Resource efficiency and low carbon economy

Freshwater use

Indicator	EU indicator past trend	Selected objective to be met by 2020	Indicative outlook of the EU meeting the selected objective by 2020
Use of freshwater resources		Water abstraction should stay below 20% of available renewable freshwater resources — Roadmap to a resource efficient Europe	
While efficiency gains have been achieved, hotspots for water stress conditions are likely to remain given continued pressures such as climate change, increasing population and rapid urbanisation			

The Seventh Environment Action Programme (7th EAP) aims to ensure that, by 2020, water stress (lack of water) is prevented or significantly reduced in the EU. Water is an essential component for preserving biodiversity and maintaining other freshwater ecosystem services such as public water supply. Freshwater also serves as a vital input to economic activities across Europe, including agriculture, tourism and industrial activities.

While freshwater is relatively abundant in Europe, water availability and socio-economic activity are unevenly distributed, leading to major differences in water stress levels across the continent. With the exception of some northern and sparsely populated areas that possess abundant freshwater resources, water stress occurs in many areas of Europe, particularly in the Mediterranean and parts of the Atlantic region, because they are confronted with a difficult combination of both a severe lack of freshwater and a high demand for it.

In general, a decrease in water abstraction in Europe has been observed for some economic sectors since the 1990s, mainly due to efficiency gains in industry and agriculture. On the other hand, little improvement has been achieved in water abstraction for public water supply. Between 2002 and 2012, water abstraction from freshwater resources has decreased by around 7 % in Europe. However, there are differences in trends observed across Europe, with water abstraction decreasing in eastern and western Europe and a slight increase in southern Europe.

While efficiency gains in industrial and agricultural water use, as well as in public networks, have been achieved and are likely to continue to improve in the period to 2020, hotspots for water stress conditions are likely to remain, given continued pressures such as climate change, increasing population and rapid urbanisation. However, because other drivers and pressures influencing both water demand and freshwater availability (e.g. consequences of climate change, increasing population and rapid urbanisation) are expected to intensify, it remains uncertain whether or not water stress can be prevented or significantly reduced. It is therefore important that water abstraction respects available renewable resource limits in order to prevent or significantly reduce water stress.

For further information on the scoreboard methodology please see Box I.1 in the EEA Environmental indicator report 2016

Setting the Scene

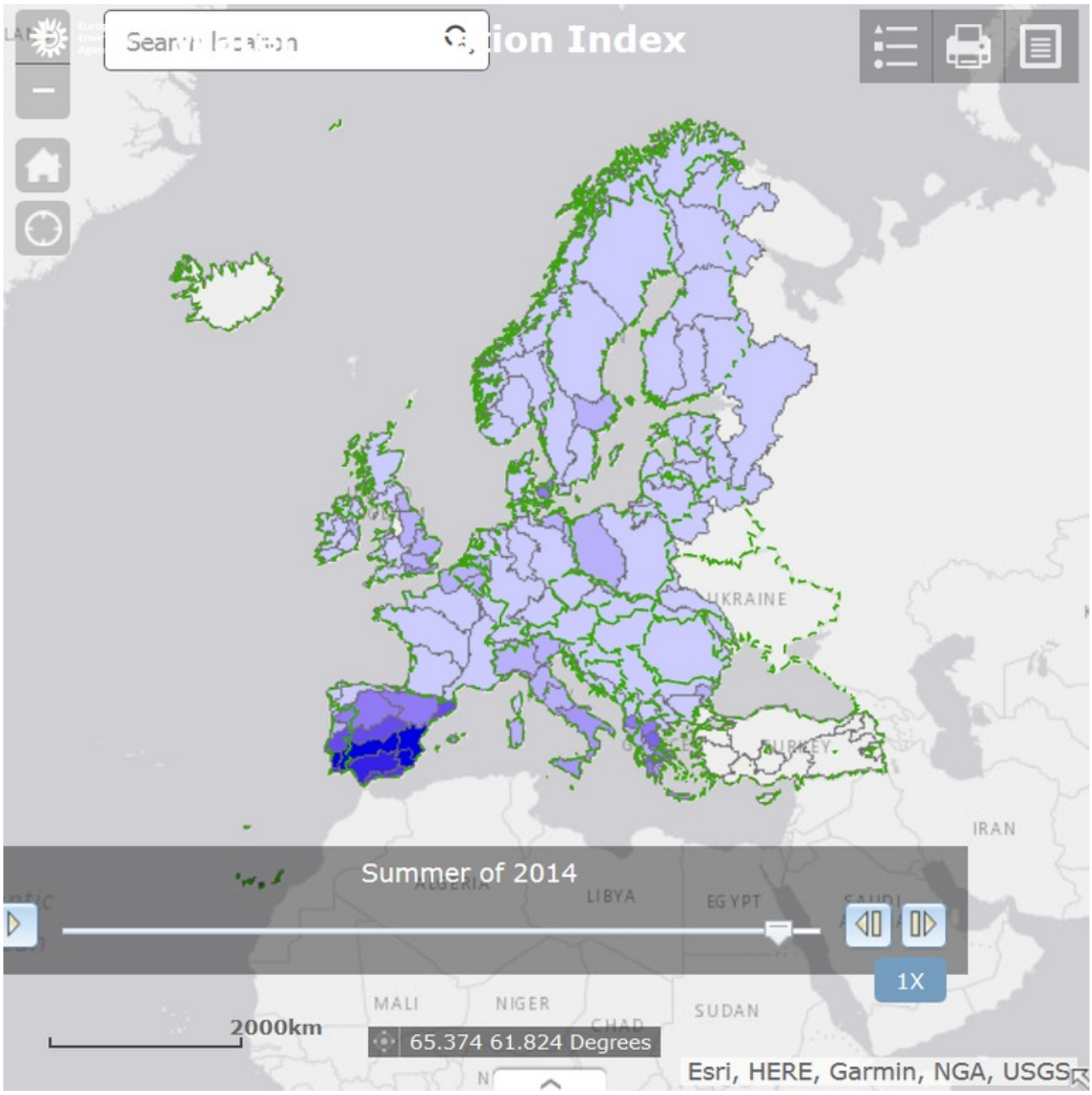
The 7th EAP aims to ensure that, by 2020, water stress (stress on available water resources) is prevented or significantly reduced in the European Union (EU, 2013). This briefing presents trends in the use of freshwater resources. Water is an input to key economic sectors such as agriculture, tourism and industry, and it is an essential component for preserving biodiversity and maintaining other freshwater ecosystem services such as public water supply. It is therefore important that water use (as measured by the Water Exploitation Index plus (WEI+)) respects the limits of available renewable freshwater resources and that water stress be prevented or significantly reduced.

