Environment at a Glance Indicators

Freshwater resources

Context

Issues at stake

Freshwater resources are of major environmental, economic and social importance. Their distribution varies widely among and within countries. Their availability and their quality are affected by water abstractions such as for public supply irrigation, industrial processes or cooling of power plants, pollution loads from agriculture, industry and households, changes in climate and weather conditions.

Overexploitation, pollution and inefficient use of water are of concern. Over-abstraction of water, in particular, can lead to low river flows, depleted groundwater and degraded water quality, loss of wetlands, desertification and risks for food security and economic production. Infrastructure developments can affect the natural integrity of rivers, lakes, aquifers and wetlands. If pressure from human activities becomes so intense that water quality is impaired to the point that it requires ever more advanced treatment, or that aquatic plant and animals in rivers and lakes are threatened, then the sustainability of water resource use is in question.

Policy challenges

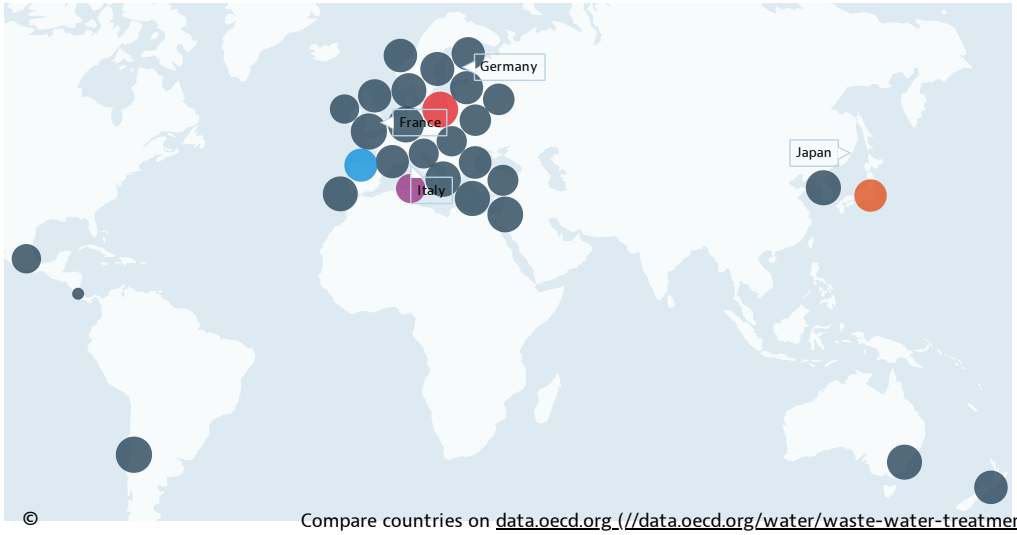
The main challenge is to ensure **sustainable management of water resources** and water services so as to maintain adequate supplies of freshwater of suitable quality for economic activities, human use and well-being, and support aquatic and other ecosystems. This requires an integrated approach for the management of water and water-related ecosystems.

- **Water quantity** is best managed through a combination of policies that manage demand for water, promote water use efficiency, and allocate water where it is most needed.
- **Water quality** management requires preventing and reducing pollution from all sources, through a systematic integration of water quality considerations in

agricultural and other policies and appropriate treatment of wastewater. Both polluters and users should be kept accountable

- **Water risks** and disasters are best managed in a cooperative way through risk assessments and a mix of prevention and mitigation measures. Policy coherence across climate change adaptation, water management, land management, spatial planning, biodiversity protection and disaster risk reduction is crucial.

Wastewater treatment (//data.oecd.org/water/waste-water-treatment.htm) Total, Percentage, 2017 or latest available



Compare countries on data.oecd.org (//data.oecd.org/water/waste-water-treatment.htm)

Measuring progress and performance

Environmental performance for **water resources** can be assessed against domestic objectives and international commitments. The 2030 Agenda for Sustainable Development (New York, September 2015) explicitly considers **preserving water resources and promoting wastewater management** for all under *Goal 6 "Ensure availability and sustainable management of water and sanitation for all",* and *Goal 3 "Ensure healthy lives and promote well-being for all at all ages"*.

