

## Demonstration Indicator Fact Sheet

### (WEU8) Emissions of organic matter

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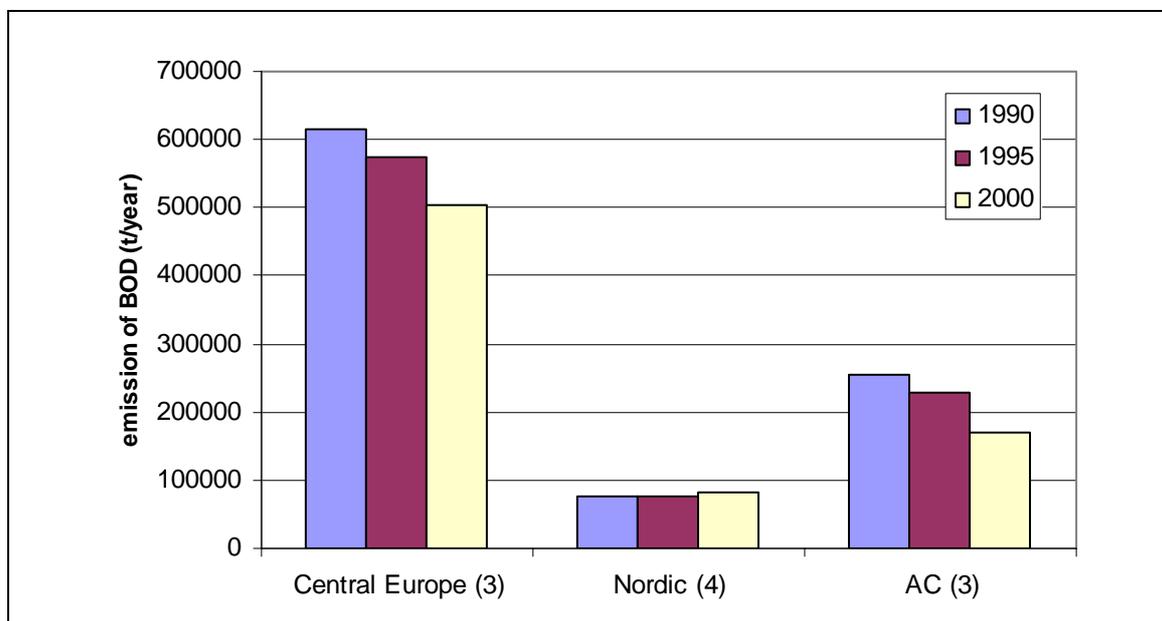
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#### Key message

😊 Organic pollution discharges to water in Central Europe and in the Accession countries have significantly decreased since the 1990s.

🔴 However the quantities emitted are still high and still represent a high pressure on the aquatic environment.

**Figure 1: Changes in organic matter emissions from all sources in regions of Europe between 1990 and 2000.**



Notes: Only countries with data from all periods included, the number of countries in parentheses.

Nordic: Norway, Sweden, Finland, Iceland.

Central Europe: England & Wales and Northern Ireland, Netherlands and Switzerland.

AC: Estonia, Hungary and Czech Republic

Sources: EEA – ETC/WTR based on Member States data reported to OECD / EUROSTAT Joint Questionnaire 2002.

#### Results and assessment

Policy relevance:

The emission of organic matter is a key environmental problem. Various Directives targeted to one or more anthropogenic activities address this: the Urban Waste Water Treatment Directive (UWWT) for waste water, Integrated Pollution Prevention and Control (IPPC) for large industries, Water Framework Directive (WFD) for all sources. This indicator describes the trends in emission of organic pollution between various regions.

Policy context:

The need for estimations of organic pollution emission and pressure is emphasised in the WFD (2000/60/EC) through the requirements for identification of trends in pollutants, of emissions and pressures. Estimations have to be carried out at the River Basin District level for point and diffuse source pollution influences on the water status. Among the pollutants mentioned, there are:

*“Substances which have an unfavourable influence on the oxygen balance (and can be measured using parameters such as BOD, COD, etc.).”*

These substances are generally designated as organic pollution or organic matter.

Biochemical Oxygen Demand (BOD) and Chemical Oxygen Demand (COD) are also key parameters of the UWWT Directive (91/271/EEC), and Total Organic Carbon (TOC) is a parameter of the IPPC (96/61/EEC).

Environmental context:

BOD, COD and TOC are key indicators of the oxygen content of water. The pressure on the environment caused by discharges from urban waste water treatment plants can be estimated by reporting the quantities of discharges emitted into the environment over a year, estimated through measurements at the point of discharge or other methods applying, for example, emission factors, and including data on non-connected and scattered population, industrial effluents and agricultural runoff, if available. High levels indicate a high pressure on water quality that may have the effect of reducing the biodiversity of aquatic communities and reducing microbiological quality.

