# WATER QUALITY

*Water quality, closely linked to water quantity, is of economic, environmental and social importance. It has many aspects (physical, chemical, microbial, biological), and can be defined in terms of a water body's suitability for various uses, such as public water supply, swimming or protection of aquatic life. It is affected by water abstractions, by pollution loads from human activities (agriculture, industry, households), and by climate and weather. Pollution loads from diffuse agricultural sources are an issue in many countries, as is the supply of permanently safe drinking water to the entire population*

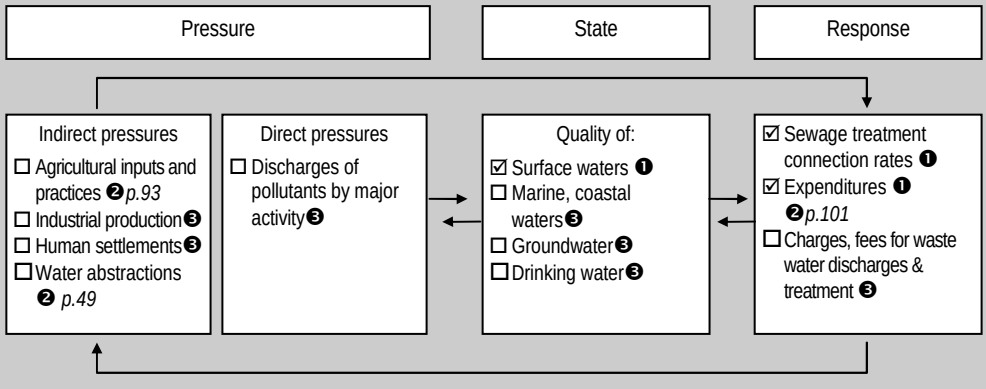
*If pressure from human activities becomes so intense that water quality is impaired to the point that drinking water requires ever more advanced and costly treatment or that aquatic plant and animal species in rivers and lakes are greatly reduced, then the sustainability of water resource use is in question. Performance can be assessed against domestic objectives and international commitments. At national level, countries have set receiving water standards, effluent limits and pollution load reduction targets for a range of parameters (e.g. oxygen, nutrients, micropollutants). In many cases, they are also committed to international agreements such as the OSPAR Convention on the Protection of the North-East Atlantic Marine Environment, the International Joint Commission Agreement on Great Lakes Water Quality in North America or the EU water directives. Protection of freshwater quality and supply is an important part of Agenda 21, adopted at UNCED (Rio de Janeiro, 1992) and of the Plan of Implementation adopted at the WSSD in Johannesburg (2002). The main challenge is to protect and restore all bodies of surface and ground water to ensure the achievement of water quality objectives, and to apply an integrated management of water resources based on the ecosystem approach.*

*Indicators presented here relate to:*

- *river water quality, presenting two parameters (oxygen and nitrate content) for selected rivers. Data are shown for representative sites at the mouth or downstream frontier, giving a summary view of the pollution load and clean-up efforts on the upstream watershed.*
- *waste water treatment, particularly sewage treatment connection rates, i.e. the percentage of the national resident population actually connected to public waste water treatment plants in the early 2000s. The extent of secondary and/or tertiary (chemical and/or biological) sewage treatment provides an indication of efforts to reduce pollution loads. It does not take into account private facilities, used where public systems are not economic. This indicator should be related to an optimal national connection rate taking into account national specificities such as population in remote areas. Sewerage connection rates and public expenditure on waste water treatment are given as supplementary information.*

