working draft

EEA Core Set of Indicators - CSI 024

Urban waste water treatment

May 2005 assessment

draft

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European Environment Agency

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Key policy question: How effective are existing policies in reducing loading of nutrients and organic matter?

Key message: Wastewater treatment in all parts of Europe has improved significantly since the 1980s, however the percentage of population connected to waste water treatment is relatively low in southern and eastern Europe, and in the Accession countries.

Over the last twenty years, marked changes have occurred in the proportion of the population connected to wastewater treatment as well as in the wastewater treatment technology involved. The Urban Waste Water Treatment Directive has largely accelerated this, providing deadlines and mandatory levels of treatment for all discharged wastewaters. This has also contributed significantly to the general improvement of surface water quality including bathing waters. Member States have made considerable investments to achieve these improvements but most of them are however late in applying the Directive or have interpreted the Directive differently from the Commission.

In northern countries most of the population are today connected to wastewater treatment plants with tertiary treatment, which efficiently removes nutrients (phosphorus or nitrogen or both) and organic matter from the wastewater. In the central Europe countries more than half of the wastewater is treated by tertiary treatment. Southern and Eastern countries and the Accession countries only have around half of the population connected to wastewater treatment plants at the moment. 30 to 40 % of the population are connected to secondary or tertiary treatment.

These changes have resulted in improvement of the state of water bodies with a decrease in concentration of orthophosphates, total ammonium and organic matter over the past ten years. For nitrate however no clear trend can be found at a national level though at the monitoring station level a decrease in concentration can be found at some stations. In the EU15 these decreases are linked with the implementation of European legislation. In the Eastern Europe (new Member States) and in the Accession Countries decreases are due to the general increase in the level and extent of waste water treatment and because of the recession associated with the transition to market-oriented economies (see WEU2).

A secondary threat to the environment comes from the disposal of the produced sewage slude. The increase in the proportion of the population connected to waste water treatment, as well as in the level of treatment, leads in turn to an increase in the quantities of sewage sludge produced. This sludge has to be disposed of, mainly through spreading on soils, to landfills or by incineration: these disposal routes can transfer pollution from water to soil or air and have to be taken into account in the respective policy processes.

Using the longest time period available allows for the development of time series and time trend analysis. Many countries have not reported their data to EUROSTAT for each year in the time series and so comparisons at the European level are difficult. Countries have therefore been grouped to show the relative contribution of each country to the trend and the incomplete nature of the data. The data and time trends are most complete for Western Europe and the Nordic countries and least complete for the Southern European and Accession countries, with the exception of Estonia and Hungary.

The Nordic countries and Western Europe have the highest levels of tertiary treatment of wastewater whilst the Southern European and Accession countries have the lowest levels, although data are

incomplete for the latter two country groupings. This is because policies to reduce eutrophication and to improve bathing water quality have been implemented earlier in the Nordic and Western European countries than in Southern European and Accession Countries.

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

98/15/EC Commission Directive 98/15/EC of 27 February 1998 on amendments to Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment , http://europa.eu.int/comm/environment/water/water-urbanwaste/amendment.html

91/271/EEC Council Directive 91/271/EEC of 21 May 1991 concerning urban wastewater treatment http://europa.eu.int/comm/environment/water/water-urbanwaste/directiv.html

EUROSTAT / OECD Joint questionnaire 2002

Implementation of Council Directive 91/271/EEC of 21 May 1991 concerning urban waste water treatment, as amended by Commission Directive 98/15/EC of 27 February 1998, http://europa.eu.int/comm/environment/water/water-urbanwaste/report/report.html

Summary report on the identification of sensitive areas by the Member States, the measures implemented by the Member States with the view to the deadline of 31 December 1998 regarding wastewater treatment in major cities, verification of the identification of sensitive areas by the Commission, http://europa.eu.int/comm/environment/water/water-urbanwaste/report2/report.html

http://www.fao.org/ag/AGL/aglw/aquastat/main/index.htm

OECD ENVIRONMENTAL PERFORMANCE REVIEW

UNECE report

National Statistical offices and SoE reports (http://www.grida.no/enrin/htmls/) >

