulation \(EC\) No. 2150/2002](#) of the European Parliament and of the Council of 25 November 2002 on waste statistics, and secondly, [Regulation \(EU\) No. 691/2011](#) of the European Parliament and of the Council of 6 July 2011 on European environmental economic accounts. The latter regulation obliges member states to add the following modules to the national accounts: air emissions, environmental taxes by economic activity and economy-wide material flow accounts. This regulation thereby creates a legal basis for three sub-sectors of the Integrated NAMEA, namely air emissions, material inputs and environmental taxes.

Nationally the work is commissioned through multi-year contracts by the Federal Ministry of Agriculture, Forestry, Environment and Water Management. The last contractual period had an end date of 31.12.2012 and a new contract is currently in preparation.

# **2. Concepts and processing**

## **2.1 Statistical concepts and methodology**

### **2.1.1 Statistical purpose**

The purpose of the statistics/work is to depict economic and environmental data using a method similar to the NA. The breakdown into economic sectors and the private households sub-sector corresponds to the format described in point 2.1.2.

## 2.1.2 Observed unit / reporting unit / presentation unit

### Observed units:

- Data from the National Accounts (NA):
  - The observed unit for production value, gross value added and labour force in full-time equivalences is the "local kind-of-activity unit". This local kind-of-activity unit is part of an activity unit that is generally designated in Austria as a "Betrieb" (establishment). A kind-of-activity unit groups together within an institutional unit all components that contribute to the exercise of a production activity at four-digit level (class) of the ÖNACE. The local kind-of-activity unit is the component of the kind-of-activity unit that is located at local level (local unit of employment).

Institutional units are economic units, which may be owners of goods and assets and which may enter independently into engagements, exercise economic activities and conduct transactions with other units. In the ESA the institutional units are grouped together in five institutional sectors (non-financial corporations, financial corporations, government, households and non-profit institutions serving households).

Households are taken into account not as economic units but in their function as consumers.
  - In respect of environmental taxes, the observed units are primarily the national government, federal provinces and municipalities. Only in exceptional cases, e.g. if the expenditure for taxes and levies can clearly be assigned to the types of tax, are the enterprises also taken into account as observed units in their function as institutional units. For further details please refer to the [Standard Documentation for Public Accounts Statistics – Public Sector](#) (in German).
- Material inputs:

The observed units are institutional units and private households in their function as consumers.
- Energy consumption:

The observed units are local kind-of-activity units and private households in their function as consumers.
- Environmental protection expenditure:

The observed units are local kind-of-activity units and private households in their function as consumers.
- Air emissions:

The observed units are the activities as defined in the SNAP classification (Selected Nomenclature for sources of Air Pollution).
- Waste:

For more detailed information about the observed units, please refer to the [Waste Quality Report of the Federal Environmental Agency for 2008](#) (in German).

## Reporting units

No surveys are carried out in conjunction with the Integrated NAMEA. For information on reporting units please refer to the relevant basic statistics.

### Presentation units:

The presentation units for the years 1995 to 2007 are the economic divisions (ÖNACE 2003 2-digit codes) 01 (Agriculture) to 93 (Provision of other services). For the years 2008 to 2012 the presentation units are ÖNACE 2008 2-digit codes 01 (Agriculture, hunting and related activities) to 96 (Other personal service activities) as well as the private households institutional sub-sector.

According to ESA 95, private households can have two roles in the economic system – the role of producer and that of consumer. Because of the model used, private households are viewed in a NAMEA solely as consumers, which is why the household-related ÖNACE 2003 divisions 95 (Private households as employers of domestic personnel), 96 (Undifferentiated goods-producing activities of private households for own use) and 97 (Undifferentiated service-producing activities of private households for own use), which represent economic activities, are not taken into account. The corresponding 2-digit codes in ÖNACE 2008 are 97 (Private households as employers of domestic personnel) and 98 (Undifferentiated goods-producing and services-producing activities of private households for own use).

Division 99 (Extra-territorial organisations and bodies), which appears in both versions of the ÖNACE, is also not taken into account because the "residence principle" is used for the NAMEA, i.e. only data from persons or institutional units resident in Austria are taken into account, irrespective of whether this data relates to activities performed within the country or abroad. Extra-territorial organisations and bodies are not counted as resident institutional units.

The breakdown into economic divisions can be found in the table in [Annex 1](#) (in German).

## 2.1.3 Data sources, coverage

### Data sources:

#### ➤ National Accounts (Statistics Austria)

Data about production value at basic prices, gross value added at basic prices and the employed and self-employed labour force in full-time equivalences is taken from the National Accounts. Environmental taxes also come originally from the National Accounts, but some recoding and conversions are performed within the environmental accounts and these taxes are assigned to the energy, transport, resources and environmental pollution tax groups.

#### ➤ Material flow accounts (Statistics Austria)

These are a component of the environmental accounts. They depict the material flows between the environment and a socio-economic system on the one hand and between different socio-economic systems on the other hand. The material flow accounts of Statistics Austria depict the material flows between the Austrian economic system, the Austrian environment and the rest of the world. The flows are shown in an aggregated form as fossil materials, biomass and mineral materials.

#### ➤ Energy accounts (Statistics Austria)

These are also a component of the environmental accounts. The energy consumption of domestic institutional units is recorded in the energy accounts, irrespective of where it takes place. The Integrated NAMEA includes household consumption (final energy consumption), intermediate consumption (final energy consumption and transformation input of the

economy and energy sector consumption) and emission-relevant transport losses of natural gas, coke oven gas and blast furnace gas.

➤ Austrian Air Pollution Inventory (Environment Agency Austria GmbH)

In order to meet national and international reporting obligations in the area of air emissions, the Environment Agency Austria prepares an Air Pollution Inventory each year that details the annual emissions of air pollutants and greenhouse gases for the territory of Austria. In the case of major individual sources the emissions are measured continually over the entire year, whereas for the various minor individual sources (households, transport etc.) individual measurements are used for model calculations.

➤ Dispatch note analysis (Environment Agency Austria GmbH)

The data on hazardous waste comes from an analysis of dispatch notes. Where hazardous waste is transferred to another legal person, a dispatch note must be carried and passed on to the authorities according to the Austrian Waste Management Act (AWG) 2002 and the Austrian Waste Control Regulation 2003. The dispatch note data is electronically recorded and processed – since 2007 in the EDM system ([www.edm.gv.at](http://www.edm.gv.at)). The assignment of waste to economic sectors is performed on the basis of industry information contained in the master data of the waste owner.

➤ Administrative sources and voluntary surveys (Environment Agency Austria GmbH)

Data on non-hazardous waste comes from administrative sources and voluntary surveys.

➤ Environmental protection expenditure accounts (Statistics Austria)

These are also a module of the environmental accounts. At their core are economic (monetary) transactions for the reduction and avoidance of environmental impacts as well as the use of the environment, whereby production, use and financing of environmental protection activities are depicted according to the individual actors and environmental sectors.

➤ Environmental taxes (Statistics Austria)

As previously mentioned, environmental taxes are a component of the environmental accounts. By definition, they include those taxes whose bases of assessment have a verified damaging impact on the environment, for instance a process or product that pollutes the environment, threatens nature or consumes non-renewable resources. These taxes are broken down into energy, transport, pollution and resource taxes. The data is collected for Austria on an annual basis. A list of the various environmental taxes in Austria can be found in [Annex 2](#) (in German).