**WATER QUALITY: ONGOING WORK AND REFERENCES**

♦ **OECD CORE SET AND RELATED INDICATORS**

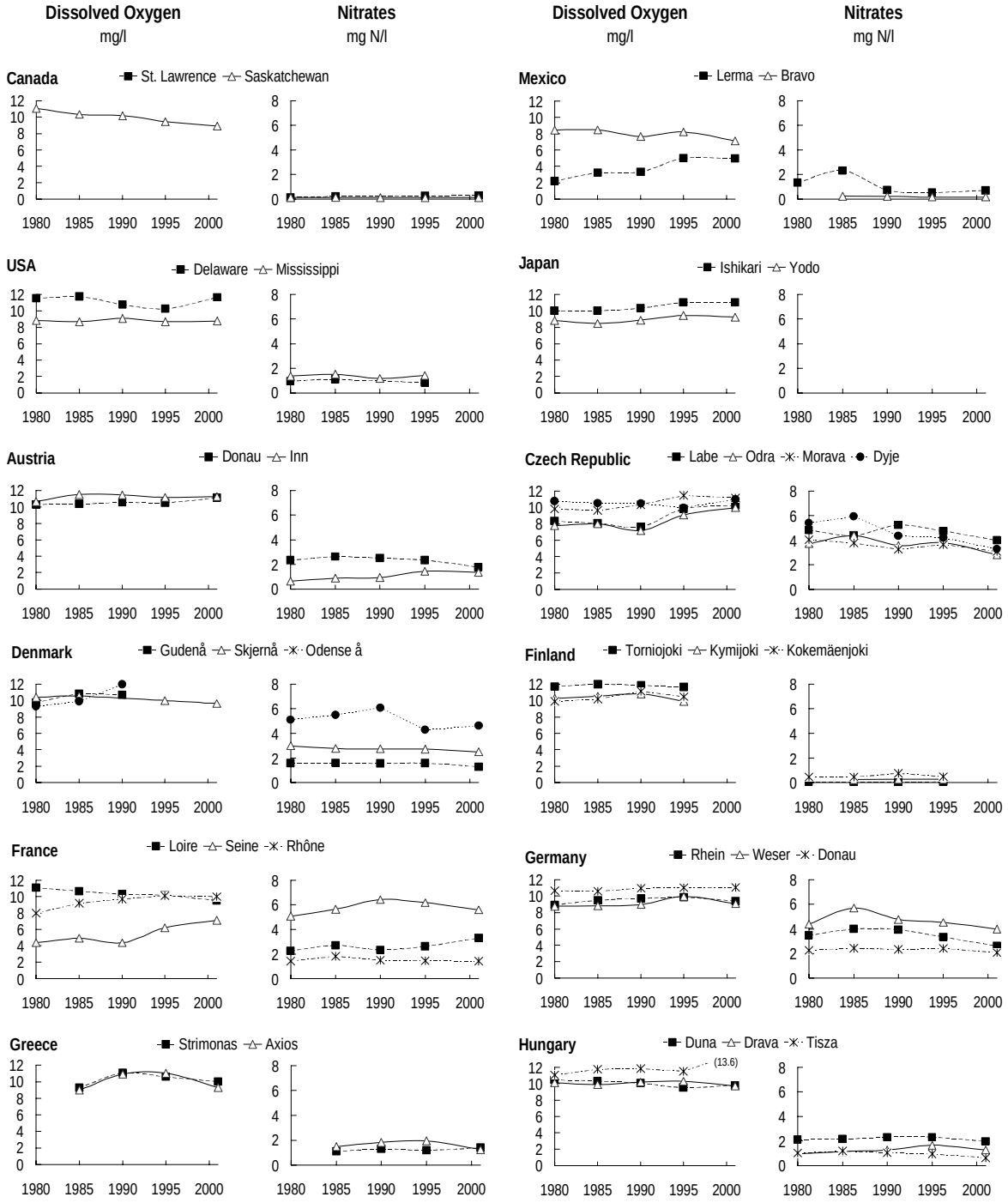



❶ *indicator presented here* ❷ *indicator presented elsewhere in this publication* ❸ *indicator not presented*

