

# Statistics on Waste Water Generation, Treatment and Discharge in Germany

By Birgit Hein  
Statistisches Bundesamt,  
Germany

## 1.1. Introduction

The current ongoing German statistics on water and wastewater are based on the law for environmental statistics of 1994. The data provide important information to get a general view on Germany's wastewater situation. Furthermore, these data are needed for analyses of specific questions. The relevance of these data constantly increases in terms of international reporting during last years, especially for the needs of the Joint Questionnaire and the Water Framework Directive. One of the major advantages is the availability of data at different regional levels like Nuts 2 or River basin districts.

The statistics on water and wastewater belong to the oldest environmental statistics. They are carried out since the fifties and had been revised several times in order to adapt to changing needs. In 1974 the statistics were modified and new statistics had been developed (in the field of production of electricity and accidents with water-endangering materials). The latest adjustment dates from the mid-nineties. Again the system were extended by two statistics, one for the agricultural sector and the other one for plants to handle water-endangering materials.

Today the following data collections are used for describing the situation of waste water in Germany:

- Statistic on public water supply and urban waste water disposal (§ 6 UStatG),
- Statistic on water use and waste water disposal by manufacturing industry (§ 7 UStatG),
- Statistic on water use and waste water disposal by production of electricity (§ 9 UStatG)

## 1.2. Structure and contents of the waste water statistics

The German wastewater situation is dominated by two areas: the disposal of wastewater generated by the domestic and the industrial sector per central urban plants (sewerage and treatment) and the disposal of waste water by the industry itself. Accordingly, the data

collection consists of two parts: the urban wastewater collecting systems and treatment and the industrial wastewater generation and treatment.

#### a) Disposal of urban waste water

Since 1995 data collection in the area of urban waste water is carried out every three years, before the periodicity was four years.

In the collection procedure, four different questionnaires are used. Data for non-connected population and independent systems come from the municipalities. The other questionnaires are addressed to the operators of the urban waste water collecting systems and treatment plants.

6 P: independent waste water disposal	<ul style="list-style-type: none"> <li>- Population without connection to urban waste water collecting systems including connection to small sewage treatment plants and discharge less pits</li> <li>- Population connected to urban waste water collection systems without treatment</li> </ul>
6 S: urban sewerage	<ul style="list-style-type: none"> <li>- Kind, length and year of construction of the sewerage network</li> <li>- Number and storage volume of the sewage system for rainwater</li> <li>- Ways of transmission for the collected waste water including (volume)           <ul style="list-style-type: none"> <li>+ transmission to urban waste water treatment plants</li> <li>+ direct discharge into environment (including the location)</li> <li>+ transmission to industrial treatment plants</li> </ul> </li> <li>- Population connected to industrial treatment plants</li> </ul>
6 K: urban waste water treatment	<ul style="list-style-type: none"> <li>- Kind of waste water treatment: primary, secondary, tertiary treatment</li> <li>- Connected population (number and actual occupation in terms of inhabitant equivalents, BOD)</li> <li>- Design capacity in terms of inhabitant equivalents, BOD</li> <li>- Volume of waste water per year</li> <li>- Location of discharging into water bodies</li> <li>- Concentration of selective emissions</li> <li>- Number of plants and storage volume of the sewage system for rainwater</li> <li>- Sewage sludge production, treatment and disposal (tons of dry solids)</li> </ul>

#### b) Waste water disposal of the industrial sector

The periodicity is the same as the statistics mentioned above (a) and the structure of the questions is similar. The reports come from the mining and quarrying sector, the manufacturing industries and the enterprises for production and distribution of electricity.

In the collection procedure, two different questionnaires are used.

7 A / 9 A:	<ul style="list-style-type: none"> <li>- Origin of waste water (cooling or production processes)</li> </ul>
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Part IV Waste water generation and discharge	<ul style="list-style-type: none"> <li>- Transmission to           <ul style="list-style-type: none"> <li>+ urban waste water collecting systems and treatment plants</li> <li>+ own industrial treatment plants</li> <li>+ other external industrial treatment plants</li> </ul> </li> <li>- direct discharge into environment (including the location) and concentration of selective emissions</li> </ul>
7 B: Waste water treatment	<ul style="list-style-type: none"> <li>- Kind of waste water treatment primary, secondary, tertiary treatment and special procedures</li> <li>- Transmission to           <ul style="list-style-type: none"> <li>+ urban waste water collecting systems and treatment plants</li> <li>+ other external industrial treatment plants</li> </ul> </li> <li>- Transmission to another own industrial treatment plant</li> <li>- direct discharge into environment (including the location) and concentration of selective emissions</li> <li>- Sewage sludge production, treatment and disposal (tons of dry solids)</li> </ul>

## 2. International reporting on waste water, especially for the needs of the Joint Questionnaire (Eurostat/OECD)

The relevance of data on waste water constantly increases in terms of international reporting during last years. Nowadays the data requirements are focused on the OECD/Eurostat Joint Questionnaire. In the past, it was a problem that different international institutions required data and often these requirements were not coordinated. The implementation of the Joint Questionnaires solved this problem. It is used as a common database and today the international data requests are carried out more effectively.