Assessment:

Since the 1940s, in most European countries, the increase of industrial and agricultural production and connection to sewerage has resulted in an increase of discharge to water of organic waste. Over the last twenty years, marked changes have occurred in the proportion of the population connected to waste water treatment as well as in the waste water treatment technology involved (see factsheet WEU16 Urban waste water treatment). In many major European rivers, oxygen levels decreased and the ecological quality was heavily affected. During the 1990s, the BOD levels improved by 20 to 30 % in the rivers of both the EU and Accession Countries (see factsheet WEU2 Nutrients, BOD and ammonium in rivers). More recently, improvements have been made in rural (autonomous) waste water treatment in the EU.

Data availability is very heterogeneous, depending on the number of Member States who reported data for the year concerned. Based on available data, mean BOD emissions have decreased in the past ten years in the EEA area. The slight upward trend in Nordic countries is due to transfers from diffuse sources (not taken into account in the indicator) to point sources. This trend suggests that urban domestic pressure, as for organic water pollution, is lessening (or decreasing) but the situation in the EEA area is mixed.

The trend observed is in accordance with the last SoE report of the EEA (§ 3.5 Water Stress, p168) assessing that the reduction of urban organic water pollution is to be linked to the improvement of sewage treatment technology. The decrease in the emission of organic pollution is mainly due to improvements in the level of treatment, which leads in turn to an increase in the quantities of sludge produced. The sludge has to be disposed of, mainly through spreading on soils, deposits in landfills or incineration that can result in pollution transfers from water to soil or air.

## References

2000/60/EC. Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. [Water Framework Directive]. [http://www.europa.eu.int/comm/environment/water/water-framework/index\\_en.html](http://www.europa.eu.int/comm/environment/water/water-framework/index_en.html)

2000/479/EC Commission decision 2000/479/EC of 17 July 2000 on the implementation of a European Pollutant Emission Register (EPER) according to Article 15 of Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC)

96/61/EC Council Directive 96/60/EC of 24 September 1996 concerning the integrated pollution prevention and control (IPPC Directive)

91/271/EEC Council Directive 91/271/EEC on urban wastewater treatment  
<http://europa.eu.int/comm/environment/water/water-urbanwaste/directiv.html>

EUROSTAT / OECD Joint questionnaire 2002

EUROWATERNET-Emissions working database

EEA, 1999, Environment in the European Union at the turn of the century,  
[http://reports.eea.eu.int/92-9157-202-0/en/tab\\_content\\_RLR](http://reports.eea.eu.int/92-9157-202-0/en/tab_content_RLR)

## Spreadsheet file:

WEU8-OM-V3.xls

## Meta data

### Web presentation information

#### 1. Abstract / description / teaser:

Shows the trends in total emissions of organic polluting substances in Europe's regions.

#### 2. Policy issue / question:

Are discharges of organic substances and nutrients decreasing?

#### 3. EEA dissemination themes:

Water

#### 4. DPSIR:

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### Technical information

#### 5. Data source:

The information used has been compiled from EUROWATERNET emissions working Waterbase. The database include data collected from public official sources or provided on a voluntary basis and processed to fit to the requirements of the database. Only data from Eurostat were used in the figures : EUROSTAT / OECD Joint questionnaire 2002, theme 3 table demography (population data) and theme 8 table 4 and 7.

#### 6. Description of data:

Annual discharges from urban wastewater treatment plants.

#### 7. Geographical coverage:

For this illustration, data are only available for a maximum of 10 out of the 31 countries for EEA area.

#### 8. Temporal coverage:

1970 to 2001.

#### 9. Methodology and frequency of data collection:

In sensitive areas of EU countries, UWWT plants discharges should not exceed a yearly mean concentration of 25 mg/l of O<sub>2</sub>. A yearly survey has to be made by water policy authorities to control the conformity.

10. Methodology of data manipulation, including making 'early estimates':  
The data used are emissions directly reported by Member States to Eurostat. When data are not available, this is replaced by estimations. These estimations (used here) are obtained by the following method : emission factor of 60g BOD per day and inhabitant, average of percentages connected to each treatment type, weighted by total population in each country and average performance of the 3 types of wastewater treatment plants.  
Quality information
11. Strength and weakness (at data level):  
The treatment types are only coarse indications of the level of purification. The estimation do not take into account the variations in the definitions of different classes of treatment between countries, and the real performance of the plants. Furthermore data are not provided on a regular basis by countries for all years. However, the methodology is reliable enough to provide an EEA overview.
12. Reliability, accuracy, robustness, uncertainty (at data level):  
Data are collected from and validated by national statistical offices, this guaranty comparability over time but not over space between countries. Only the Netherlands provide emissions data on a regular basis, for other countries the estimation is used. reducing uncertainty is possible only if countries complete the past series and report more data on wastewater treatment.
13. Overall scoring (give 1 to 3 points: 1=no major problems, 3=major reservations):  
Relevancy: 1  
Accuracy: 2  
Comparability over time: 1  
Comparability over space: 2

**Further work required**

Future improvements in the data collection process of EUROSTAT, especially completion of time series for data on waste water treatment, and possibly on emissions and emission factors, will improve the quality of information and geographical coverage. It will thus especially allow for the apportionment of emission of organic matter between the various sources involved. On a long term basis more information could be obtained from future reports and works of the Commission (UWWTD, WFD, PRTR).