**Coverage:**

The Integrated NAMEA covers all domestic institutional units in accordance with the National Accounts, whereby, as previously mentioned, private households are treated as consumers, i.e. the ÖNACE 2003 divisions 95 (Private households as employers of domestic personnel), 96 (Undifferentiated goods-producing activities of private households for own use) and 97 (Undifferentiated service-producing activities of private households for own use), which represent economic activities, are not taken into account. The corresponding 2-digit codes in ÖNACE 2008 are 97 (Private households as employers of domestic personnel) and 98 (Undifferentiated goods-producing and services-producing activities of private households for own use). Similarly, division 99 (Extra-territorial organisations and bodies), which appears in both versions of the ÖNACE, is also not taken into account because these are not domestic institutional units.

The data in the environmental tax and material inputs modules differs from the residence concept, which is essentially used by the NA, and is based on the domestic concept (territorial principle). This means that it is not the material inputs and environmental taxes paid by domestic institutional units, irrespective of whether they are used/paid at home or abroad, that are recorded. Instead it is the material inputs and environmental taxes paid in Austria that are taken into account, irrespective of whether they are used or paid by domestic or foreign institutional units. It can however be assumed that this conceptual distinction does not have any effect on material inputs. There is a difference only in the case of environmental taxes due to the "fuel tourism" of foreign institutional units in Austria.

For a detailed description of the residence and domestic concepts, please refer to point 2.1.11.

#### **2.1.4 Reporting unit and respondents**

No data is collected in conjunction with the Integrated NAMEA. For information on the reporting unit/respondents, please refer to the relevant basic statistics.

#### **2.1.5 Survey format**

No data is collected in conjunction with the Integrated NAMEA. For information on survey format, please refer to the relevant basic statistics.

#### **2.1.6 Sample characteristics**

No data is collected in conjunction with the Integrated NAMEA. For information on sample characteristics, please refer to the relevant basic statistics.

#### **2.1.7 Survey techniques / data transmission**

No data is collected in conjunction with the Integrated NAMEA. For information on the survey techniques/data transmission, please refer to the relevant basic statistics.

#### **2.1.8 Survey questionnaire (including explanatory notes)**

No data is collected in conjunction with the Integrated NAMEA. For information on the survey questionnaire (including explanatory notes), please refer to the relevant basic statistics.

#### **2.1.9 Survey participation**

No data is collected in conjunction with the Integrated NAMEA. For information on participation in the survey, please refer to the relevant basic statistics.

#### **2.1.10 Variables surveyed and derived, indicators (including definitions)**

##### **Variables surveyed:**

No data is collected in conjunction with the Integrated NAMEA. For information on the variables surveyed, please refer to the relevant basic statistics.

##### **Variables derived:**

- Production value at basic prices (chain-linked volumes based on previous year's prices):  
This comes from the National Accounts and corresponds to the value of all goods produced during the accounting period, including those goods and services that one local kind-of-activity unit supplies to another local kind-of-activity unit belonging to the same institutional unit, and those goods that are still in inventories at the end of the period, irrespective of their subsequent use. The production values of the individual economic sectors are displayed as chain-linked volumes on the basis of the previous year's prices in order to eliminate price effects.

- Gross value added at basic prices (chain-linked volumes based on previous year's prices): This comes from the National Accounts and includes compensation of employees, depreciation/write downs, taxes on products minus product subsidies (= net taxes on production) and operating surplus/mixed income. The gross value added values of the individual economic sectors are displayed as chain-linked volumes on the basis of the previous year's prices in order to eliminate price effects.
- Labour force in full-time equivalences: The number comes from the National Accounts. This is calculated by splitting the volume of work of the labour force (= amount of hours actually worked by the economically active population within the production boundaries of the ESA) between the number of employment relationships in normal working hours. In this calculation the volume of work is divided by the number of hours normally performed on average per full-time job in the relevant ÖNACE 2-digit code.
- Biomass: Biomass is defined as the volume of all organic materials of a biogenic, non-fossil nature. This comes from the environmental statistics and therefore includes materials living and growing in nature and resulting waste materials, as well as living and dead organic biomass. The material flow accounts include that volume of biomass that is taken from the domestic environment and flows into the production system, as well as imported biomass. Since, by definition, the production of livestock lies within the production system, it does not represent biomass.
- Fossil materials: This group also comes from the environmental statistics and includes the volumes of oil, natural gas, coal and peat taken from the natural environment and flowing into the production system, as well as imported volumes of such materials, plus petroleum products, chemical products and plastic products.
- Mineral materials: This group comes from the environmental statistics and includes metal ores and non-metallic minerals taken from the natural environment and flowing into the production system, as well as imported products subsumed within this group.
- Energy consumption: Energy consumption comes from the energy statistics and, within the meaning of this Integrated NAMEA, comprises final energy consumption, transformation input of the economy, energy sector consumption as well transport losses of natural gas, coke oven gas and blast furnace gas. Final energy consumption is that volume of energy provided to the consumer for conversion into useful energy (room heating, lighting, IT, mechanical work etc.) and is calculated from the gross domestic consumption minus the balance from transformation input and output and minus the consumption of the "energy sector" and non-energy consumption. Transformation input is that volume of fuel that is used for the creation of secondary fuel products as well as for the generation of electricity and heat. The "energy sector" should not be viewed here as in the National Accounts. It comprises the ÖNACE 2003 divisions 10 (Mining of coal and lignite), 11 (Extraction of crude petroleum and natural gas as well as associated services), 40 (Energy supply), as well as ÖNACE groups 23.1 (Coke oven products), 23.2 (Manufacture of refined petroleum products) and 23.3 (Manufacture of nuclear fuel). According to ÖNACE 2008 it comprises the economic sectors 05 (Mining of coal), 06 (Extraction of crude petroleum and natural gas), 08.92 (Mining of lignite), 09.1 (Provision of services for the extraction of crude petroleum and natural gas), 19 (Coke oven products and manufacture of refined petroleum products) and 35 (Energy supply). The transport losses of natural gas, coke oven gas and blast furnace gas are taken into account in the Integrated NAMEA since these are relevant to emissions and are therefore also included in the Air Pollution Inventory of the Environment Agency Austria.
- Environmental protection expenditure: The data on environmental protection expenditure comes from the environmental statistics and is calculated on the basis of the standard European SERIEE methodology which depicts production, usage and financing of environmental protection services by environmental sector. In the Integrated NAMEA expenditure in the protection of ambient air and climate environmental sector, as well as in the waste management environmental sector, is compared to the air emissions in the

economic sectors and the private households institutional sub-sector and/or their hazardous and non-hazardous waste.

- Air emissions: These include all flows of gaseous and particulate substances from the economic system (production and consumption processes) into the (domestic and rest of the world) atmosphere as part of the environment. This implies that only emissions caused by man (anthropogenic) and not natural emissions are taken into account. The following substances from the list of air pollutants and greenhouse gases contained in national and international reporting are included in the Integrated NAMEA: sulphur dioxide (SO<sub>2</sub> and SO<sub>3</sub> stated as SO<sub>2</sub>), mononitrogen oxides (NO and NO<sub>2</sub>), volatile organic compounds excluding methane (NMVOC), methane (CH<sub>4</sub>), carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), dinitrogen monoxide (N<sub>2</sub>O), ammonia (NH<sub>3</sub>) and particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>). They come from the environmental statistics.
- Environmental taxes: These include those taxes whose bases of assessment have a verified damaging impact on the environment. They are grouped together in the energy tax, transport tax, pollution tax and resource tax groups. They come from the National Accounts.
- Waste: Waste includes those movable items that the owner wishes to dispose of (or has already disposed of) or whose recording and treatment as waste lies in the public interest. The depiction is broken down into hazardous and non-hazardous waste. They come from the environmental statistics.

