European Environment Agency

*Indicator Fact Sheet*

# (WQ05) Water prices

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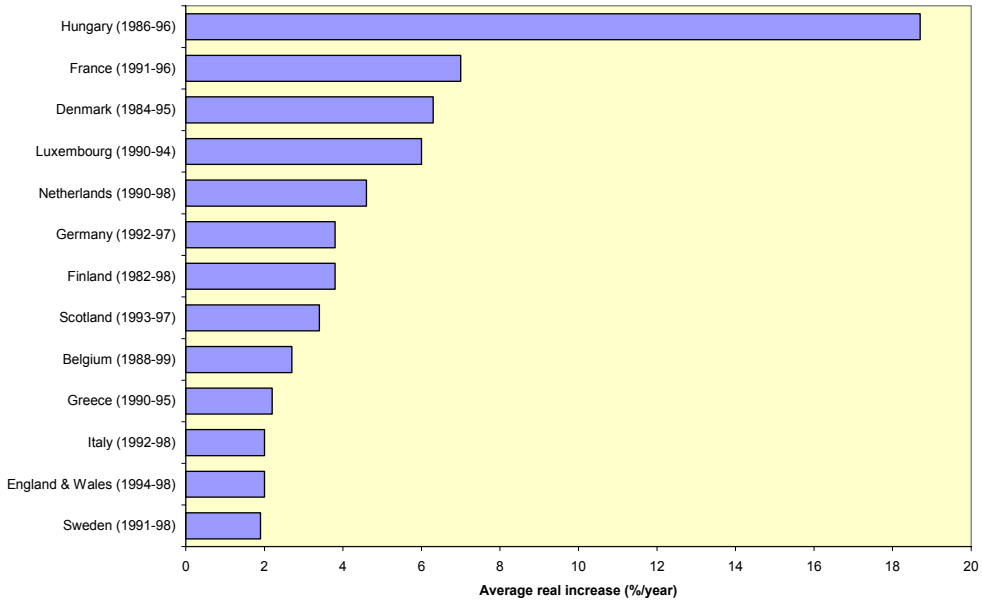
**Key message**

☺ Many countries have made significant progress towards more effective water pricing policies.

😐 However, far less progress has been made in the agricultural sector compared to the domestic and industrial sectors.

**Figure 1. Average annual increase in household water bills during the 1990s in some European countries.**




Notes: Average household combined sewage and water bills, except for Germany and Luxembourg where data relate only to public water supply. Total increases over the period for each country were converted using Consumer Price Index to 'real' changes which are then expressed as annual equivalents.

Source: OECD, 2001.

**Results and assessment**

Policy relevance

Article 9 of the Water Framework Directive (WFD) obliges Member States to ensure, by 2010, that water-pricing policies recover the costs of water services and provide adequate incentives for the sustainable use of water resources to thereby contribute to the environmental objectives of this Directive. Full-cost recovery will be a significant move towards the more sustainable use of water resources.

Policy context

Appropriate water pricing based on the integration of sound social, economic and environmental principles contributes to the development of sustainable water policies. Water pricing policy needs to be consistent with other sectoral, structural and cohesion policies. Reconciling water

and agriculture is a key priority for the Common Agricultural Policy (CAP) and other related policy instruments.

Environmental context

Excessive water use and wastewater discharges can have a negative impact on the water environment. Consequently, water is a major concern of environmental policies and is an environmental priority, although assigning a value to environmental damage or resources scarcity components is a major challenge. An appropriate water-pricing policy that takes into account local environmental and socio-economic conditions and the full recovery of costs in each water sector provides a clear incentive for water users to improve water use and reduce pollution to thereby meet environmental objectives. However, direct comparisons are difficult due to the wide variations in water charges within and between individual countries or sectors (see Sub-Indicators). Price elasticity comparisons within each water sector at the pan-European scale are complex due to the diversity of water pricing policies, water management systems and influence of other water demand management measures.

Assessment

Most countries are changing to water pricing systems that encourage economic efficiency and more sustainable use of water resources. However, the integration of economic and environmental objectives into the water pricing policies of individual Member States is still diverse and whilst transparent full cost recovery is being increasingly accepted this has only been partly achieved.

Increased water prices are more important as an enabling measure to produce a behavioural response. Demand for water is relatively inelastic to changes in price and few large-scale studies have demonstrated a clear link between water prices and a percentage reduction in water use. Nonetheless, evidence suggests that all users alter their water consumption patterns in response to water charges, metering penetration and seasonal pricing (price elasticity), although prices in the domestic and industrial sectors are usually an order of magnitude higher than for agriculture.