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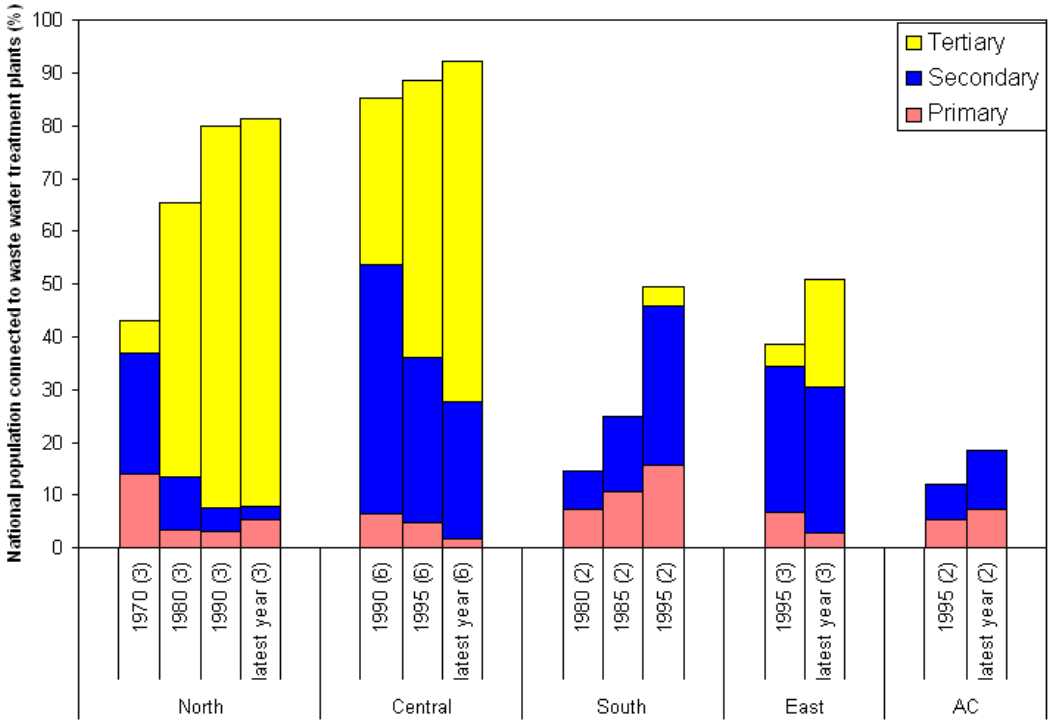
Fig. 1: Changes in wastewater treatment in regions of Europe between 1980s and late 1990s



Data source: EEA-ETC/WTR based on Member States data reported to OECD/EUROSTAT Joint Questionare 2002

