Water Resources and Use

Extract from France's 2021 Environmental Performance Review

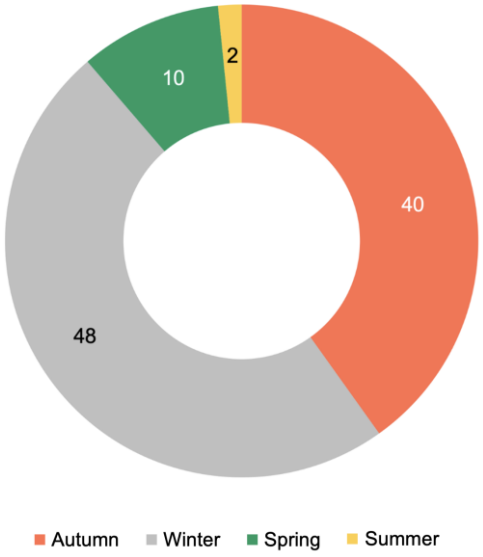
Water Resources and Use

France's abundant natural freshwater resources are used for domestic purposes (drinking water) and economic purposes (agriculture, industry, leisure, cooling systems for power plants). Annual withdrawals have been falling for the last 20 years, except for agriculture which have remained stable. Regulations are designed to ensure both balanced management and share of water resources in case of scarcity.

WEAKER RESOURCE AND WATER STRESSES IN SUMMER

Freshwater is found in surface water (rivers, streams, lakes) and groundwater. Stocks are replenished with an average volume of 210 billion m^3 each year in Metropolitan France, supplied by rainfall and rivers from neighbouring countries. With total withdrawals of about 31 billion m^3, Metropolitan France's annual water needs seem to be covered. However, water withdrawals peak in summer when availability is lowest, resulting in stress on local resources and temporary shortages *(Figure 1).*

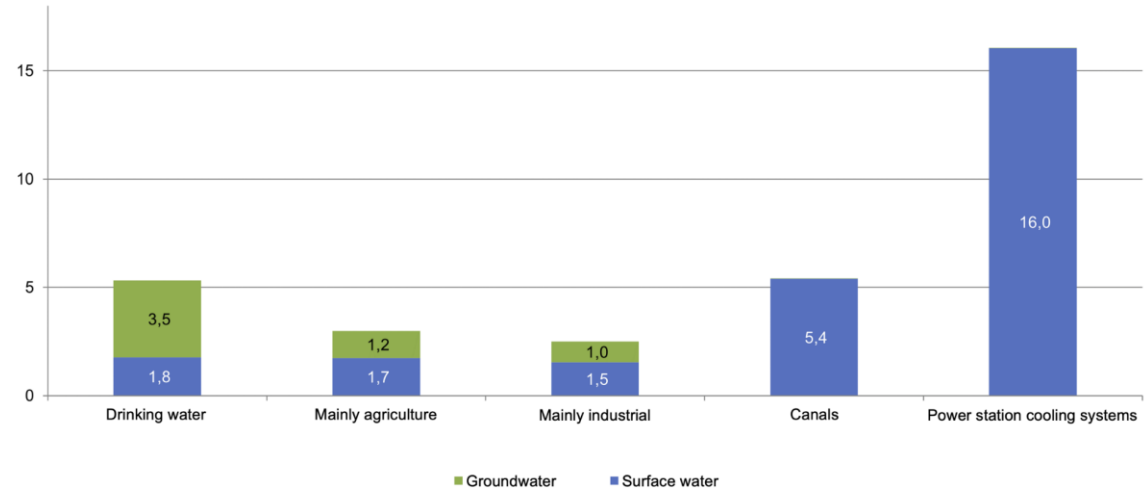
Figure 1: Breakdown of renewable freshwater supply by hydrologic season (average 1990-2018)
In %



Note: By convention, the hydrological season begins in September. Autumn includes September to November, winter is December to February, spring is March to May and summer is June to August.
Sources: *Météo-France, total rainfall, evaporation; Banque Hydro, inflow. Treatment: SDES, 2021*

Over 80% of freshwater withdrawals come from surface waters (rivers, lakes, canals, reservoirs, etc.), taking into account quantities for cooling power plants and supplying canals. Excluding these two uses, freshwater withdrawals come from groundwater and surface water in equal quantities *(Figure 2)*.