### 2.1.11 Classifications used

The linking of economic and environmental data was based from 1995 to 2007 on the [ÖNACE 2003](#) classification and from 2008 onwards on [ÖNACE 2008](#). The switch to the ÖNACE 2008 classification was performed in 2011 in line with the National Accounts.

The Integrated NAMEA follows the "residence concept", according to which only institutional units registered in the national territory are recorded, irrespective of whether they perform their services in the national territory or not. Extra-territorial organisations and bodies (ÖNACE 99) are not domestic institutional units and are therefore not included. This approach corresponds to the "domestic concept" in the output method used in the National Accounts. However, the term "domestic concept" already exists in the environmental statistics and has a territorial orientation; according to this concept all emissions produced in Austria, e.g. greenhouse gases and air pollutants, must be assigned to Austria irrespective of whether they are caused by domestic or foreign institutional units. In order to avoid confusion as a result of this difference in definition, the "domestic concept" of the NA is referred to as the "residence concept". This differentiation is only significant in respect of greenhouse gases and air pollutants and in respect of energy consumption since foreign units are recorded via domestic fuel sales and the resulting air emissions. In the other modules there is no need for a differentiation of this type since only domestic institutional units are taken into account because of the model on which these modules are based.

The difficulty with the Integrated NAMEA is that different classifications are used in the data sources and the data from these classifications has to be transferred to the ÖNACE classification system. However, this problem does not occur with all data sources.

#### ➤ Material inputs

The material flow accounts are based on the Eurostat methodology manual [Economy-wide material flow accounts and derived indicators](#). Fossil fuels are assigned to the economic sectors (based on the [ÖNACE](#) classification) and to the private households institutional sub-sector. The breakdown is taken from the energy balances. In terms of biomass and mineral materials, the assignment to ÖNACE divisions is based on the [PRODCOM](#), [Combined Nomenclature \(CN\)](#)

and expert knowledge. Further details can be found in the [Standard Documentation – Material Flow Analysis](#) (in German).

➤ **Energy consumption**

The energy accounts use the ÖNACE classification system. Further details of the energy accounts can be found in the [Standard Documentation – Energy Accounts](#) (currently only available in English).

➤ **Environmental protection expenditure**

The environmental protection expenditure accounts use the ÖNACE classification system. There are therefore no problems in determining environmental protection expenditure at ÖNACE 2-digit code level. The assignment of environmental protection expenditure to the individual environmental protection activities is based on [CEPA](#) (Classification of Environmental Protection Activities). Further details can be found in the [Standard Documentation – Environmental Protection Expenditure Accounts](#) (in German).

➤ **Environmental taxes**

The ÖNACE classification system is used for environmental taxes. The assignment of environmental taxes to the four groups is based on the manual [Environmental taxes - A statistical guide](#). Further details can be found in the [Standard Documentation – Environmental Taxes](#) (in German).

➤ **Air emissions**

Air emissions are calculated by the Environment Agency Austria according to the [CORINAIR](#) system of the European Environment Agency using the SNAP classification system and recorded in the Austrian Air Pollution Inventory (OLI). This data is assigned to the economic sectors and the private households institutional sub-sector based on the Eurostat [Manual for Air Emissions Accounts](#).

➤ **Waste**

The division of waste into hazardous and non-hazardous waste is based on the statutory regulations for the determination of hazardous waste as well as for the exemption of hazardous waste (verification of non-hazardous nature). The respondents are assigned to the economic sectors (based on the ÖNACE classification system) and to the private households institutional sub-sector.

➤ **Production value**

This data is based on the European System of Accounts (ESA 95). For further details please refer to [Standard Documentation – National Accounts](#) (in German).

➤ **Gross value added**

This data is based on the European System of Accounts (ESA 95). For further details please refer to [Standard Documentation – National Accounts](#) (in German).

➤ **Labour Force**

This data is based on the European System of Accounts (ESA 95). For further details please refer to [ESA 95](#).

## 2.1.12 Regional breakdown of the results



The results are depicted for Austria.

**2.2 Production of statistics, processing, quality assurance measures**

**2.2.1 Data capture**

No data is collected in conjunction with the Integrated NAMEA. For information on data collection, please refer to the relevant basic statistics.

**2.2.2 Coding**

There is no coding in conjunction with the Integrated NAMEA. For information on coding please refer to the relevant basic statistics.

**2.2.3 Editing and verification of data sources used**

The plausibility check for air emissions data is performed with the support of experts from the Environment Agency Austria. The check is based on whether the assignment of emissions from non-specific activities to economic areas and the private households institutional sub-sector is sensible. There is either no information – which means that proxies need to be used – or insufficient information for this assignment. A plausibility check of waste data is not performed since the data is directly assigned to economic areas and the private households institutional sub-sector by the Environment Agency Austria and is only aggregated for the purposes of the Integrated NAMEA. Plausibility checks are also not normally performed for in-house data sources as these can be assumed to have been performed during data acquisition. The responsible section is, however, contacted in the case of irregular data.

**2.2.4 Imputation (where responses are missing or data incomplete)**

There is no imputation in conjunction with the Integrated NAMEA. For information about imputation please refer to the relevant basic statistics.

**2.2.5 Grossing up procedures (weighting)**

There is no grossing up in conjunction with the Integrated NAMEA. For information about grossing up please refer to the relevant basic statistics.

Weighting is only performed in the assignment of the air emissions. For more information please refer to points 2.2.6 and 3.2.2. Otherwise weighting is performed in the basic statistics, which is why you are referred to this data.

**2.2.6 Compilation of the final data set, (other) models and statistical estimation techniques used**

*Figure 3: Integrated NAMEA and its data sources*

	Physical flows		Financial flows	
Environmental accounts (EA)	Material inputs		Environmental protection expenditure	EA
	Energy consumption		Environmental taxes	
		Integrated NAMEA	Production value	
	Air emissions (Environment Agency Austria)		Gross value added	NA
	Waste (Environment Agency Austria)		labour force in full-time equivalences	

## **Calculation models employed:**

### Production value:

The data transferred at ÖNACE 2-digit level at current (nominal) and last year's (real) prices is aggregated in the Integrated NAMEA in accordance with the breakdown of economic sectors (see Table 1). The chain-linked volumes (based on the previous year's prices) are then calculated for the individual economic sectors. No further calculation steps are performed. For further details please refer to [Standard Documentation – National Accounts](#) (in German).

### Gross value added:

The data transferred at ÖNACE 2-digit level at current (nominal) and last year's (real) prices is aggregated in the Integrated NAMEA in accordance with the breakdown of economic sectors (see Table 1). The chain-linked volumes (based on the previous year's prices) are then calculated for the individual economic sectors. No further calculation steps are performed. For further details please refer to [Standard Documentation – National Accounts](#) (in German).

### labour force in full-time equivalences:

The data transferred at ÖNACE 2-digit level is aggregated in the Integrated NAMEA in accordance with the breakdown of economic sectors (see [Annex 1](#), in German). No further calculation steps are performed. For further details please refer to [ESA 95](#).

### Material inputs:

The material inputs are depicted in the material flow accounts at macro-economic level. For the purposes of the Integrated NAMEA the data is disaggregated in accordance with the breakdown in [Annex 1](#) (in German). For biomass and mineral materials this is performed based on the usage tables in the National Accounts. The assignment of fossil materials is performed primarily based on Final Energy Consumption. Solely imported products consisting primarily of fossil materials are assigned based on export trade data to the relevant first users under the economic sectors and the private households institutional sub-sector. No further calculation steps are performed. For further details please refer to the [Standard Documentation – Material Flow Accounts](#) (in German).