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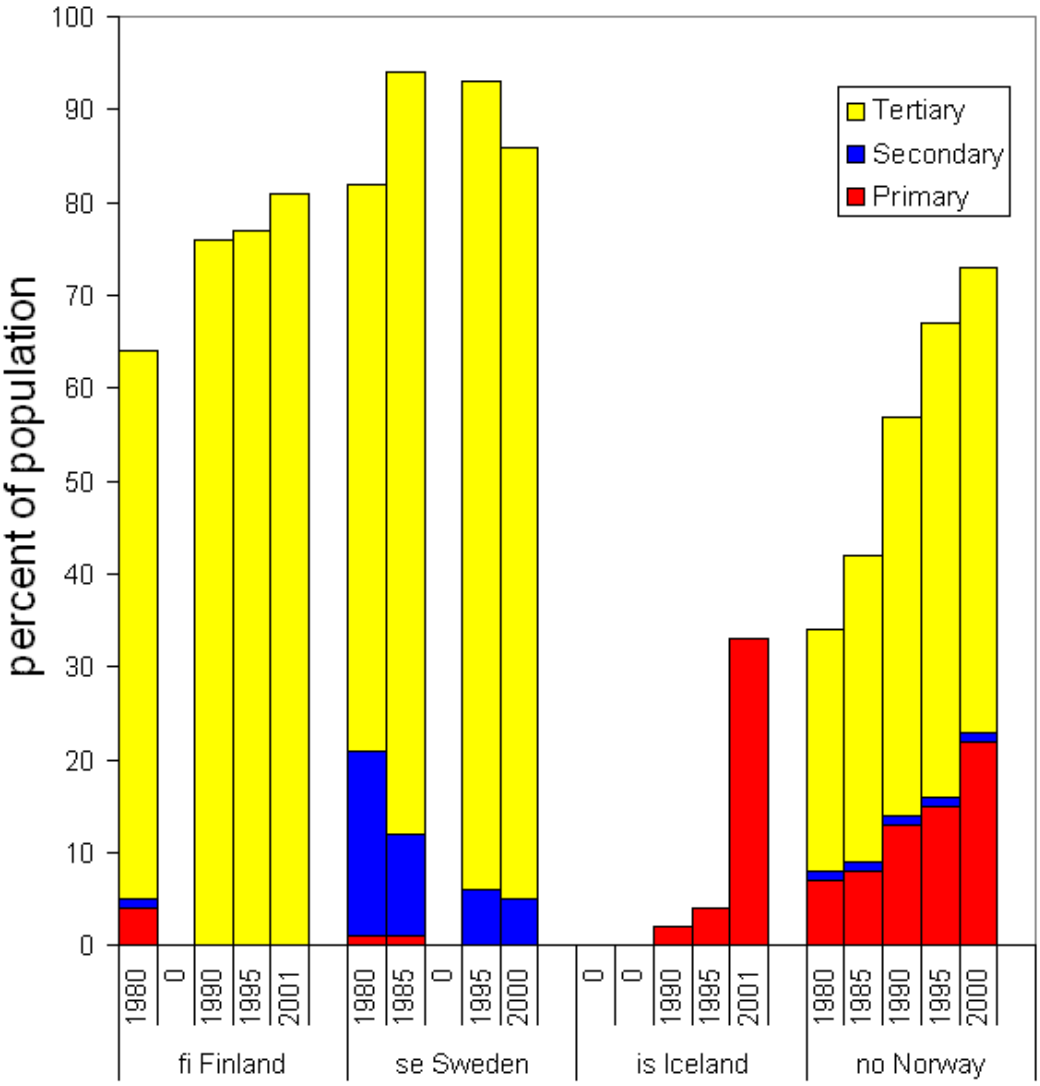
Fig. 2: Changes in wastewater treatment in countries of Europe between 1980s and late 1990s (Nordic)



Data source: EUROSTAT Newcronos
Note: Only countries with data at least for one year reported here

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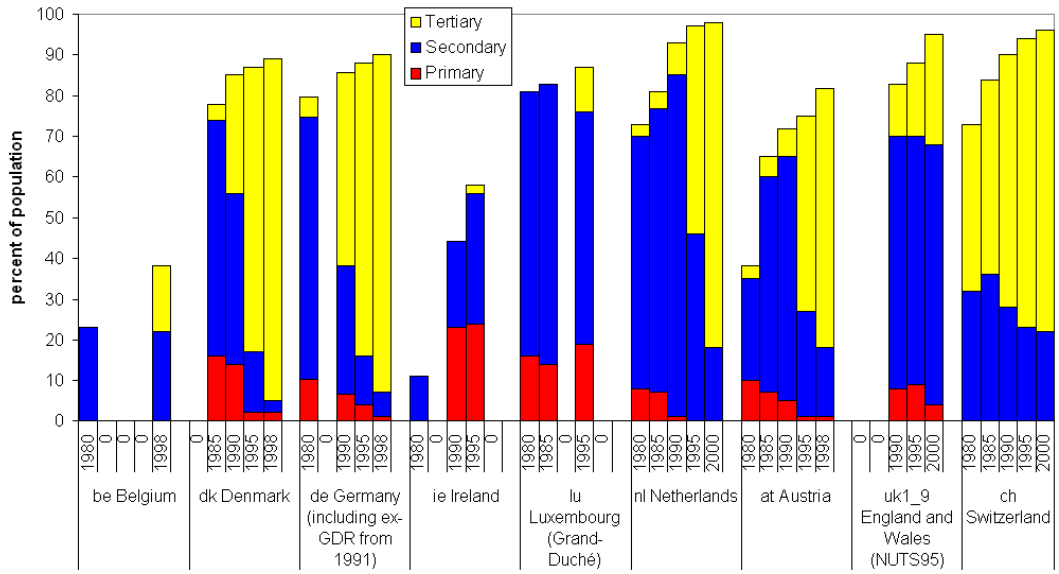
Fig. 3: Changes in wastewater treatment in countries of Europe between 1980s and late 1990s (Western)