Figure 2: Breakdown of freshwater withdrawals by use and by medium in 2018
In billion m^3

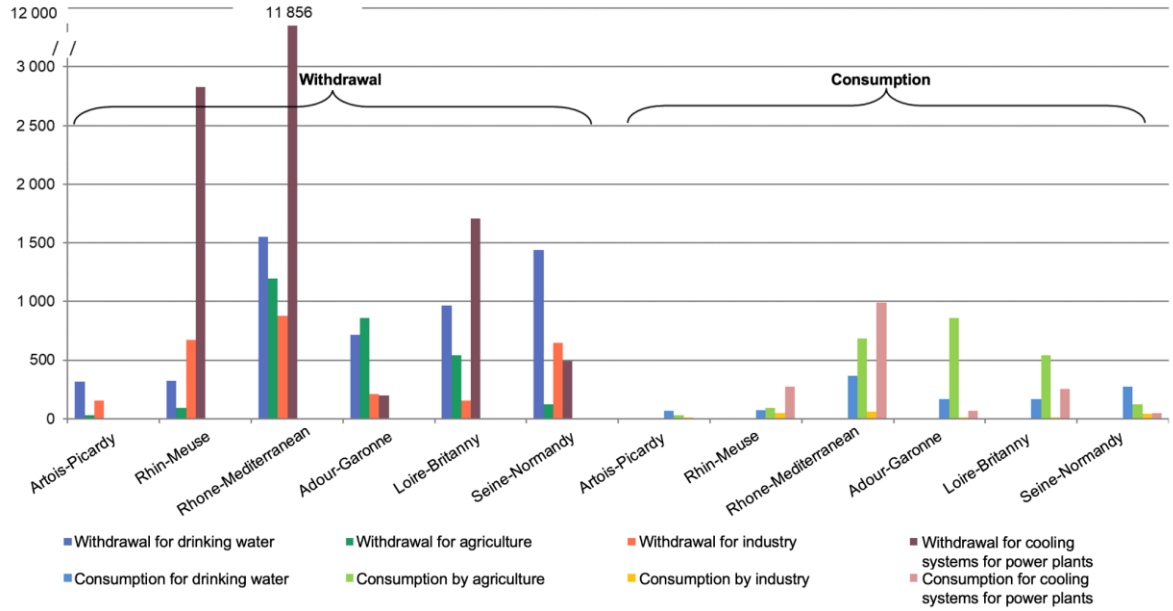


Note: data reported to water agencies, excludes samples taken at sea and brackish water, excludes hydroelectricity.
Scope: Metropolitan France.
Source: *OFB, Banque nationale des prélèvements quantitatifs en eau (BNPE). Treatment: SDES, 2021*

WATER WITHDRAWALS AND WATER CONSUMED

Water consumed is the share of water withdrawn and not returned to the aquatic environment. This varies greatly depending on use. On average, between 2008 and 2018, the annual volume of water consumed in Metropolitan France is estimated at 5.3 billion m^3 (or 82 m^3 per inhabitant). This represents roughly 20% of water withdrawn, excluding canal supplies. Agriculture is the main water-consuming activity at 45%, followed by cooling systems for power plants (31%), drinking water (21%) and industry (4%). This varies greatly depending on the river basin. The majority of water is consumed for agriculture in the Adour-Garonne (78%) and Loire basins (55%), for drinking water in the Artois-Picardy (62%) and Seine-Normandy (56%) basins, and for electricity production in the Rhine-Meuse (58%) and Rhone-Mediterranean (46%) basins *(Figure 3)*.