At national level countries have set receiving water standards, effluent limits, pollution load reduction targets and established water permits. Main international agreements and legislation include 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 and the EU water directives.

The information available to evaluate countries' progress with water resource management however remains insufficient to carry out a thorough analysis.

Indicator groups

- Water abstractions: water stress, total water abstractions (levels and intensities), water abstractions for public supply, water abstractions for irrigation and surface of irrigated land.
- Wastewater treatment: sewage treatment connection rates

Water abstractions

Key messages

- Pressures on **water resources** continue to mount, and competition for access to water is increasing driven by economic and population growth.
- The average **water stress** has diminished in most OECD countries since 2000 thanks to improvements in technologies and resource management. Very few countries experience medium-to-high water stress. But most countries face seasonal or local water quantity problems that can constrain economic development and human well-being.
- **Water abstractions** have decoupled from economic and population growth in the OECD area, with OECD average per capita abstractions declining since 2000. Worldwide however, freshwater abstractions continue to grow at a faster rate than population growth, with agriculture using about 70% of all abstractions.
- The use of **irrigation water** in many OECD countries has been declining since 2000, though in few countries it started to increase again in recent years.

Main trends and recent developments

Pressures on **water resources** continue to mount, and competition for access to water is increasing driven by economic and population growth.

Water stress levels vary greatly among and within countries. They have diminished in most OECD countries since 2000. Korea, Spain and Turkey experience medium water stress; Israel experiences high water stress. In a few countries, such as Iceland, water resources are abundant and population density is low. Most countries however face seasonal or local water quantity problems, and several have extensive arid or semi-arid regions where water availability is a constraint on economic development and human well-being.

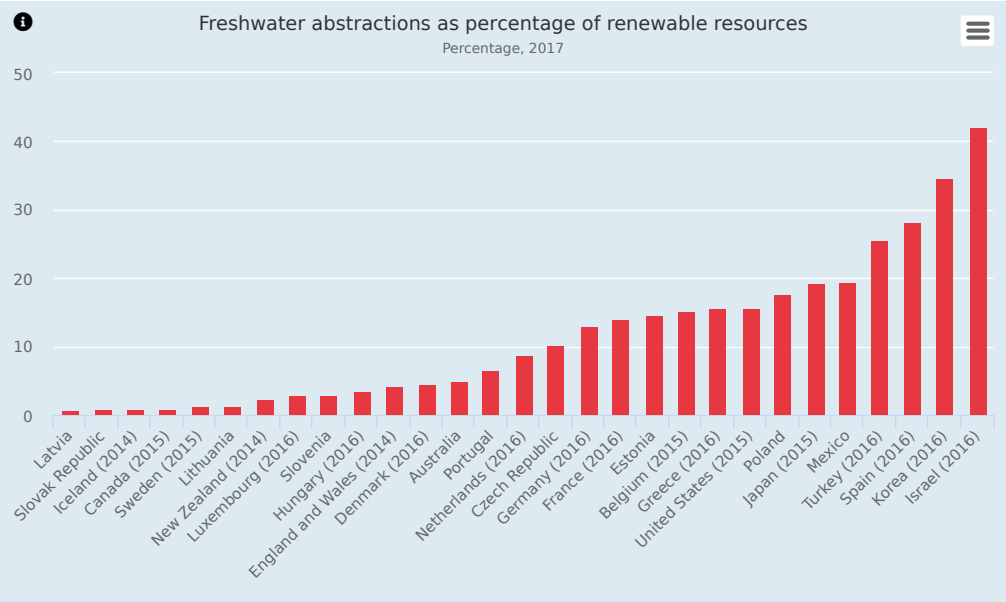
Water abstractions have decoupled from economic and population growth in the OECD area on average, with per capita abstractions declining since 2000. But results vary within and among countries, and the information available to assess countries' water resources remains insufficient to carry out a more thorough analysis. The highest per capita abstractions are found in the OECD America region, at above 1 000