### Energy consumption:

The data included in the Integrated NAMEA relating to energy consumption is provided by the energy accounts at the level of the ÖNACE 2-digit codes and of the private households institutional sub-sector for reasons of consistency<sup>3</sup> from 1999 onwards. The years 1995 to 1998 are added for the Integrated NAMEA. The basic energy statistical data used for this is the data on which the energy accounts are also based.

Part of the consumption from 1995 to 1998 can be clearly assigned on the basis of available information to the relevant ÖNACE 2-digit code and to the private households institutional sub-sector. In cases where individual consumption is aggregated at a higher level, e.g. for mechanical engineering (ÖNACE 2003 2-digit codes 28-32), for other manufacturing sectors (ÖNACE 2003 2-digit codes 25, 28, 36, 37) or for public and private services (ÖNACE 2003 2-digit codes 41, 50-55, 63-93), it is disaggregated to ÖNACE 2-digit codes based on the breakdown in the energy accounts of 1999. Because of the model-based disaggregation it must be assumed that there is a certain degree of data imprecision for these years at 2-digit level, which does not however affect the published data because this data is at the original aggregation level. Disaggregation is required solely for internal data processing purposes.

The fuel consumption in land transport, consisting of petrol, diesel and biofuels, is viewed functionally in the energy balances. In other words, it is not assigned to the individual economic sectors and the private households institutional sub-sector but is instead recorded as consumption by the transport sector. On the other hand, in the energy accounts fuel consumption must be assigned according to the polluter pays principle. For the years 1995 to

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<sup>3</sup> As from reporting year 1999 the short-term statistics were replaced by the goods input statistics as a major data source for the preparation of the energy balances.

1998 this is performed for petrol and diesel based on the relevant breakdown for 1999. Biofuels are broken down using the average of petrol and diesel. The fuel consumption of each individual ÖNACE 2-digit code and the private households institutional sub-sector is then grouped together with the final energy consumption from the energy balances to arrive at overall consumption. Because of this model-based calculation it must be assumed that there is a certain degree of data imprecision for the years 1995 to 1998.

No further calculation steps are performed. The differences in the time series resulting from the differing system boundaries of energy balances and energy accounts are depicted with bridge tables.

For further details please refer to [Standard Documentation – Energy Accounts](#) (currently only available in English).

#### Environmental protection expenditure:

The data included in the Integrated NAMEA is already provided in the specified breakdown by economic sector and private households institutional sub-sector. No calculation steps are therefore needed. For further details please refer to the [Standard Documentation – Environmental Protection Expenditure Accounts](#) (in German).

#### Environmental taxes:

The data included in the Integrated NAMEA is already provided in the specified breakdown by economic sector and the private households institutional sub-sector. No calculation steps are therefore needed. For further details please refer to the [Standard Documentation – Environmental Taxes](#) (in German).

#### Air emissions:

Air emissions are calculated by the Environment Agency Austria GmbH as a product of emission factors and emission-generating activities based on the [CORINAIR](#) system of the European Environment Agency (EEA) using the SNAP<sup>4</sup> classifications. They are included in the Austrian Air Pollution Inventory (AAPI), which is the basis for the international reporting obligations under UNFCCC and UNECE CLRTAP and uses the "domestic concept" of the environmental accounts whereas the NAMEA follows the "residence concept" (see section 2.1.11).

The energy balances of Statistics Austria provide an important data source for calculating emissions. CORINAIR differentiates at the highest aggregation level (SNAP level 1) eleven activities that are sources of major air emissions and are therefore designated as main emitter groups. These main emitter groups are broken down into 77 emitter sub-groups (SNAP level 2) and finally into approx. 400 processes (SNAP level 3). Each of these processes is assigned a six-digit code, the SNAP code.

Normally the SNAP codes refer to technological processes, although a few refer to economic activities where the technological process can be clearly assigned to one economic activity (e.g. the "cement kiln" process is the only process for the "cement manufacturing" economic activity). Since the description of the content of the activities is generally significantly wider than the ÖNACE classification, CORINAIR does not correspond to the breakdown of the economic data and therefore does not allow a direct link to the ÖNACE classification.

The SNAP processes must therefore be assigned to the economic divisions of the ÖNACE. With most SNAP codes this is not a problem as they can be assigned directly to an economic activity. The same applies to those emissions that relate to the private households institutional sub-sector. A more complex (indirect) method must be used where

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<sup>4</sup> Selected Nomenclature of Sources for Air Pollution

- multiple economic activities are grouped together under one SNAP process (e.g. coal mining, oil and gas production and pipeline compressors);
- non-process specific activities, e.g. combustion installations for space heating, need to be broken down;
- entire emitter groups contain no information for assignment to ÖNACE divisions, e.g. use of solvents, road traffic.

These processes are described as non-specific.

### **Assignment of non-specific emissions to the responsible parties**

The main step here consists of assigning emissions from activities (SNAP processes) to the individual economic sectors and the private households institutional sub-sector. In the case of non-specific processes this is performed using auxiliary variables and expert knowledge. Transport emissions are additionally adjusted in line with the "residence concept".

The following SNAP codes have to be assigned indirectly.

- 020103: Combustion installations < 50 MW in the service sector
 

These are emissions from the operation of space heating in service industries. The assignment is performed using the useful energy analysis (UEA) and the breakdown of the labour force in full-time equivalences to individual industries.
- 030103: Combustion installations < 50 MW in the manufacturing sector
 

Based on the information in the Austrian Air Pollution Inventory, non-specific combustion processes in the manufacturing sector can to some extent be assigned directly to the iron and steel manufacturing industries, the chemical and petrochemical industries, the paper and cardboard industries and the food, drink and tobacco industries. The remainder is assigned based on energy consumption data from the useful energy analysis, the sectoral federal province transformation balances<sup>5</sup> and the energy accounts. To this end a percentage distribution, on the basis of which these air emissions are assigned, is created with the aid of physical energy consumption data for each energy source across the entire remaining manufacturing sector.
- 040618: Use of limestone and dolomite
 

Emissions are assigned to the most important responsible parties with the support of experts from the Environment Agency Austria. ÖNACE 2003 2-digit codes 21, 24, 26, 27 and 40 as well as ÖNACE 2008 2-digit codes 17, 20, 23, 24 and 35 are used.
- 050103: Storage of solid fuels (coal)
 

Emissions are assigned to users of coal, lignite, lignite briquettes and coke based on the useful energy analysis, the sectoral federal province transformation balances and the energy accounts.
- 060108: Other industrial paint applications
 

Emissions are assigned using the breakdown of the labour force in full-time equivalences to ÖNACE 2003 2-digit codes 17-19, 21, 22, 24-27, 29-33, 35 and 36 / ÖNACE 2008 2-digit codes 13-15, 17-18, 20-24, 26-28, 30-32.
- 0604: Fireworks
 

There is no data regarding how the use of fireworks is assigned to private and commercial users. It has therefore been decided to use the pragmatic approach of assigning the emissions equally to the private households institutional sub-sector and the ÖNACE 2003 2-digit code 92 (Culture, sport and entertainment)/ÖNACE 2008 2-digit code 93

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<sup>5</sup> See Bittermann (2010c)

(Performance of sport, entertainment and recreation services) in which pyrotechnicians are classified.