Data source: EUROSTAT Newcronos
Note: Only countries with data at least for one year reported here

Fig. 4: Changes in wastewater treatment in countries of Europe between 1980s and late 1990s (East)

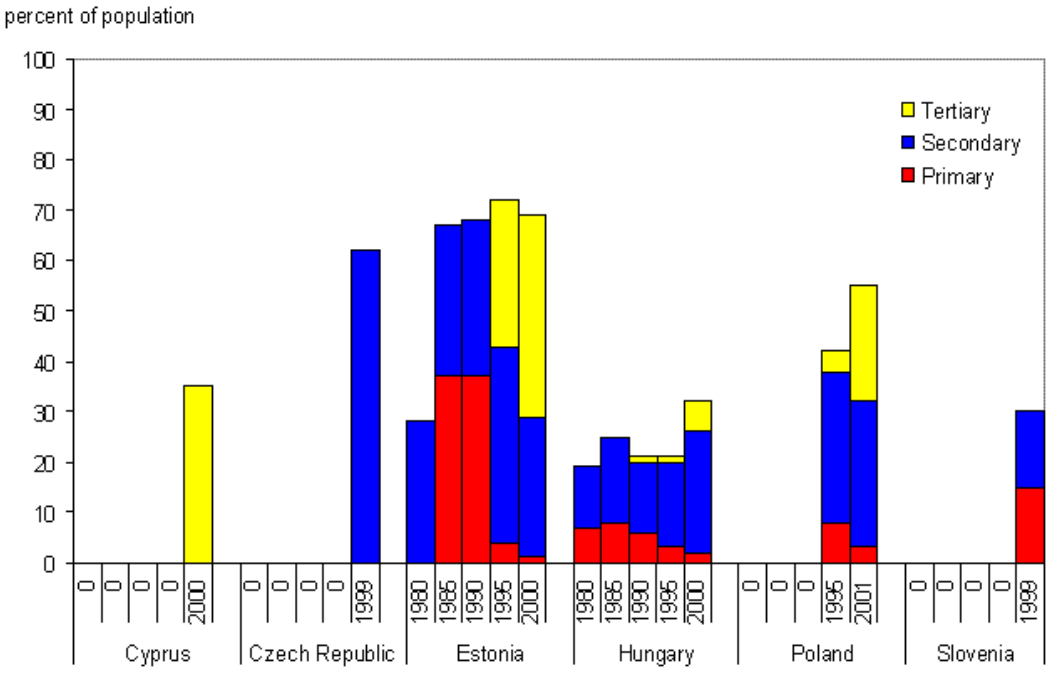


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Fig. 5: Changes in wastewater treatment in countries of Europe between 1980s and late 1990s (AC)