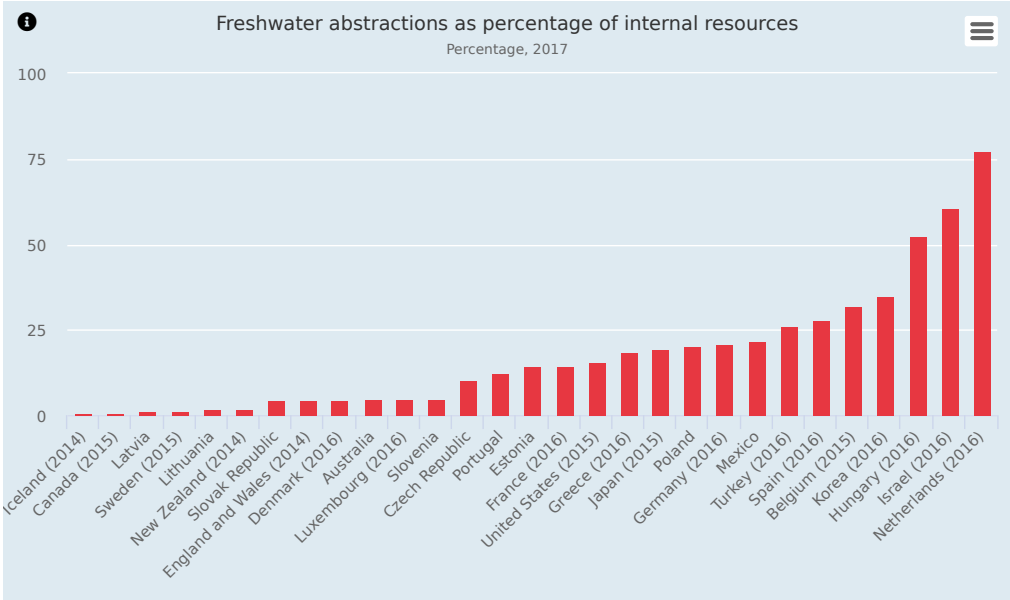
m^3/inhabitant mainly driven by the United States, followed by the OECD Asia-Oceania region (around 620 m^3/inhabitant) and the OECD Europe region (around 480 m^3/inhabitant). The uses for which water is abstracted vary across countries. While some countries devote over half of abstractions to public supply, others allocate it mostly to agriculture including Turkey, Mexico, Spain, Greece, or to electric cooling such as Germany and France. Worldwide, freshwater abstractions continue to grow at a faster rate than population growth.

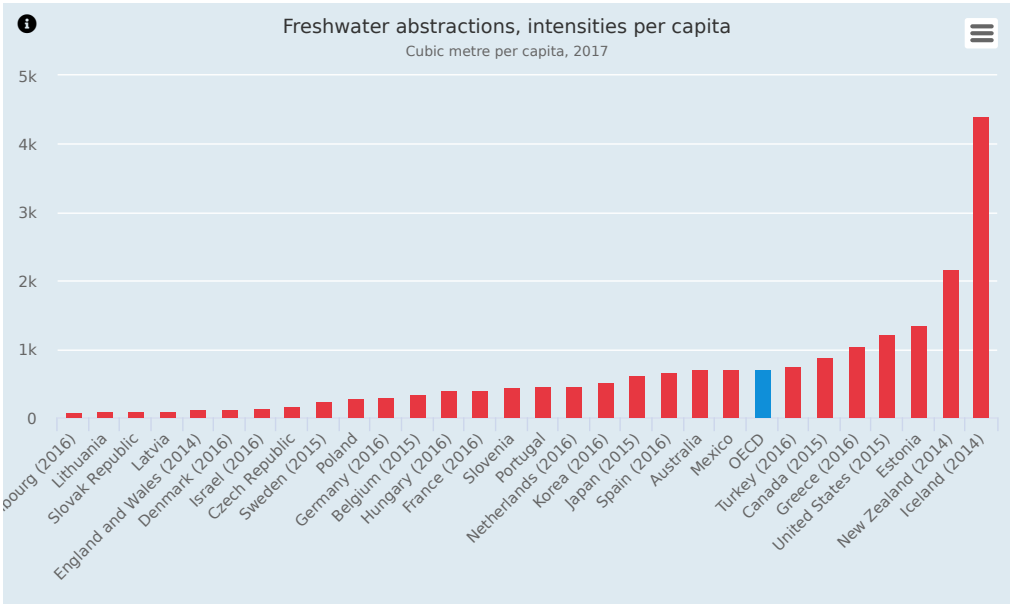
As of the 1980s, some countries have been stabilising their **abstractions** through more efficient irrigation techniques, the decline of water-intensive industries, increased use of more efficient technologies and reduced losses in pipe networks. In some cases stabilisation was achieved through increased use of alternative water sources, including water reuse and desalination. The use of **irrigation water** in many OECD countries has been declining since 2000, albeit at different rates. In some countries such as Canada and Korea, it has recently increased again. The share of irrigation in total abstractions varies greatly across countries depending on the structure of their economy and their agricultural practices; it ranges from close to zero in Iceland to over 70% in Greece and Turkey. Worldwide, agriculture uses about 70% of all abstractions.