➤ 0701-0705: Emissions from road vehicles

Traffic emissions must be adjusted to the rules of the "residence concept". The method used for road transport is shown in graphic form in Figure 4. It is based on the consumption of petrol, diesel and biofuels from the energy accounts. This represents the consumption that can be assigned to domestic institutional units. To these values are added the differences from energy balances minus energy accounts<sup>6</sup>. These are those amounts that cannot be assigned to domestic institutional units. The percentage breakdown thus derived is used to assign the road transport emissions from the AAPI to domestic institutional units and to the "rest of the world". The name for this item is based on the assumption that those emissions not caused by domestic institutional units must come from foreign institutional units.

➤ 0706: Fuel evaporation

The emissions from fuel evaporation are assigned to domestic institutional units with the same percentage breakdown as petrol.

➤ 0707: Attrition from tyres and brakes

There is no precise data for attrition from tyres and brakes, which is why the assignment is made based on the vehicle population with no consideration of vehicle type or driving behaviour.

Figure 4: Calculation of road transport emissions according to the residence principle

Consumption of petrol, diesel and biofuel from EnerA	+ Difference from EB
Percentage distribution	
Emissions of dom. inst. units	Road transport emissions "Rest of world"

Source: In-house diagram.

➤ 0805: National and international air transport

In principle the same approach is used for air transport as for road transport, i.e. the emissions are adapted from the domestic principle to the residence principle. In contrast to road transport, however, the energy consumption of domestic aviation companies was higher than the domestic sales of aviation fuel in most years investigated since high volumes were bought abroad. The emissions are therefore in general higher than in the Air Pollution Inventory. A simple method (see Figure 5) is used for the calculation in which the consumption of aviation fuel from the energy accounts<sup>7</sup> is weighted with an emission factor.

<sup>6</sup> In the years under review the figures for road transport were consistently higher in the energy balances than in the energy accounts, whereby it should again be noted that the energy accounts were extended specifically for the Integrated NAMEA to include the years 1995-1998 and the associated time series discontinuities have a certain amount of data imprecision.

<sup>7</sup> For information regarding the expansion of the energy accounts to include the years 1995-1998 see Section 2.6.

Figure 5: Calculation of aviation transport emissions according to the residence principle

Consumption of aviation fuel from EnerA	x	Emission factor
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Source: In-house diagram.

➤ 090208: Combustion of waste oil

The emissions are assigned based on information from relevant experts from the Environment Agency Austria to ÖNACE 2003 2-digit codes 26 (Manufacture of glass and glass products, Manufacture of non-metallic mineral products) and 90 (Sewage and refuse disposal, sanitation and similar activities) / ÖNACE 2008 2-digit codes 23 (Manufacture of glass and glass products, Manufacture of non-metallic mineral products) and 38 (Waste collection, treatment and disposal activities; materials recovery).

➤ 091001: Waste water treatment in industry

Here emissions are also assigned to the most important responsible parties with the support of experts from the Environment Agency Austria. These are ÖNACE 2003 2-digit codes 15 (Manufacture of food products and beverages), 20 (Manufacture of wood products, except furniture) and 21 (Manufacture of pulp, paper and paper products) / ÖNACE 2008 2-digit codes 10 (Manufacture of food products and beverages), 16 (Manufacture of wood and of products of wood and cork, except furniture) and 17 (Manufacture of pulp, paper and paper products).

In the Austrian Air Pollution Inventory a distinction is made between inland navigation and international navigation. The corresponding share of emissions from inland navigation is assigned to inland navigation.

When interpreting the data series, attention needs to be paid to time series discontinuities. These are based primarily on the discontinuities for energy consumption. In addition, the years 1996 to 1999 are not available for particulate matter (PM10).

Similarly to energy consumption, the differences in time series for air emissions that result from the differing system boundaries of the AAPI and air emissions accounts are shown by means of bridge tables.

### Non-inclusion

➤ 060508 Other use of HFC, N<sub>2</sub>O, NH<sub>3</sub>, PFC & SF<sub>6</sub>

Only N<sub>2</sub>O emissions occur under this code. These emissions cannot be assigned to responsible parties, which is why they are not included in the Integrated NAMEA.

For the purposes of reporting to Eurostat, air emissions are assigned to the individual ÖNACE 2-digit codes as well as to the private households institutional sub-sector. In the Integrated NAMEA they are currently not published to this level of detail but in accordance with the structure of the energy balance.

#### Hazardous and non-hazardous waste:

The data is provided by the Environment Agency Austria separated into hazardous and non-hazardous waste. A comparative analysis of hazardous waste over time is not possible within the Integrated NAMEA. The reasons for this are firstly that its breakdown into individual economic sectors differs up to 2004 from those of the Integrated NAMEA. The other reason why it is not possible is because of changes to the statutory regulations for the classification of hazardous waste and for the exemption of hazardous waste (verification of non-hazardous nature) as well as the resulting time series discontinuity. Data for the time period 1998 to 2010 as well as 2012 is available.

Non-hazardous waste is analysed by the Environment Agency Austria at two-year intervals and data is available only for the years 2004, 2006, 2008, 2010 and 2012. As with hazardous waste

the breakdown of sectors in 2004<sup>8</sup> differs from the Integrated NAMEA, which makes comparison impossible.

Because of the different classifications waste data is considered separately and is not directly compared with other developments at the level of the economic sectors.

It should also be noted that data from the annual waste balance notifications (in accordance with the Waste Balance Regulation (Federal Law Gazette II No. 497/2008)) was used by the Environment Agency Austria for the first time for reporting year 2010 for the analysis of the volume of waste. The volume of waste was displayed aggregated according to the economic sector categories of the EC Waste Statistics Regulation. A more detailed breakdown by ÖNACE category (e.g. 2-digit code) is not possible. The reason for this is that data transfers from waste producers for each federal province and each economic sector category of the EC Waste Statistics Regulation can be reported collectively in the annual waste balance notifications.<sup>9</sup>

As of 2010 the chemicals and petrochemicals economic sector therefore includes volumes that should actually be assigned to the Other Manufacturing sector. This particularly affects the "Manufacture of rubber and plastic products" sector. Mechanical engineering includes waste from the vehicle construction sector so that no waste can be assigned for vehicle construction. In addition the iron and steel manufacturing industries contain part of the mechanical engineering volume. The Other Manufacturing sector includes volumes from the "Repair and installation of machinery and equipment" sector, which in previous periods were reported under Public and Private Services. The waste volumes from transport (land transport, inland navigation and air transport) are included in Public and Private Services.

### **2.2.7 Other quality assurance measures**

The results of this project are presented to the contracting entity in the form of a project report. This is checked by the contracting entity – with assistance from outside experts – to ensure the various technical requirements are met and then officially accepted in accordance with the contract.

The concept, any problems arising during the work and planned amendments are discussed in regular (monthly) project group meetings with the contracting entity. The contracting entity and Statistics Austria both have the right to invite outside experts to these project group meetings.

The on-going work and planned amendments are presented to and discussed with the contracting entity, special interest groups, data users and experts in an annual meeting with the Environment Advisory Committee. Recommendations from the Advisory Committee are – as far as is possible and feasible – taken into account.

The professional development of staff and the implementation of new methodological approaches are ensured by participation in workshops and working parties (Eurostat).

## **2.3 Publication (accessibility)**

### **2.3.1 Preliminary results**

Are not published.

### **2.3.2 Final results**

The air emissions accounts as part of the Integrated NAMEA have been published since 2010 in September and the complete Integrated NAMEA in December, both t+2, i.e. data for 2012 is available in 2014.

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<sup>8</sup> The data can be found in the structure of the EU Waste Statistics Regulation.