Policy targets and progress

The EU's Roadmap to a Resource Efficient Europe (EC, 2011) includes a milestone for 2020 that 'water abstraction should stay below 20 % of available renewable freshwater resources'. As quantity and quality of water are closely linked, achieving 'good' status under the Water Framework Directive (see Surface waters briefing, AIRS_PO1.9, 2016)[1] also requires ensuring that there is no overexploitation of water resources.

While freshwater is relatively abundant in Europe (EEA, 2015), water availability and socio-economic activity are unevenly distributed, leading to major differences in water stress levels across the continent. Except in some northern and sparsely populated areas that possess abundant freshwater resources, water stress occurs during the summer months in many areas of Europe, in particular in densely populated areas and the Mediterranean (Figure 1). Almost 17 % of total renewable freshwater resources are abstracted in those regions, which are confronted with a difficult combination of a severe lack of freshwater and a high demand for it.

Figure 1. Water Exploitation Index plus for Europe, 2014



Source:
a) The European Pollutant Release and Transfer Register (E-PRTR), Member States reporting under Article 7 of Regulation (EC) No 166/2006, b) Waterbase - UWWTD: Urban Waste Water Treatment Directive – reported data , c) Waterbase - Water Quantity, d) European catchments and Rivers network system (Ecrins).

Note:
The Water Exploitation Index Plus has been calculated at the sub basin scale on seasonal resolution and then aggregated to river basin district scale. The reference year is 2014 (Q1: January, February, March; Q2: April, May, June; Q3: July, August, September; Q4: October, November, December). The spatial reference data used when estimating the WEI+ is the ECRINS (European catchments and rivers network system). The ECRINS delineation of sub basin and river basin district differ from those defined by Member States under the Water Framework Directive, particularly for transboundary river basin districts. Click on **more info** to see time series in WEI+ including level of sectorial pressures over freshwater resource

Rivers and groundwater aquifers supply more than 80 % of the total water used in Europe annually. Around 17 river basin districts, mainly in Spain, Malta, Cyprus, Greece, Portugal Poland and the United Kingdom experienced water stressed conditions during the summer months in 2014. This was due to relatively low net precipitation with large variations within and between years combined with their inability to draw on more distant water sources, as well as intense tourism activities. In addition, near-shore freshwater aquifers are threatened by seawater intrusion. The situation is worse in summer, when average precipitation is very low and water demand for agriculture and tourism is high. This makes water resource management, particularly on the Mediterranean islands, challenging.