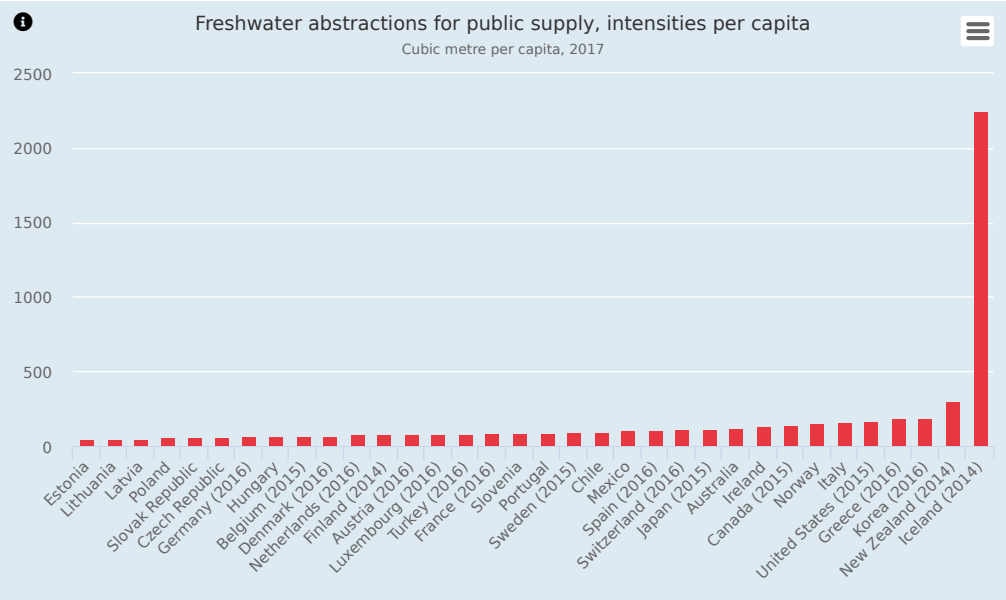
Irrigated surfaces also vary greatly across countries. Since 2000, they have declined in about half countries for which data are available but more than doubled in countries such as Belgium and the Netherlands.