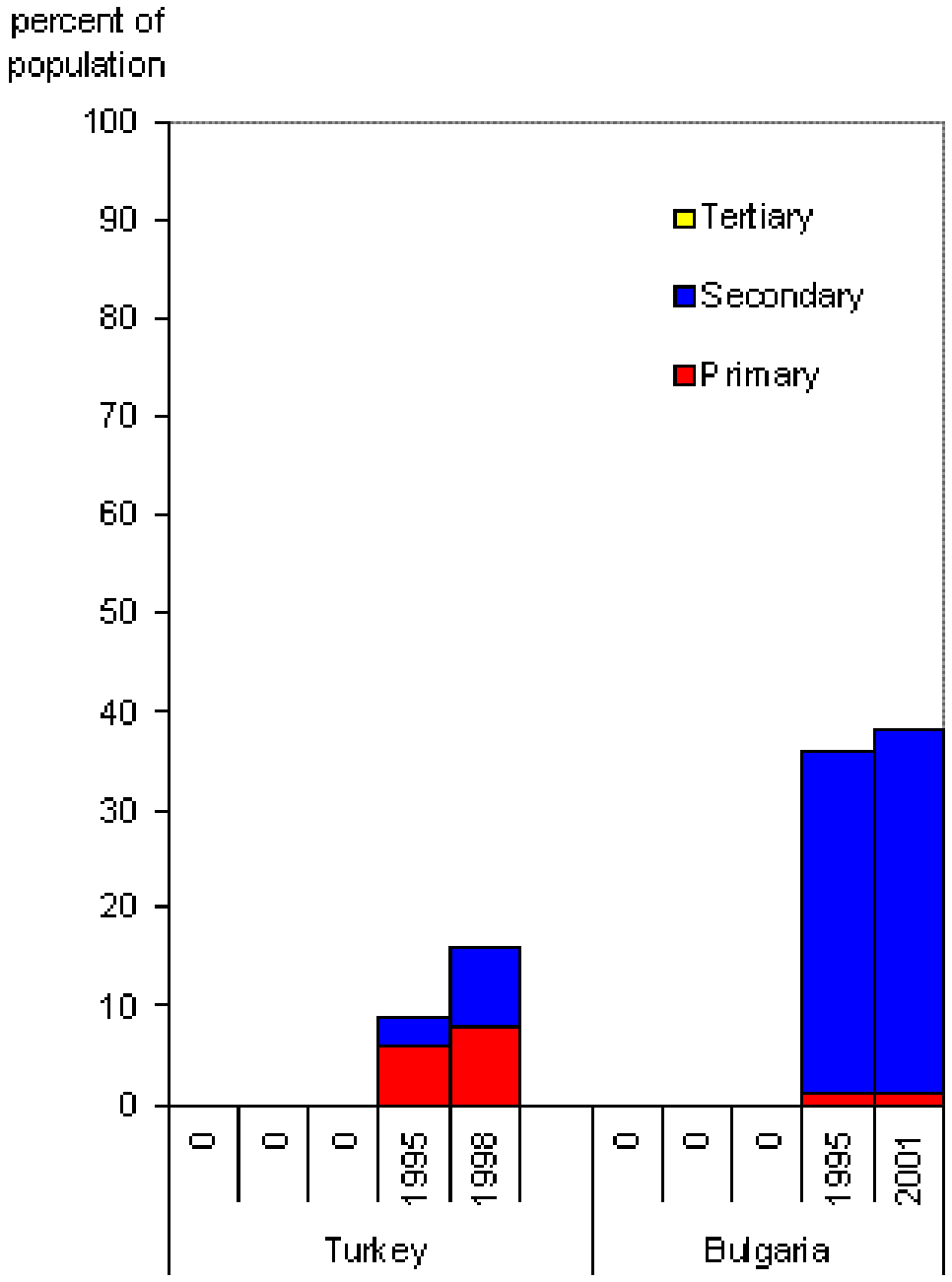

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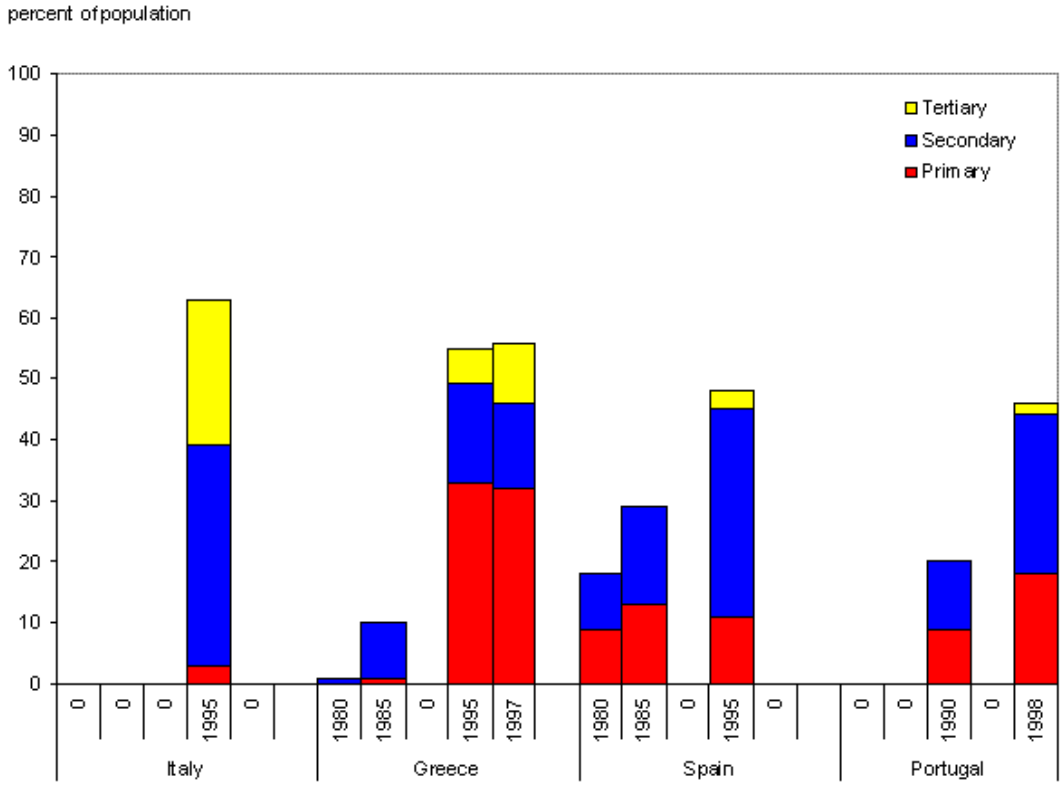
Fig. 6: Changes in wastewater treatment in countries of Europe between 1980s and late 1990s (Southern)