Figure 3: Freshwater withdrawal and consumption in France (average 2008-2018)
In million m^3



Sources: *OFB, Banque nationale des prélèvements quantitatifs en eau (withdrawal); EDF (water consumption coefficients for nuclear power plants); Observatoire des services publics d'eau et d'assainissement (efficiency rate of drinking water distribution networks); Ifen, OIEau, water utilities, Water withdrawals in France in 2001, March 2004 (consumption coefficients by activity). Treatment: SDES, 2021*

AN INDICATOR FOR LOCAL RESOURCE EXPLOITATION

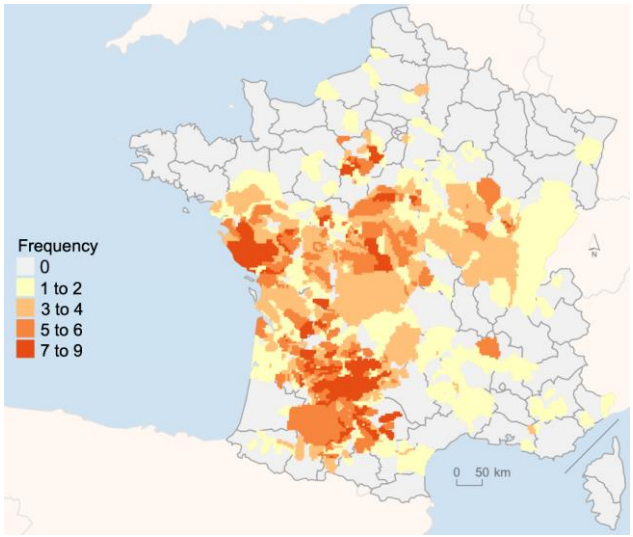
The relative importance of water withdrawal uses differs according to geographical area. Volumes for drinking water are distributed throughout the country but use for agriculture is concentrated in the south and for industry in the east and north. A high proportion of freshwater withdrawn for cooling power plants is used on a limited number of sites.

The water resource exploitation index (WEI+)[1] assesses whether consumption exceeds the resource's capacity of renewal, particularly for the natural ecosystem's needs. It is defined by the European Environment Agency as the ratio between water consumption and renewable water resource over a given period for a certain area. The renewable water resource of a catchment basin is the consumed water volume plus the river outflow volume[2]. The WEI+ index increases when the renewable water resource is low and water consumption linked to human activity is high. It fluctuates from year to year and with the seasons.

In mainland France, the impact of water use is more important in the summer period (June to August): 60% of the annual water consumption takes place during this period when only 15% of the annual volume of freshwater flows through the territory (average 2008-2018).

[1] *WEI for* Water Exploitation Index.
[2] *Faergemann H., 2012: Update on Water Scarcity and Droughts indicator development, European Commission.*

Map 1: Frequency of annual critical level restrictions on surface water of over one month from 2012 and 2020



Note: 3 to 4 means that crises of at least one month occurred 3 or 4 times in 9 years.
Scope: Metropolitan France and Corsica
***Sources**: Ministère en charge de l'Écologie ; Ministère en charge de l'Agriculture, 2021. Treatment: SDES, 2021*

France experiences no chronic scarcity at the moment. However, access to water throughout the country is not guaranteed all year round *(Map 1)*. To prevent water-use conflict due to local shortages and to preserve the aquatic ecosystem (respect for reserved flows), the government, water utilities and local actors aim at adjusting water withdrawals to available resources, anticipating the consequences of climate change such as increased drought frequency and decreased flow rate. A foreseeable water shortage triggers official gradual and temporary water restrictions to preserve resources for priority uses. The critical level determines partial or total bans. Between 2012 and 2020, critical level restrictions were frequently applied in certain areas of France, particularly in the west and south-west, demonstrating the vulnerability of water resources in those areas.

FOR MORE INFORMATION

- *Eau et milieux aquatiques, les chiffres clés – Édition 2020*, *SDES, Datalab,* December 2020, 128 pp.
- *Les prélèvements d'eau douce en France : les grands usages en 2013 et leur évolution depuis 20 ans,* SDES, *Datalab,* January 2017, 26 pp.
- Gestion et utilisation des ressources : un enjeu majeur – Notre-environnement