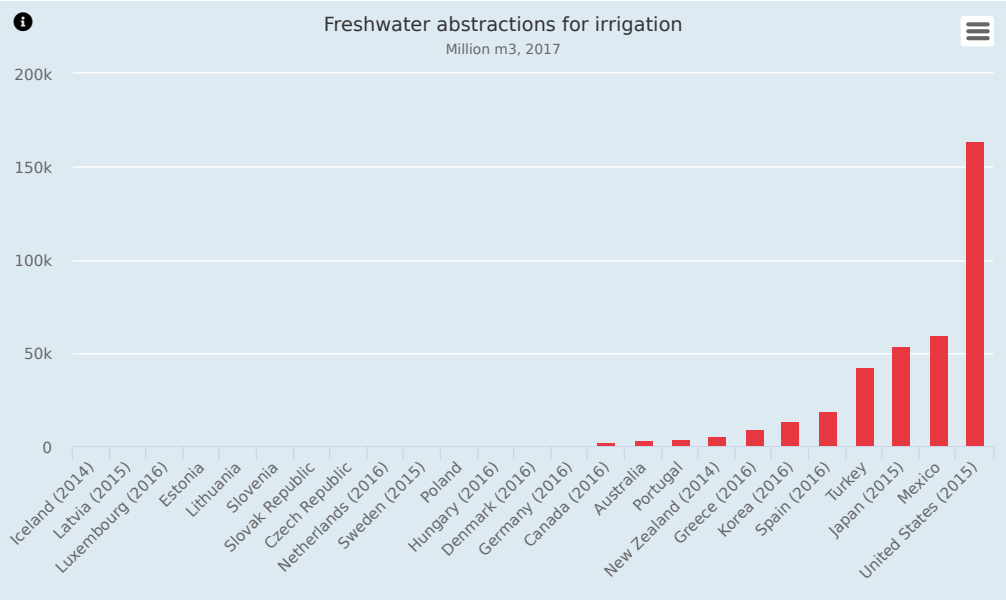
Indicators

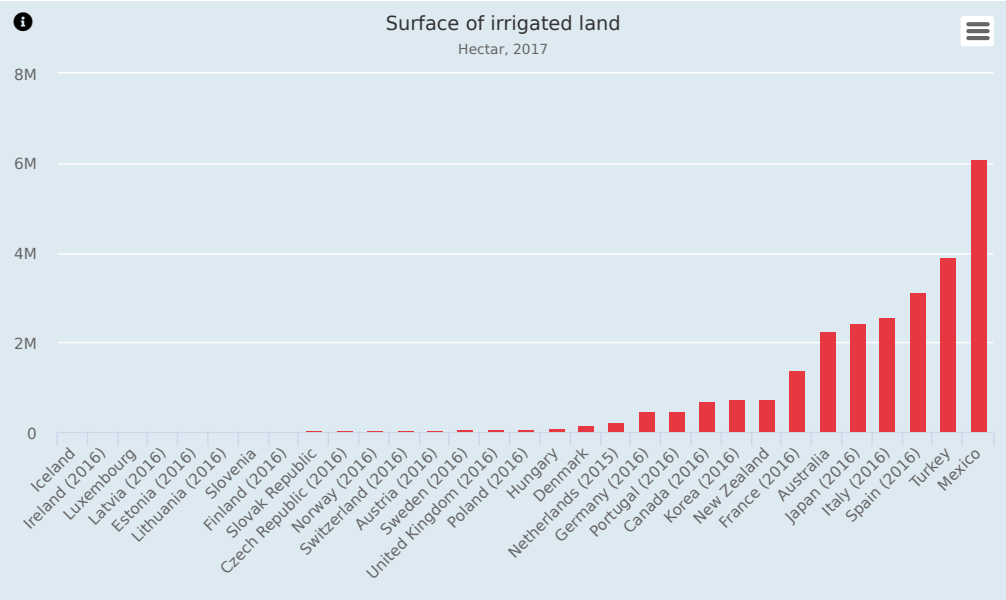



Freshwater abstractions as percentage of internal resources
Percentage, 2017
100
75
50
25
0
Iceland (2014)
Canada (2015)
Latvia
Sweden (2015)
Lithuania
New Zealand (2014)
Slovak Republic
England and Wales (2014)
Denmark (2016)
Australia
Luxembourg (2016)
Slovenia
Czech Republic
Portugal
Estonia
France (2016)
United States (2015)
Greece (2016)
Japan (2015)
Poland
Germany (2016)
Mexico
Turkey (2016)
Spain (2016)
Belgium (2015)
Korea (2016)
Hungary (2016)
Israel (2016)
Netherlands (2016)


Freshwater abstractions, intensities per capita
Cubic metre per capita, 2017
5k
4k
3k
2k
1k
0
Lithuania
Slovak Republic
Latvia
England and Wales (2014)
Denmark (2016)
Israel (2016)
Czech Republic
Sweden (2015)
Poland
Germany (2016)
Belgium (2015)
Hungary (2016)
France (2016)
Slovenia
Portugal
Netherlands (2016)
Korea (2016)
Japan (2015)
Spain (2016)
Australia
Mexico
OECD
Turkey (2016)
Canada (2015)
Greece (2016)
United States (2015)
Estonia
New Zealand (2014)
Iceland (2014)