Nevertheless in other fields coordination is still missing in the European Union itself, e.g. the Urban Waste Water Directive. It requires many data similar to the Joint Questionnaire. However, only the regional administrations (which are in Germany responsible for the waste water in the Länder) can do the reporting and not the statistical offices.

The Joint Questionnaire consists of four tables covering information on waste water. The structure is similar to the German statistic on waste water. Many of the demanded data can be delivered, primarily priority data. However there is a difference in the rate of delivery between the tables; depending upon the degree of detail. The following list supplies an overview.

Table 4: National population connected to waste water treatment plants	+ everything is available up to one position - not available: independent waste water collecting system including secondary treatment
Table 5: Treatment capacity, in terms of BOD for the different types of treatment	+ for the urban treatment plants most of the data are available excepting the effluents - for the other treatment plants and independent plants no data are available
Table 6: Sewage sludge production and disposal (volume and tons of dry solids) for the different types of treatment	+ for the urban treatment plants most of the data are available in tons of dry solids - but not in terms of volume - no data on independent treatment plants
Table 7: Part I - Volume Waste water generation by point sources (different sectors) and non point sources	+ data are available for most of the industrial sectors - no data from agricultural sector or construction sector - no data for non point sources
Waste water discharged by type of collecting system	+ most of the data are available - no delivery of data on waste water reused and for the detailed positions of waste water generated by the domestic sector
Table 7: Part II - BOD, COD, Suspended Solids, N-Tot, P-Tot, As, Population Equivalents, selected hazardous substances for the same classification than in part	- data are only available on effluents of urban treatment plants for COD, N-Tot und P-Tot

The delivery rate for table 4 to 6 is very high, particularly for data on the population connected to urban collecting systems and treatment plants. It applies to data on the capacity of urban plants. The situation for data on industrial plants is worse. There are data on types of treatment in the German statistics, but only for the number of enterprises and the volume of waste water. Because independent systems have no relevance (maximum 5 percentage), there exists no detailed data. For the first part of table 7, most of the required data are available. For the part II, which is very detailed, nearly no data can be supplied.

Germany is anxious to advance the delivery rate. Therefore, the statistical office of Germany presently accomplishes a project with the financial help of Eurostat. The aim is to develop

methods to estimate or to use other databases like Eper (European pollution emission register). Basis is the “Data Collection Manual for the OECD/Eurostat Joint Questionnaire on Inland Waters”.

### **3. Probleme**

Finally, there are many reasons affecting data supplies. On one hand the problems are due to the system of German water and waste water statistics. On the other hand, the structure of the Joint Questionnaire itself is a main reason.

#### **3.1 General problems**

- The law for environmental statistics is the basis for carrying out the waste water statistics with their current data content. For collecting new data a modification of the law is necessary. Nevertheless, international requirements are taken into account only if there is an international law, like the Regulation on Waste Statistics.
- One of the main problems is the distribution of the competences for water politics in Germany. Primarily water politics are in the hand of the 16 Länder while the federal government has only the right to give major guidelines. To fulfil their duties the administrations of the Länder themselves collect data on water and waste water, sometimes in parallel to the statistics mentioned above.  
Additionally the Commission requests data from the Länder, e.g. based on the urban waste water directive.
- In addition, there are other institutions collecting data about water and waste water management like the Umweltbundesamt or Eper (European Pollution Emission Register). In the result, there exist many different databases for waste water in Germany, but in general they are not coordinated and differ from each other.
- As data collection is done only every three years, timeliness is not optimally. Furthermore it is difficult to recognize new developments and integrate them in the Questionnaire right in time before the beginning of a new collection.
- The statistics on waste water are divided in two parts, but there exist overlapping parts like the treatment of urban waste water in industrial plants. For these fields it is often difficult to collect detailed data.

- Some sectors like agriculture animal husbandry, services or construction are not included in the waste water statistics. The water accounts try to estimate data for these sectors to provide a complete picture on the German waste water situation. Nevertheless, these data are still not integrated in the Joint Questionnaire.
- The German statistics have a long tradition and therefore it is difficult to modify the system, particularly an enlargement. Often those modifications are linked to large expenditures. In addition presently the political level plans to reduce the 'statistical' burden for enterprises, due to the bad economic situation.

b) Basierend auf dem Aufbau des JQ

- In some tables, particularly table 7, the questionnaires are very detailed. From a theoretical point of view, the data may be very interesting. However, it is not clear for which political reason these detailed data are needed.
- The discharge of waste water is in reality very complex and heterogenous. The more detailed the questions are the more difficult the data supplies becomes. Better results are obtainable by concentrating more on the major data.
- Table 7 orients itself on the sources of waste water, according to the waste water loading scheme. Nevertheless, the questionnaires themselves addresses to the enterprises, which are responsible for urban waste water treatment and discharge. Moreover, they normally could not differentiate between waste water generated by the domestic sector or by the industrial sector.
- Some definitions deviate from each other, e.g. cooling water/waste water. In the German statistics cooling water is defined as waste water, but it is not in the Joint Questionnaires.