♦ **REFERENCES**

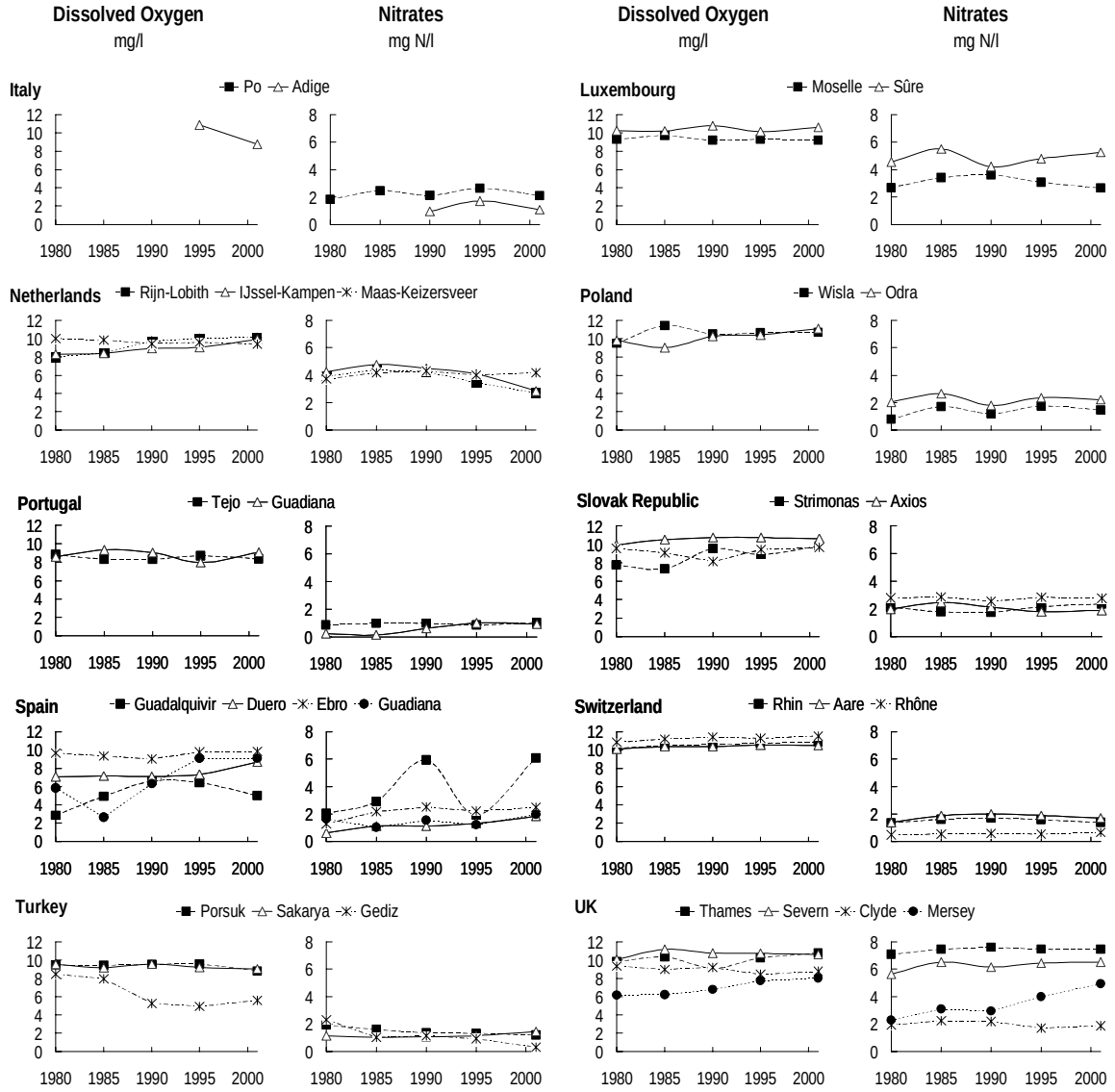

OECD (1998), Water Management: Performance and Challenges in OECD Countries
OECD (1997), Water Subsidies and the Environment
OECD (2001), OECD Environmental Outlook, Chapter 8, Freshwater
OECD (2004), OECD Environmental Data — Compendium 2004

## RIVER QUALITY 9




*Data refer to averages over three years of average annual concentrations. See Technical Annex for data sources, notes and comments.*