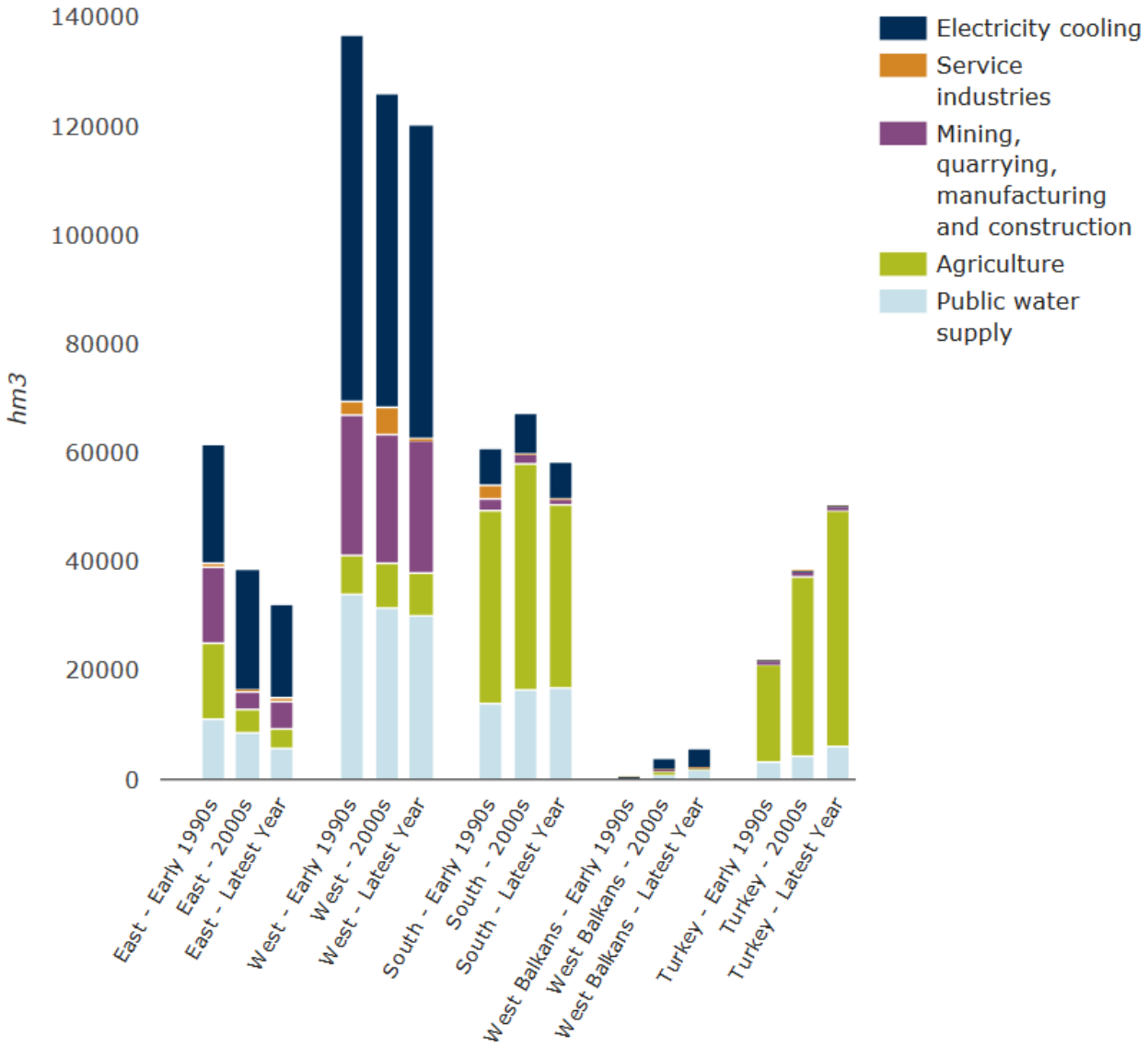
Summer is the period when most water stress occurs. This is due to a combination of factors. Water availability decreases because of hotter and drier conditions, while water abstraction doubles during the summer compared with winter, because people and sectors, such as agriculture and industry, require more freshwater, e.g. for cooling and irrigation. During winter only around 7 % of the total area of Europe experiences water stress conditions, whereas this rate reaches 11 % in summer. The highest WEI+ for the 2014 summer period was estimated for Spanish and Portuguese islands, Malta, Cyprus (81 %), the Jarft river basin in Poland (67 %) followed by the Segura river basin in Spain (62 %).

Across Europe, water abstraction from surface water resources accounts for 58 % of total water use, with the remaining 42 % coming from ground water. The WEI+ is driven by two important factors: (1) climate, which controls water availability and seasonality in water supply, and (2) water demand, which is largely driven by the population density and related economic activities. Thus, a strong relationship exists between this indicator and water use by economic sectors.