<sup>9</sup> See Environment Agency Austria (2012c)

### **2.3.3 Revisions**

Partial results are revised in the form of back calculations if revisions are made within the basic statistics.

### **2.3.4 Publication media**

The results are published in the following publication media of Statistics Austria:

Internet:

[Statistics Austria website – Environment](#)

[Statistische Nachrichten](#) (in German only)

The results are also provided to the contracting entity in the form of a project report.

### **2.3.5 Treatment of confidential data**

The confidentiality of the data is ensured by two measures.

First, the data is aggregated at Austria level. Second, economic sectors are grouped together if required to ensure the confidentiality of the data.

## **3. Quality**

### **3.1 Relevance**

Statistics are relevant if user needs can be optimally met.

To this end, the Integrated NAMEA is the subject of an annual Environment Advisory Committee meeting at which ongoing work and planned amendments are discussed with the contracting entity, interest groups, data users and experts. As far as is possible and feasible, any suggestions (regarding both content-related and publication-related aspects) are taken into account in the calculations.

The method underlying the Integrated NAMEA is also internationally agreed and was discussed and further developed in working groups and workshops at Eurostat.

The data in the Integrated NAMEA is used for the following purposes:

- Information about the effects of social activity on the environment and the internalisation of external effects (payment of environmental protection expenditure and environmental taxes). This data is used not just by the contracting entity but also by university and non-university research institutes.
- Reporting to Eurostat on air emissions from domestic institutional units within the air emissions accounts (part of the Integrated NAMEA)

### **3.2 Accuracy**

#### **3.2.1 Sampling effects**

No data is collected in conjunction with the Integrated NAMEA, which is why the reader is referred to the relevant basic statistics for information on sampling effects and/or the representativeness of the data.

#### **3.2.2 Non-sampling effects**

As a statistical analysis, the Integrated NAMEA depends on the availability and quality of the basic data used.



As mentioned elsewhere, environmental and economic systems have different aims and objectives and therefore differ in their structure. In order to link these different systems with each other, a classification is needed that can be used across all modules of the Integrated NAMEA.

This link is the classification of data according to [ÖNACE](#) divisions and groups. Unfortunately, there are problems associated with this.

In the recording of air emissions it should be noted that SNAP describes only those activities that contribute significantly to air pollution, i.e. not all economic activities are recorded. In addition, the description of the content of the activities is generally significantly wider than the ÖNACE classification, which means that CORINAIR does not correspond to this breakdown of economic data and therefore does not allow a direct link to the ÖNACE classification. Although, however, most SNAP processes can be directly assigned to ÖNACE economic divisions and groups, with some a more complex procedure must be used (see also the relevant details in point 2.2.6). This means that there is a certain degree of imprecision here.

In respect of hazardous waste, it should be noted that data has only been available from 1998 onwards and has only been included in the structure of the Integrated NAMEA since 2005. In terms of non-hazardous waste, only data for the years 2004, 2006, 2008, 2010 and 2012 is available and only the data for 2006, 2008 and 2010 can be aggregated in the structure of the Integrated NAMEA. For the foreseeable future non-hazardous waste will continue to be collected and be able to be included in the Integrated NAMEA only in a two-year rhythm. Furthermore, there is also a time series discontinuity for waste because of changes in the statutory regulations for the determination of hazardous waste as well as for the exemption of hazardous waste (verification of non-hazardous nature). For these reasons waste has only a very limited degree of comparability with the other modules of the Integrated NAMEA in most of the years under review.

It should also be noted that the data from the annual waste balance notifications (in accordance with the Waste Balance Regulation (Federal Law Gazette II No. 497/2008)) was used by the Environment Agency Austria for the first time for reporting year 2010 for the analysis of the volume of waste. The volume of waste was displayed aggregated according to the economic sector categories of the EC Waste Statistics Regulation. A more detailed breakdown by ÖNACE category (e.g. 2-digit code) is not possible. The reason for this is that data transfers from waste producers for each federal province and each economic sector category of the EC Waste Statistics Regulation can be reported collectively in the annual waste balance notifications.<sup>10</sup>

From 2010 on the chemicals and petrochemicals economic sector therefore includes volumes that should actually be assigned to the Other Manufacturing sector. This particularly affects the "Manufacture of rubber and plastic products" economic sector. Mechanical engineering includes waste from the vehicle construction sector so that no waste can be assigned for vehicle construction. In addition the iron and steel manufacturing industries contain part of the mechanical engineering volume. The Other Manufacturing sector includes volumes from the "Repair and installation of machinery and equipment" sector, which in previous periods were reported under Public and Private Services. The waste volumes from transport (land transport, inland navigation and air transport) are included in Public and Private Services.

A further requirement is compatibility with the system of National Accounts (NA), which specifically means analogous classifications, definitions and boundaries/categorisations of the different sectors. However, a number of special features also need to be met to comply with the purpose of a NAMEA, e.g. that private households should only be considered as consumers and therefore not as an ÖNACE 2-digit code but as an institutional sub-sector.

Therefore the ÖNACE 2003 divisions 95 (Private households as employers of domestic personnel), 96 (Undifferentiated goods-producing activities of private households for own use) and 97 (Undifferentiated service-producing activities of private households for own use) /

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<sup>10</sup> See Environment Agency Austria (2012c)

ÖNACE 2008 divisions 97 (Private households as employers of domestic personnel) and 98 (Undifferentiated goods-producing and services-producing activities of private households for own use) are not included in the Integrated NAMEA.

According to the "residence concept", division 99 (Extra-territorial organisations and bodies) is also not taken into account.

It should also be noted that as from reporting year 1999 the short-term statistics were replaced by the goods input statistics as a major data source for the preparation of the energy balances. Therefore for reasons of consistency the energy accounts only start at 1999. Energy consumption for the years 1995-1998 was assigned to the economic sectors and the sub-sector private households as far as possible in accordance with the methodology of the energy accounts. In terms of biofuels the data situation improved significantly from 2005 onwards. There is also a certain amount of data imprecision for the years 1995 to 2004.

It should also be noted that in terms of environmental protection expenditure both in the protection of ambient air and climate environmental sectors and in the waste management sector no data is available for ÖNACE 2003 economic sectors 60 (Land transport; transport via pipelines) and 61 (Navigation). In the construction sector (ÖNACE 2003 2-digit code 45) there are no relevant figures for the years 1999 to 2002. According to ÖNACE 2008, these are economic sectors 41, 42, 43, 49 and 50.

The same applies to particulate matter PM10 for the years 1996 to 1999.

### **3.2.2.1 Quality of data sources used**

Internal: For information about the quality of data sources used, please refer to the relevant basic statistics.

In respect of the data from the National Accounts (gross value added, production value, labour force in full-time equivalences), relevant experts are only consulted during preparation of the Integrated NAMEA where there are particularly irregular issues. The data for the other internal components (energy accounts, material flow accounts etc.) is checked for inconsistencies during the processing process for the Integrated NAMEA and challenged if necessary.

External: The good quality of data from external, officially published data sources (Environment Agency Austria GmbH) may be assumed; nevertheless, the data is "checked" for any inconsistencies and irregularities while it is being used and data producers are questioned if necessary. This may occur, for instance, where data suppliers perform revisions that are not explicitly notified at data transfer.

### **3.2.2.2 Coverage (misclassifications, undercoverage / overcoverage)**

Misclassifications may occur in relation to the indirect assignment of air emissions to the economic sectors and the private households institutional sub-sector and in relation to the extension of the energy accounts to the years 1995 to 1998. This is because these assignments are made using ancillary variables and expert knowledge since no complete and/or exact data is available.