## 9 RIVER QUALITY



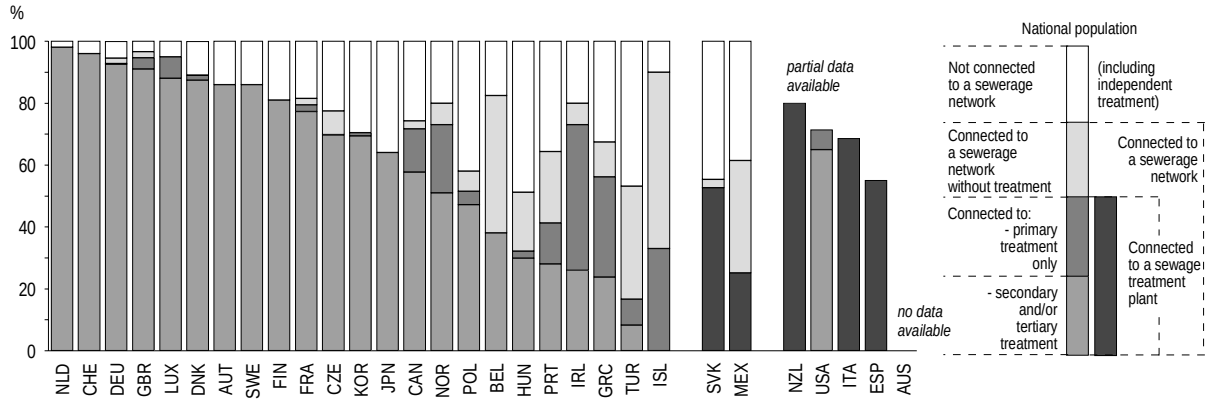

**STATE AND TRENDS SUMMARY**

Despite significant progress in reducing pollution loads from municipal and industrial point sources through installation of appropriate waste water treatment plants, improvement in surface water quality is not always easy to discern; other factors, such as erosion and pollution from diffuse sources, may continue to reduce water quality. Nevertheless, loads of oxygen demanding substances have diminished: the dissolved oxygen content in the larger rivers is satisfactory for most of the year.