In general, a decrease in water abstraction in Europe has been observed for some economic sectors since the 1990s (Figure 2). In the EU-27 (plus Iceland, Norway and Switzerland), the industrial sector has improved its water efficiency, leading to a significant decrease (28 %) in water abstraction over this period. Agriculture has achieved a 7 % decrease in water abstraction, yet remains the sector with the highest water demand. Water abstraction for

electricity has decreased by 11 % since the 1990s, indicating a more or less constant trend since 2000. Little improvement has been achieved in water abstraction for public water supply, where there has been only a 3 % decrease since the 1990s.

Figure 2. Development of water abstraction across Europe by sector since the 1990s



Notes:
Turkey is plotted as an individual column in this graph to illustrate the large increase in its water use for agriculture.

- East: Bulgaria, Czech Republic, Estonia, Latvia, Lithuania*, Hungary, Poland, Romania, Slovenia, Slovakia
- South: Greece, Spain, Italy*, Cyprus*, Malta, Portugal*
- West: Belgium, Denmark, Germany, Ireland*, France, Liechtenstein, Luxembourg, the Netherlands, Austria, Finland, Sweden, England and Wales, Iceland, Norway, Switzerland*
- Western Balkans: Croatia, Montenegro, the former Yugoslav Republic of Macedonia, Albania, Serbia, Bosnia and Herzegovina, Kosovo under UNSCR 1244/99

* Water abstractions data are not available for all sectors and periods.

Data sources: a. Eurostat. Annual freshwater abstraction by source and sector b. EEA – Indicator WAT001

The long-term vision of the 7th EAP is of an innovative economy in which natural resources are managed sustainably. This includes water resources. However, in the coming years, the consequences of various drivers and pressures including climate change, increasing population and continued urbanisation of floodplain areas will increase the likelihood of flooding, droughts and water scarcity in some regions of Europe. There are many indications that water bodies already under stress are highly susceptible to climate change impacts, and that climate change may hinder attempts to restore some water bodies to good status.

While, efficiency gains in industrial and agricultural water use, as well as in public networks, have been achieved and are likely to continue to improve in the period to 2020, hotspots for water stress conditions are likely to remain. If the area under water stress is to be reduced, additional improvements to water efficiency in all sectors will be needed, but particularly the largest consuming sectors, agriculture and the public water supply. However, water efficiency improvements alone are unlikely to be sufficient to offset all the additional impacts of climate change on water scarcity in the future. It is therefore likely that water stress will continue to increase beyond 2020.

About the indicator

This indicator, commonly known as the WEI+, aims to illustrate water use. It shows the percentage used of the total renewable freshwater resources available. A WEI+ above 20 % implies that a water resource is under stress, and more than 40 % indicates severe stress and clearly unsustainable use of the resource (Raskin et al., 1997).

WEI+ data are available at fine spatial (e.g. sub-basin or river basin) and temporal (monthly or seasonal) scales to better capture local and seasonal variation in the pressure on renewable freshwater resources. The indicator focuses on water quantity. For some aspects of freshwater quality, see the Surface waters briefing (AIRS_PO1.9, 2016).[1]

Data on water use have also been derived from various sources such as WISE 3, EPRT-R, UWWTPs, Eurostat water data which have been integrated in the EEA water accounts production database. The methodology and latest assessment has a special focus on water use by economic sectors (see EEA, 2016).

Footnotes and References

EC, 2011, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 'Roadmap to a Resource Efficient Europe', section 4.4 (SEC(2011) 1067 final) (http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52011DC0571&from=EN).

EEA, 2015,Hydrological systems and sustainable water management, SOER briefing, European Environment Agency (http://www.eea.europa.eu/soer-2015/europe/hydrological-systems).

EEA, 2016, 'Report on European water quantity accounts and use of freshwater resources (CSI 018)', 2016 update, European Environment Agency, forthcoming.

EU, 2013, Decision No 1386/2013/EU of the European Parliament and of the Council of 20 November 2013 on a General Union Environment Action Programme to 2020 'Living well, within the limits of our planet', Annex A, paragraph 43(e) (OJ L 354, 28.12.2013, p. 171–200).

Raskin, P., Gleick, P.H., Kirshen, P., Pontius, R.G. Jr and Strzepek, K., 1997,Comprehensive assessment of the freshwater resources of the world, Stockholm Environmental Institute, Stockholm, Sweden. Document prepared for UN Commission for Sustainable Development 5th Session 1997 — Water stress categories are described on pages 27–29.

Briefings

1. AIRS_PO1.9, 2016, Surface waters, European Environment Agency

> Environmental indicator report 2016 – In support to the monitoring of the 7th Environment Action Programme, EEA report No30/2016, European Environment Agency