SNAP code 060508 – Use of other solvents – is not taken into account in the Integrated NAMEA since no information is available for assignment to the economic sectors and the private households institutional sub-sector. The percentage volume of nitrous oxide (N<sub>2</sub>O) emitted – the sole air pollutant under this SNAP code – in relation to total emissions is very low so this non-inclusion should have no effect on the overall results.

### **3.2.2.3 Missing responses (unit non-response, item non-response)**

No data is collected within the Integrated NAMEA. The reader is therefore referred to the relevant basic statistics for information on unit/item non-response.

### **3.2.2.4 Measurement errors (entry errors)**

No data is measured or collected in conjunction with the Integrated NAMEA. The reader is therefore referred to the relevant basic statistics for information regarding measurement errors (entry errors).

### **3.2.2.5 Processing errors**

None known.

### **3.2.2.6 Model assumption effects**

Model calculations are performed in the indirect assignment of SNAP codes, in the assignment of environmental taxes, material input and environmental protection expenditure and in the extension of the energy accounts to include the years 1995 to 1998. The resulting level of imprecision cannot be assessed. No other model calculations are performed.

## **3.3 Timeliness and punctuality**

The data from the environmental protection expenditure accounts is not available until t+2 (the federal government, federal provinces and municipalities are important data sources and their performance data is not published until the budget proposals of the next but one period). The Integrated NAMEA is therefore also based on t+2.

To provide more up-to-date data, the air emissions accounts (part of the Integrated NAMEA) have been published in September (t+18) since 2010. The data from the Austrian Air Pollution Inventory (AAPI) published by the Environment Agency Austria is fully available towards the end of the first quarter. The preparation of the air emissions accounts is then started.

The results of the NAMEA are sent in a timely manner, i.e. by 31.12 of the calendar year, to the contracting entity based on the conditions of the contract with the Federal Ministry of Agriculture, Forestry, Environment and Water Management.

## **3.4 Comparability**

### **3.4.1 Comparability over time**

The NAMEA time series mainly begin in 1995 and currently go up to 2012. There are the following exceptions:

- Data exists for environmental protection expenditure from 1997 onwards (exceptions are the ÖNACE 2003 2-digit codes 45, 60 and 61 / ÖNACE 2008 2-digit codes 41 to 43, 49 and 50; see point 3.2.2).
- Data for hazardous waste is available for the period 1998 to 2010 and 2012.
- Data for non-hazardous waste is available for the years 2004, 2006, 2008, 2010 and 2012.
- Data for PM10 and PM2.5 are not available for the years 1996 to 1999.
- Up until 2007 the ÖNACE 2003 classifications are used, from 2008 the ÖNACE 2008 version is used. Since economic sectors are not considered at ÖNACE 2-digit level but are in most cases aggregated instead (see [Annex 1](#), in German), it should be assumed that comparability over time is only slightly impaired. To ensure comparability over time, the ÖNACE 2008 2-digit codes 37 (Sewage disposal), 38 (Waste collection, treatment and disposal activities; materials recovery) and 39 (Elimination of environmental pollution and other disposal activities) that primarily correspond to ÖNACE 2003 2-digit code 90 (Sewage and refuse disposal, sanitation and similar activities) continue to be assigned to public and private services and not, as envisaged in the ÖNACE 2008 classification, treated in the manufacturing sector.

### 3.4.2 Comparability over region

The data is published at Austrian level. In order to ensure international comparability, a method that is standard across Europe is used. Because of the voluntary nature of the material flow accounts, energy accounts, air emissions accounts, NAMEA waste data, environmental protection expenditure accounts and environmental tax accounts at European level, it is not possible to ensure comparability with all members of the European statistical system.

### 3.4.3 Comparability over other domains

Comparability by economic sector is ensured by the use of ÖNACE classifications. The only exception is hazardous and non-hazardous waste up to 2004 because its structure deviates from the structure of the Integrated NAMEA and subsequently the aggregation cannot be changed.

### 3.5 Coherence

No coherence check is performed in conjunction with the Integrated NAMEA.

## 4. Outlook

#### Production-related aspects:

No changes are envisaged in the foreseeable future.

#### Content-related aspects:

As of the reporting year 2013, the European System of Accounts 2010 will be used.

Changes with regard to the publication media used are not envisaged in the foreseeable future. Adjustments with regard to the published reports, tables and graphics are not ruled out. They would be based primarily on content-related changes.

## Glossary

**Ammonia (NH<sub>3</sub>):** Ammonia is an air pollutant that has an acidifying and eutrophic effect. Acidification results in a lowering of the pH levels of soils and bodies of water; eutrophication (over-fertilisation) leads to the excessive input of nitrogen into ecosystems.

**Biomass:** This is defined as the volume of all organic matter of biogenic, non-fossil origin. Biomass comprises materials living and growing in nature and resultant waste materials, as well as living and dead organic mass. The material flow accounts include the volume of biomass that is removed from the nation's environment and enters the production system, as well as imported biomass. Since livestock production by definition takes place within the production system, it is not considered as biomass.

**Carbon dioxide (CO<sub>2</sub>):** Carbon dioxide is a greenhouse gas. It contributes to the greenhouse effect by absorbing infra-red radiation released from the ground, which stops it being released into the atmosphere.

**Carbon dioxide (CO<sub>2</sub>) from biogenic sources:** Carbon dioxide from biogenic sources comes from the combustion of biofuels (renewable energy). These emissions are deemed to be climate-neutral, i.e. not damaging to the environment, as they are reabsorbed by renewable raw materials and therefore do not place an additional burden on the atmosphere. This applies only, however, if the combustion of renewable raw materials does not exceed the volume of their regeneration.

**Carbon dioxide (CO<sub>2</sub>) from fossil sources:** Carbon dioxide from fossil sources comes from the combustion of non-renewable energy sources.

**Carbon dioxide (CO<sub>2</sub>) from other sources:** Carbon dioxide from other sources includes all emissions from non-energy processes.

**Carbon monoxide (CO):** Carbon monoxide is an ozone precursor substance from which ozone is formed in atmospheric layers close to the ground under the effects of sunlight.

**Dinitrogen monoxide (N<sub>2</sub>O):** Dinitrogen monoxide (nitrous oxide) is a greenhouse gas. It contributes to the greenhouse effect by absorbing infra-red radiation released from the ground, which stops it being released into the atmosphere.

**labour force :** According to the regulations of the ESA, the labour force includes all persons who furnish the supply of labour for productive activities as employees (salaried and waged employees, public servants, part-time workers and soldiers) or as self-employed persons or family workers, irrespective of the scope of this activity. Persons with multiple simultaneous employment relationships are only recorded once with their main employment.

**labour force in full-time equivalences:** This figure is calculated by dividing the volume of work of economically active persons (= amount of hours actually worked by the labour force within the production boundaries of the ESA) by the number of employment relationships in normal working hours. In this calculation the volume of work is divided by the number of hours normally performed on average per full-time job in the relevant ÖNACE 2-digit code.

**Emission-relevant non-renewable energy sources:** These are those fossil fuels whose combustion causes climate-damaging carbon dioxide emissions, e.g. coal, lignite, lignite briquettes, fuel peat, coke, other refinery inputs, petrol, petroleum, diesel, gas oil for heating purposes, fuel oil, liquid gas, other oil processing products, refinery residual gas, natural gas, blast furnace gas and coke oven gas.

**Emission-relevant renewable energy sources:** These are those biogenic, non-fossil, energy sources whose combustion causes climate-neutral carbon dioxide emissions, e.g. biofuels, combustible waste and firewood. These emissions are not deemed to be damaging to the climate as they are reabsorbed by renewable raw materials and therefore do not place an additional burden on the atmosphere. This applies only, however, if the combustion of renewable fuels does not exceed the volume of their regeneration.