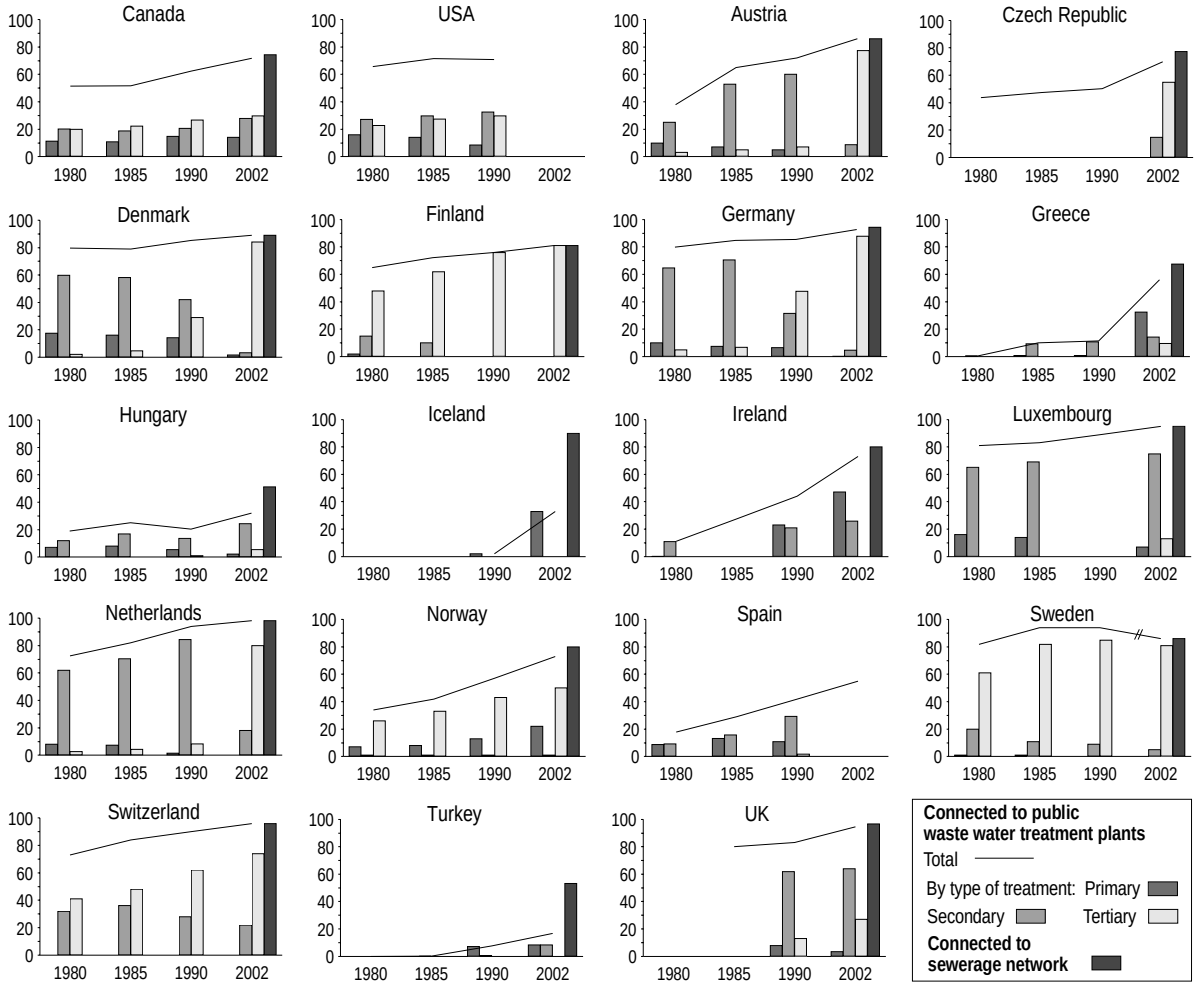
While nitrate concentrations appear to have stabilised locally, probably as a result of nitrogen removal from sewage effluents or a reduction of fertiliser use, in many rivers the trend cannot yet be detected. Furthermore, success in cleaning up the worst polluted waters is sometimes achieved at the cost of failing to protect the few remaining pristine waters, so that all of a country's waters tend to be of average quality.