There has been a general trend towards higher water prices in real terms throughout Europe (e.g. domestic sector, Figure 1). Most countries use tariffs with fixed and volumetric components. Increasing water prices, as an economic signal, are having a positive impact on water use awareness in the domestic sector, particularly where previously subsidised, such as Eastern Europe where pricing systems are based almost entirely on volumetric pricing. For example, in Czech Republic water use fell from 171 to 116 l/cap/d between 1989 and 1996 when above inflation charges were introduced in 1993 to cover operating costs, and in Estonia a fivefold increase in water prices between 1994 and 1999 produced a noticeable reduction in domestic water use. In Hungary, water prices increased from 0.2 Euro to 0.5 Euro/$m^3$ after subsidies were removed in 1992 which led to a decline in water use of about one-third by 1996. However, water bills usually represent a very small percentage of household income or of GDP per capita, which range from 0.2% in Oslo to 3.5% in Bucharest in 1996 (World Bank considers that the cost of water services should not exceed 5% of household income).

Some countries have introduced water taxes as part of their water charges (e.g. Germany), in part to reflect the environmental cost of abstraction and use. However, there is no consistent and comparable approach to define the charges required to recover the costs of water protection and the improvement of aquatic systems. ‘Social’ tariff structures, which can contribute to both economic and environmental objectives, are being introduced in response to concerns about affordable water supplies. In one area of Belgium, for example, ‘free minimum’ amounts of water (first 15 $m^3$) to poorer households are based on the number of people living in that household rather than on the household as a unit, which is more commonly the case.

## Sub-indicators

### Water prices in different economic sectors

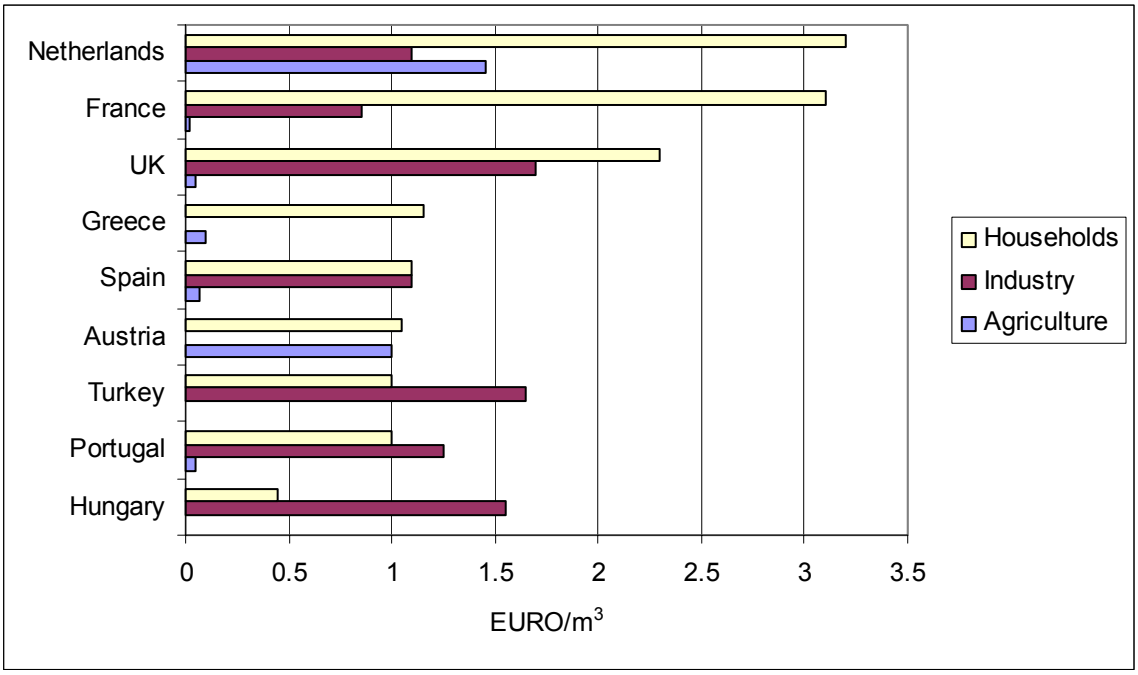
**Key messages**

☺ Domestic: Increasing water prices are raising awareness of water use efficiency.

😐 Industry: Water saving technology is being introduced, but comparative information is generally lacking.