**Energy consumption:** This is calculated from the final energy consumption, transformation input of the economy, energy sector consumption and transport losses of natural gas, coke oven gas and blast furnace gas. The Integrated NAMEA differentiates between emission-relevant non-renewable, emission-relevant renewable, non-emission-relevant renewable and other non-emission-relevant energy sources and crude oil.

**Energy sector:** This comprises the totality of ÖNACE divisions 10 (Mining of coal and lignite), 11 (Extraction of crude petroleum and natural gas as well as associated services), 40 (Energy supply) as well as ÖNACE groups 23.1 (Coke oven products), 23.2 (Manufacture of refined petroleum products) and 23.3 (Manufacture of nuclear fuel).

**Environmental protection expenditure:** This encompasses all expenditure on measures and activities the goal of which is to prevent, reduce and eliminate environmental pollution or other forms of environmental damage. The methodological basis is SERIEE, the European System for the Collection of Economic Data on the Environment. Expenditure in the environmental domains "Protection of ambient air" and "Climate protection" as well as in the "Waste management" environmental domain is taken into account in the context of the Integrated NAMEA.

**Final energy consumption:** This represents that volume of energy provided to the consumer for conversion into useful energy (room heating, lighting, IT, mechanical work etc.) and is calculated from the gross domestic consumption minus the balance from transformation input and output as well as minus the consumption of the "energy sector" and non-energy consumption.

**Fluorinated gases (F gases):** Fluorinated gases are greenhouse gases. They contribute to the greenhouse effect by absorbing infra-red radiation released from the ground, which stops it being released into the atmosphere. They are subdivided into partially halogenated

chlorofluorohydrocarbons (HFCs), fully halogenated chlorofluorohydrocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>).

**Fossil materials:** These are the volumes of oil, natural gas, coal and peat taken from the natural environment and flowing into the production system as well as imported volumes of such materials, plus petroleum products, chemical products and plastic products.

**Gross value added at basic prices (chain-linked volumes based on previous year's prices):** Comprises compensation of employees, depreciation/write-downs, other taxes on production minus other production subsidies (= net taxes on production) and operating surplus/mixed income. The gross value added values of individual economic sectors are assessed at the previous year's prices (chain-linked volumes) in order to eliminate price effects.

**Material inputs:** These are all the volumes of biotic, fossil and mineral materials taken from the natural environment and flowing into the production system, as well as imported volumes of biotic, fossil and mineral materials.

**Methane (CH<sub>4</sub>):** Methane is an ozone precursor substance and a greenhouse gas. As an ozone precursor substance it forms ozone in atmospheric layers close to the ground under the effects of sunlight. As a greenhouse gas, methane contributes to the greenhouse effect by absorbing infra-red radiation released from the ground, which stops it being released into the atmosphere.

**Mineral materials:** These are all the volumes of metal ores and non-metallic minerals taken from the natural environment and flowing into the production system as well as imported products subsumed under this group.

**Mononitrogen oxides (NO<sub>x</sub>):** Mononitrogen oxides are ozone precursor substances that form ozone in atmospheric layers close to the ground under the effects of sunlight.

**Non-emission-relevant renewable energy sources:** These are those renewable, non-fossil energy sources that do not cause air emissions, e.g. ambient heat etc., hydropower, wind and photovoltaic energy.

**Other non-emission-relevant energy sources:** These are those secondary fuels whose use does not give rise to air emissions, e.g. district heating, electrical energy.

**Particulate matter:** Particulate matter is a component of the fine particle fraction, i.e. particulate matter which passes through a size-selective inlet with a 50 % efficiency cut-off at 10 µm aerodynamic diameter (PM<sub>10</sub>) or at 2.5 µm aerodynamic diameter (PM<sub>2.5</sub>).

**Production value at basic prices (chain-linked volumes based on previous year's prices):** This represents the value of all goods produced during the accounting period, including those goods and services that one local kind-of-activity unit supplies to another local kind-of-activity unit belonging to the same institutional unit, and those goods that are still in inventories at the end of the period, irrespective of their subsequent use. The production values of the individual economic sectors are assessed at the previous year's prices (chain-linked volumes) in order to eliminate price effects.

**Sulphur dioxide (SO<sub>2</sub>):** Sulphur dioxide is an air pollutant that has an acidifying effect. Acidification causes a reduction in the pH level of soils and bodies of water.

**Transformation input:** This refers to that volume of fuel that is used for the creation of secondary fuel products as well as for the generation of electricity and heat.

**Volatile organic compounds excluding methane (NMVOC):** These are ozone precursors from which ozone is formed under the effects of sunlight. Some of these substances have direct health consequences.

**Waste:** This refers to movable items that the owner wishes to dispose of, or has disposed of, or whose recording and treatment as waste is in the public interest.

## List of abbreviations

AAPI	Austrian Air Pollution Inventory
BMLFUW	Federal Ministry of Agriculture, Forestry, Environment and Water Management
BS 68	Betriebssystematik 1968 (old economic classification system used in Austria)
CEPA	Classification of Environmental Protection Activities
CH <sub>4</sub>	Methane
CO	Carbon monoxide
CORINAIR	CORe INventory of AIR emissions
CO <sub>2</sub>	Carbon dioxide
CN	Combined nomenclature
EnvA	Environmental accounts
EnerA	Energy accounts
EB	Energy balances
ESA 95	European System of Accounts 1995
EU	European Union
EUA	European Environment Agency
Eurostat	Statistical Office of the European Union
F gases	Fluorinated greenhouse gases (industrial gases)
HFC	Partially halogenated chlorofluorohydrocarbons
IFF	Faculty for Interdisciplinary Research and Continuing Education at the Alpen Adria University of Klagenfurt Vienna Graz
IO table	Input-output table (financial/physical)
NA	National Accounts
NACE	Nomenclature générale des activités économiques dans les Communautés Européennes (European system of classification of economic sectors)
NAMEA	National Accounting Matrix including Environmental Accounts
NH <sub>3</sub>	Ammonia
NMVOC	Volatile organic compounds excluding methane
NO <sub>x</sub>	Mononitrogen oxides
N <sub>2</sub> O	Dinitrogen monoxide (nitrous oxide)
OECD	Organisation for Economic Co-operation and Development
ÖNACE	Austrian version of NACE
PFC	Fully halogenated chlorofluorohydrocarbons
PM10	Particulate matter
PM2.5	Particulate matter
PRODCOM	Inventory of products of the European Community "PRODUCTION COMMUNAUTAIRE"
SERI	Sustainable Europe Research Institute
SERIEE	Système Européen pour le Rassemblement des Informations Economiques sur l'Environnement (European System for the Collection of Economic Information on the Environment, Europäisches System umweltbezogener Wirtschaftsdaten)

SF <sub>6</sub>	Sulphur hexafluoride
SNAP	Selected Nomenclature for sources of Air Pollution
SO <sub>2</sub>	Sulphur dioxide
UEA	Useful energy analysis
UNECE CLRTAP	United Nations Economic Commission for Europe Convention on Long-range Transboundary Air Pollution
UNFCCC	United Nations Framework Convention on Climate Change

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## **Annexes**

*Links to the following sub-documents are contained in this standard documentation:*

[Breakdown of economic sectors in the Integrated NAMEA \(ÖNACE 2003 and ÖNACE 2008\)](#) (in German)

[List of environmental taxes](#) (in German)