## WASTE WATER TREATMENT 10

**Sewerage and sewage treatment connection rates, early 2000s**




**Trends in sewage treatment connection rates**
per cent of national population connected



## 10 WASTE WATER TREATMENT

| | | Waste water treatment Public sewage treatment connection rates | | | | | | | | Sewerage network connection rates | Public expenditure on waste water treatment | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | early 1980s | | | | early 2000s | | | | early 2000s | early 2000s | |
| | | Total | *of which:* | Secondary treatment | Tertiary treatment | Total | *of which:* | Secondary treatment | Tertiary treatment | Total | Total | *of which:* Investment |
| | | % pop. | | % pop. | % pop. | % pop. | | % pop. | % pop. | % pop. | USD/capita | % |
| Canada | ♦ | 51.5 | | 20.2 | 19.9 | 71.7 | | 28.0 | 29.7 | 74.3 | 67.7 | .. |
| Mexico | ♦ | .. | | .. | .. | 25.1 | | .. | .. | 61.4 | 1.8 | 26 |
| USA | ♦ | 65.8 | | 27.1 | 22.8 | 71.4 | | 30.9 | 34.1 | .. | .. | .. |
| Japan | ♦ | 30.0 | | 30.0 | - | 64.0 | | 54.0 | 10.0 | 64.0 | 84.1 | .. |
| Korea | ♦ | 8.3 | | .. | .. | 69.9 | | 68.0 | 0.8 | 70.5 | 80.8 | 78 |
| Australia | ♦ | .. | | .. | .. | .. | | .. | .. | 90.0 | 36.7 | 43 |
| New Zealand | ♦ | .. | | .. | .. | 80.0 | | .. | .. | .. | .. | .. |
| Austria | ♦ | 38.0 | | 25.0 | 3.0 | 86.0 | | 8.6 | 77.4 | 86.0 | 100.8 | 47 |
| Belgium | ♦ | 22.9 | | 22.9 | - | 38.1 | | 22.0 | 16.1 | 82.4 | 74.3 | 67 |
| Czech Rep. | ♦ | 43.7 | | .. | .. | 69.8 | | 14.8 | 54.9 | 77.5 | 27.3 | 100 |
| Denmark | ♦ | 79.6 | | 59.8 | 2.2 | 89.0 | | 3.4 | 84.0 | 89.0 | 123.0 | 37 |
| Finland | ♦ | 65.0 | | 15.0 | 48.0 | 81.0 | | - | 81.0 | 81.0 | 58.4 | 45 |
| France | ♦ | 57.0 | | .. | .. | 79.4 | | 50.8 | 26.5 | 81.5 | 109.7 | 47 |
| Germany | ♦ | 79.9 | | 64.7 | 5.0 | 92.2 | | 4.7 | 87.9 | 94.5 | 168.7 | 50 |
| Greece | ♦ | 0.5 | | 0.5 | - | 56.2 | | 14.2 | 9.6 | 67.5 | 14.3 | 89 |
| Hungary | ♦ | 19.0 | | 12.0 | - | 32.2 | | 24.4 | 5.5 | 51.2 | 45.6 | 100 |
| Iceland | ♦ | .. | | - | - | 33.0 | | - | - | 90.0 | 17.2 | 77 |
| Ireland | ♦ | 11.2 | | 11.0 | - | 73.0 | | 26.0 | - | 80.0 | 58.7 | 69 |
| Italy | ♦ | 30.0 | | .. | .. | 68.6 | | .. | .. | .. | 3.2 | 15 |
| Luxembourg | ♦ | 81.0 | | 65.0 | - | 95.0 | | 75.0 | 13.0 | 95.0 | 96.8 | 59 |
| Netherlands | ♦ | 72.4 | | 61.9 | 2.6 | 98.1 | | 18.1 | 80.0 | 98.1 | 113.5 | 42 |
| Norway | ♦ | 34.0 | | 1.0 | 26.0 | 73.0 | | 1.0 | 50.0 | 80.0 | 81.2 | 45 |
| Poland | ♦ | .. | | .. | .. | 54.7 | | 28.8 | 22.7 | 61.2 | 42.0 | 81 |
| Portugal | ♦ | 2.3 | | .. | .. | 41.3 | | 26.0 | 2.0 | 64.3 | 40.0 | 75 |
| Slovak Rep. | | 27.3 | | .. | .. | 52.7 | | .. | .. | 55.3 | .. | .. |
| Spain | ♦ | 17.9 | | 9.1 | - | 55.0 | | .. | .. | .. | 66.2 | 67 |
| Sweden | ♦ | 82.0 | | 20.0 | 61.0 | 86.0 | | 5.0 | 81.0 | 86.0 | .. | .. |
| Switzerland | ♦ | 73.0 | | 32.0 | 41.0 | 96.0 | | 22.0 | 74.0 | 96.0 | 131.6 | 55 |
| Turkey | ♦ | - | | - | - | 16.6 | | 8.3 | - | 53.2 | 8.7 | 86 |
| UK | ♦ | .. | | .. | .. | 94.6 | | 64.0 | 27.0 | 96.6 | 4.7 | 4 |

♦ *See Technical Annex for data sources, notes and comments.*

**STATE AND TRENDS SUMMARY**

OECD countries have progressed with basic domestic water pollution abatement: the share of the population connected to a municipal waste water treatment plant rose from about 50% in the early 1980s to almost 70% today. Due to varying settlement patterns, economic and environmental conditions, starting dates, and the rate at which the work was done, the share of population connected to waste water treatment plants and the level of treatment varies significantly among OECD countries: secondary and tertiary treatment has progressed in some while primary treatment remains important in others. Some countries have reached the economic limit in terms of sewerage connection and must find other ways of serving small, isolated settlements.

The overall amount spent on sewerage and waste water treatment, and the relative shares of investment and operating expenditure within the total, also differ widely among countries. Some countries completed their sewer systems long ago and now face considerable investment to renew pipe networks. Other countries may recently have finished an expansion of waste water treatment capacity and the weight of expenditure has shifted to operating costs. Yet other countries must still complete their sewerage networks even as they build waste water treatment stations. For the OECD as a whole, more than half of public pollution abatement and control expenditure relates to water (sewerage & waste water treatment) representing up to 1% of GDP.