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Specific policy question: Is the Urban Waste Water Treatment Directive (91/271/ECC) being implemented in Member States?

Only 2 EU countries were close to conforming to the requirements of the UWWT Directive regarding their large agglomerations discharging into sensitive areas by the end of 2001 and 158 of the 526 cities with population equivalents greater than 150 000 did not have a sufficient standard of treatment by the end of 2001 to meet the objectives of the UWWT Directive.

The Urban Waste Water Treatment Directive (UWWTD) requires Member States to identify water bodies as sensitive areas in accordance with defined criteria such as the risk of eutrophication occurring. Member States were required to ensure that wastewater treatment facilities with tertiary treatment were available to all agglomerations with a population equivalent greater than 10 000 by 31 December 1998 where their effluent was being discharged into a sensitive area or its catchment. The European Commission (EC 2002) has published a report on Member States conformity with this requirement and another report including updates of these data in 2004.

For large cities with population equivalents greater than 150 000, Member States were required to provide more advanced (than secondary) treatment by 31 December 1998 for discharges into sensitive areas, and at least secondary treatment by 31 December 2000 for those discharging into 'normal' waters.

However, by the end of 2001, many of the 526 such cities did not have a sufficient standard of treatment of which 67 in normal areas, 91 in sensitive areas and with a lack of reporting data for 11. Moreover 25 agglomerations had no treatment at all, including Milan, Cork, Barcelona or Brighton. The situation has however greatly improved, partly due to better reporting to the Commission, partly due to real improvements in the treatments and some of the cities now conform made the necessary investment in 1999-2002, the others plan to complete work soon.

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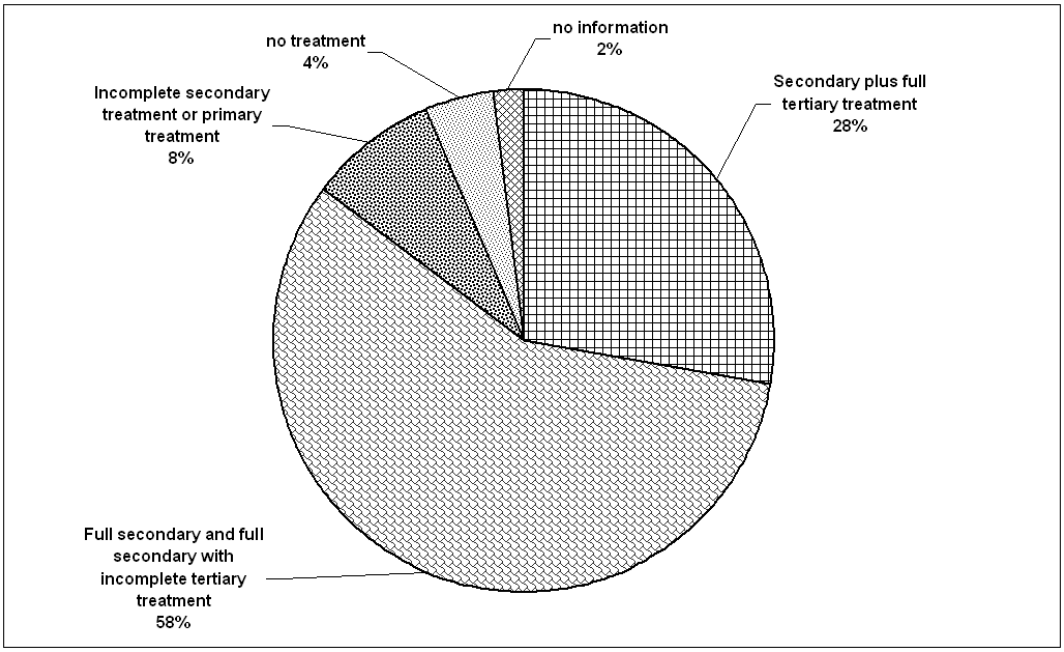
Fig. 7: Number of EU15 agglomerations of more than 150 000 p.e. by treatment level, situation on 1st January 2002.