Freshwater abstractions for public supply, intensities per capita
Cubic metre per capita, 2017
2500
2000
1500
1000
500
0
Estonia
Lithuania
Latvia
Poland
Slovak Republic
Czech Republic
Germany (2016)
Hungary
Belgium (2015)
Denmark (2016)
Netherlands (2016)
Finland (2014)
Austria (2016)
Luxembourg (2016)
Turkey (2016)
France (2016)
Slovenia
Portugal
Sweden (2015)
Chile
Mexico
Spain (2016)
Switzerland (2016)
Japan (2015)
Australia
Ireland
Canada (2015)
Norway
Italy
United States (2015)
Greece (2016)
Korea (2016)
New Zealand (2014)
Iceland (2014)


Freshwater abstractions for irrigation
Million m3, 2017
200k
150k
100k
50k
0
Iceland (2014)
Latvia (2015)
Luxembourg (2016)
Estonia
Lithuania
Slovenia
Slovak Republic
Czech Republic
Netherlands (2016)
Sweden (2015)
Poland
Hungary (2016)
Denmark (2016)
Germany (2016)
Canada (2016)
Australia
Portugal
New Zealand (2014)
Greece (2016)
Korea (2016)
Spain (2016)
Turkey
Japan (2015)
Mexico
United States (2015)



Comparability and interpretation

These indicators give insights into quantitative aspects of water resources, but may hide important variations at subnational (e.g. river basin) level, in particular in countries with extensive arid and semi-arid regions. Information on the use of water resources can be derived from water resource accounts and statistics. This information is available for most OECD countries, but is often incomplete. The definitions and estimation methods may vary considerably from country to country and over time. In general, data availability and quality are best for water abstractions for public supply than for other sectors. For some countries, the data refer to water permits and not to actual abstractions. Data for the United Kingdom refer to England and Wales only.

For further details see the metadata in the source databases listed under *Sources* below.

Wastewater treatment

Key messages

- The provision of **wastewater treatment** services has improved in the OECD area since 2000. In more than one third of the countries over 80% of the population are connected to a sewage treatment plant with at least secondary treatment.
- Challenges remain as regards the upgrading of existing treatment infrastructure and servicing small and isolated settlements with adequate **wastewater treatment**.

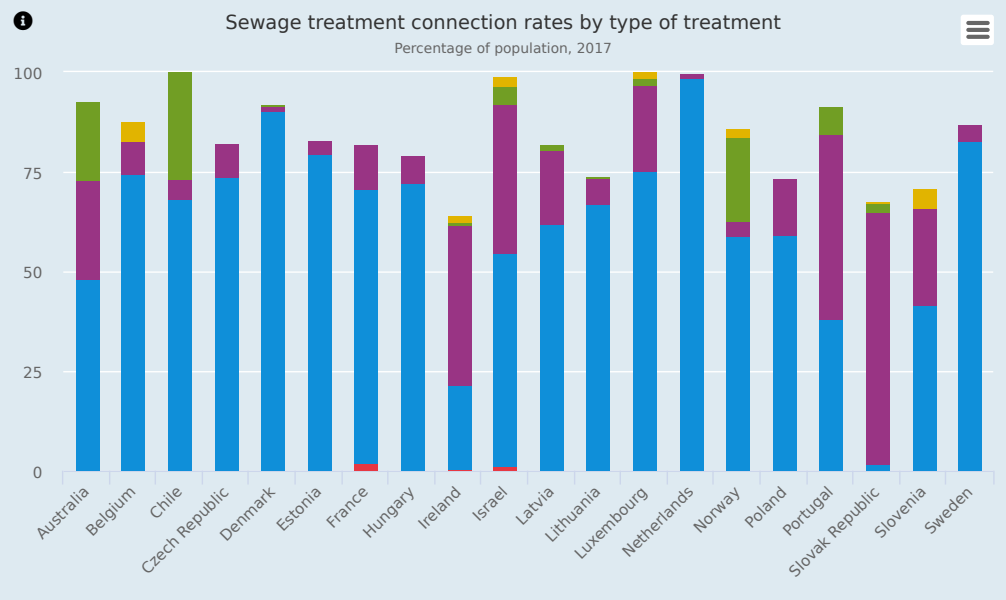
Main trends and recent developments

Access to **wastewater treatment** has improved in the OECD area since 2000. But the **connection rates** to a public wastewater treatment plant and the level of treatment vary significantly across countries.