Data source: DGENV 2004

Note: 169 of the 526 cities with population equivalent more than 150 000 did not have a sufficient standard of treatment on 1st of January 2002 to meet the objectives of the UWWT Directive. 25 had no treatment at all including Milan, Cork, Barcelona or Brighton. No information are available on 11 cities. Since 1998 plans have been put into place to improve the situation in those cities with no treatment and incomplete treatment.
% load = organic load

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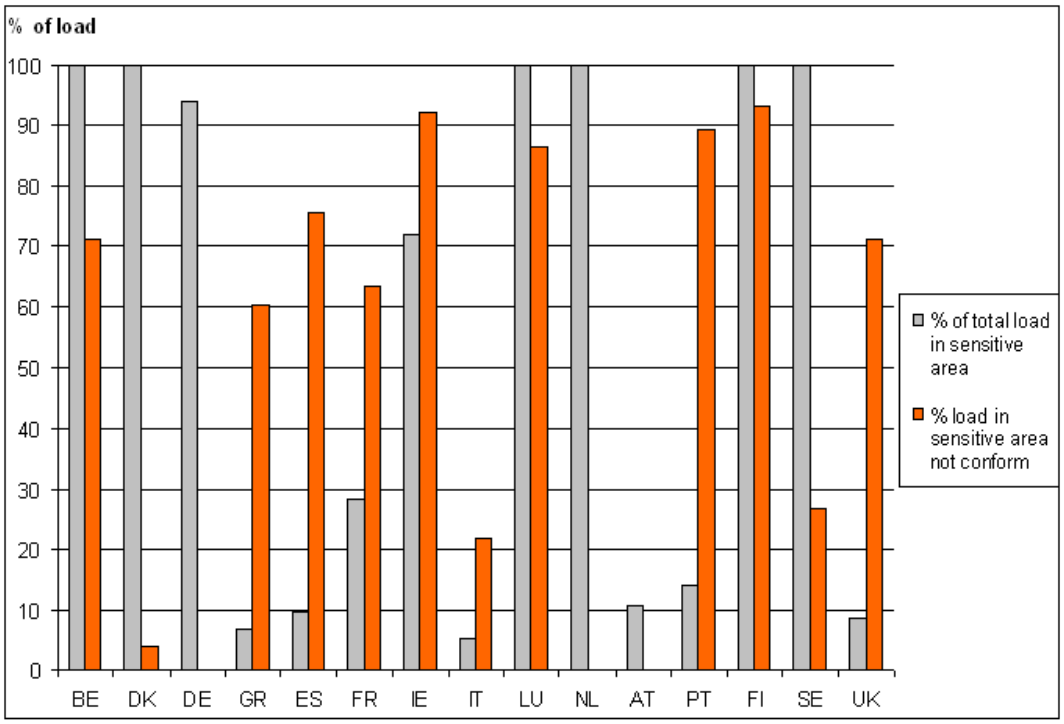
Fig. 8: Percentage of total load in sensitive area, and percentage of load in sensitive area not conforming, by country, as required by the Urban Waste Water Treatment Directive, 2001



Data source: DGENV 2004

Note: DE and NL have designated their whole territory as a sensitive area, but are not in conformity with the goal of 75% reduction of N. Of the 13 other EU Member States only 2 Member States (Denmark and Austria) were considered by the European Commission to be almost in conformity with the Directive's requirements. All other Member States were considered not to be in conformity.