More than one third of countries have over 80% of their population connected to a sewage treatment plant with secondary or tertiary treatment. A few countries still have more than 20% of their population not connected to a public wastewater treatment system. Countries that have reached the economic and technical limits in terms of sewage connection, must find means to serve small, isolated settlements, including through effective independent on-site treatment systems.

In many countries, the main challenge is to ensure proper financing for renewing and upgrading existing and often ageing infrastructure. More efforts need to be made to increase advanced wastewater treatment where economically viable and environmentally justified, and to cope with new and emerging pollutants.

Indicators



Comparability and interpretation

The data show total connection rates and the extent of secondary and/or tertiary sewage treatment to provide an indication of efforts to reduce pollution loads. This indicator should be read in connection with information on public wastewater treatment expenditure. It should be related to an optimal national connection rate, recognising that the optimal connection rate is not necessarily 100%: it may vary among countries and depends on geographical features and on the spatial distribution of settlements.

Data on the share of the population connected to wastewater treatment plants are available for almost all OECD countries. In some countries, data relate to wastewater treated expressed in population equivalents (expressing the ratio of the sum of the pollution load produced during 24 hours by industrial facilities and services to the individual pollution load in household sewage produced by one person in the same time) and are thus not fully comparable. Information on the level of treatment remains partial. Data include estimates.

For further details see the metadata in the source databases listed under *Sources* below.

Glossary

Gross water abstraction	Water removed from any source, either permanently or temporarily. Mine water and drainage water are included. Water used for hydroelectricity generation is an in-situ use and is excluded.
Intensity of use of freshwater resources (or water stress)	Is expressed as gross freshwater abstraction in % of total available renewable freshwater resources (including inflows from neighbouring countries) or in % of internal freshwater resources (i.e. precipitation - evapotranspiration). Water used for hydroelectricity generation (which is considered an in situ use) is excluded. The following stress levels can be distinguished: Low (less than 10%): generally there is no major stress on the available resources. Moderate (10% to 20%): indicates that water availability issues are becoming a constraint on development and significant investments are needed to provide adequate supplies. Medium-high (20% to 40%): implies the management of both supply and demand, and conflicts among competing uses need to be resolved. High (more than 40%): indicates serious scarcity, and usually shows unsustainable water use, which can become a limiting factor in social and economic development. Freshwater resources: the data refer to long-term annual averages over a minimum period of 30 consecutive years.
Sewage treatment connection rates	The percentage of the national population connected to a wastewater treatment plant. “Connected” means actually connected to a wastewater treatment plant through a public sewage network. It does not take into account independent private facilities (e.g. septic tanks), used where public systems are not economic. Primary treatment: physical and/or chemical process involving settlement of suspended solids, or other process in which the BOD5 of the incoming wastewater is reduced by at least 20% before discharge and the total suspended solids are reduced by at least 50%. Secondary treatment: process generally involving biological treatment with a secondary settlement or other process, with a BOD removal of at least 70% and a COD removal of at least 75%. Tertiary treatment: treatment of nitrogen and/or phosphorous and/or any other pollutant affecting the quality or a specific use of water (microbiological pollution, colour, etc.).

Data sources

OECD, "Water: Freshwater abstractions", *OECD Environment Statistics* (database), *https://doi.org/10.1787/09a848f4-en*.

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References and further reading

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UNEP (2016), *A Snapshot of the World’s Water Quality: Towards a global assessment*, United Nations Environment Programme, Nairobi, Kenya, *https://uneplive.unep.org/media/docs/assessments/unep_wwqa_report_web.pdf*.

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Metadata, Legal and Rights

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