☹ Agriculture: Water prices are still widely subsidised

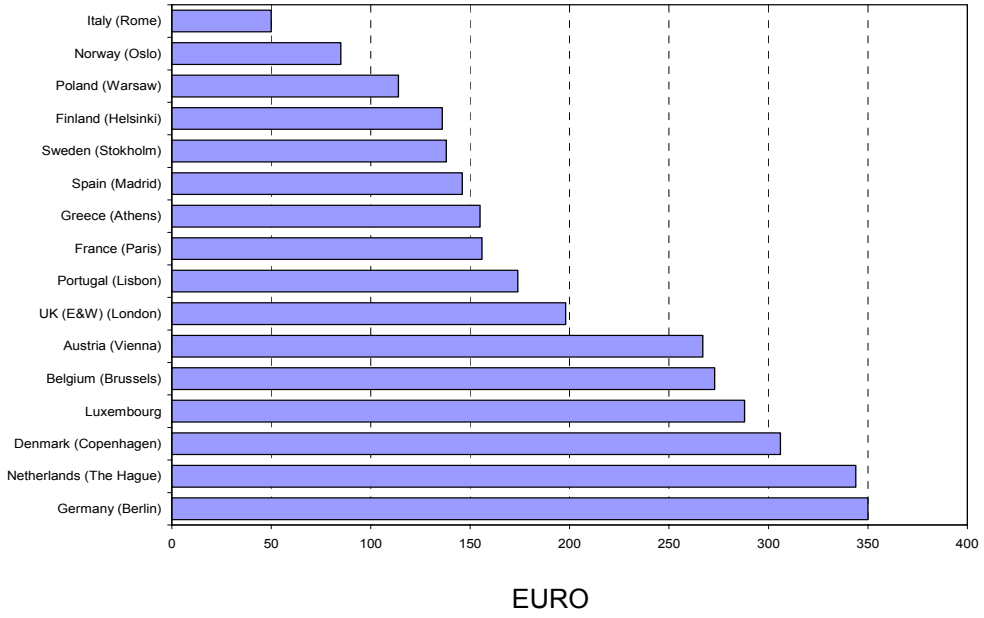
**Comparison of agricultural, industrial and household water prices in late 1990s**




Notes: Median values for range of prices are shown in each category and should be considered as indicative only.

Source: OECD 1999, 2000, 2001

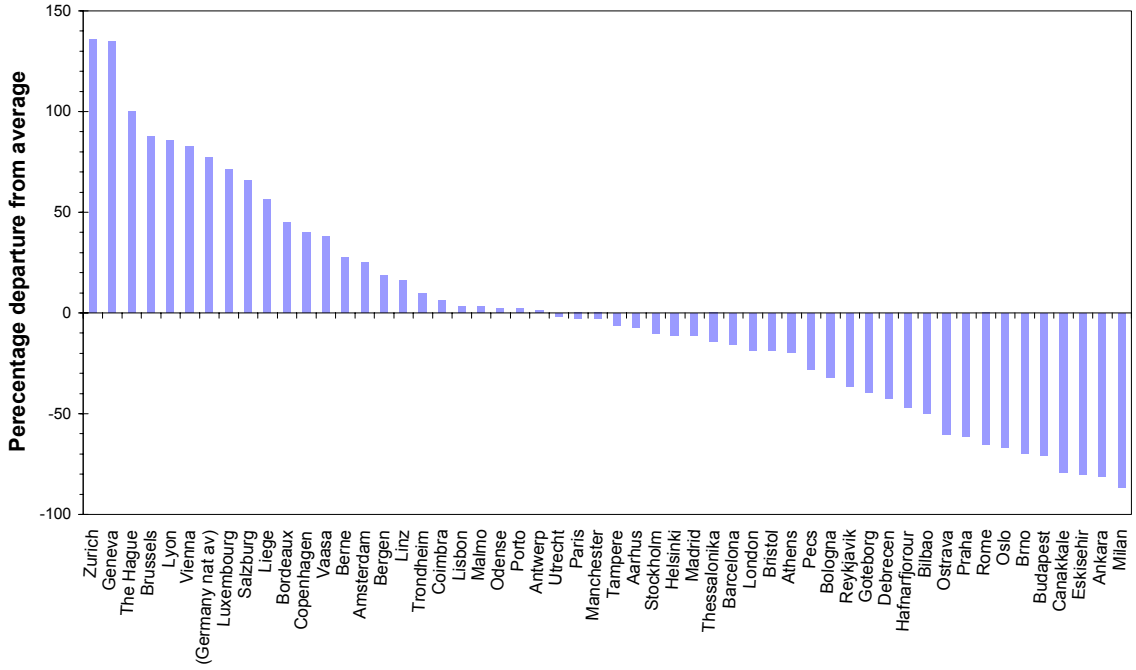
**Figure 2. Typical water prices in some European countries in 1998**




Notes: Prices are shown for a typical household consumption of 200 $m^3$/y

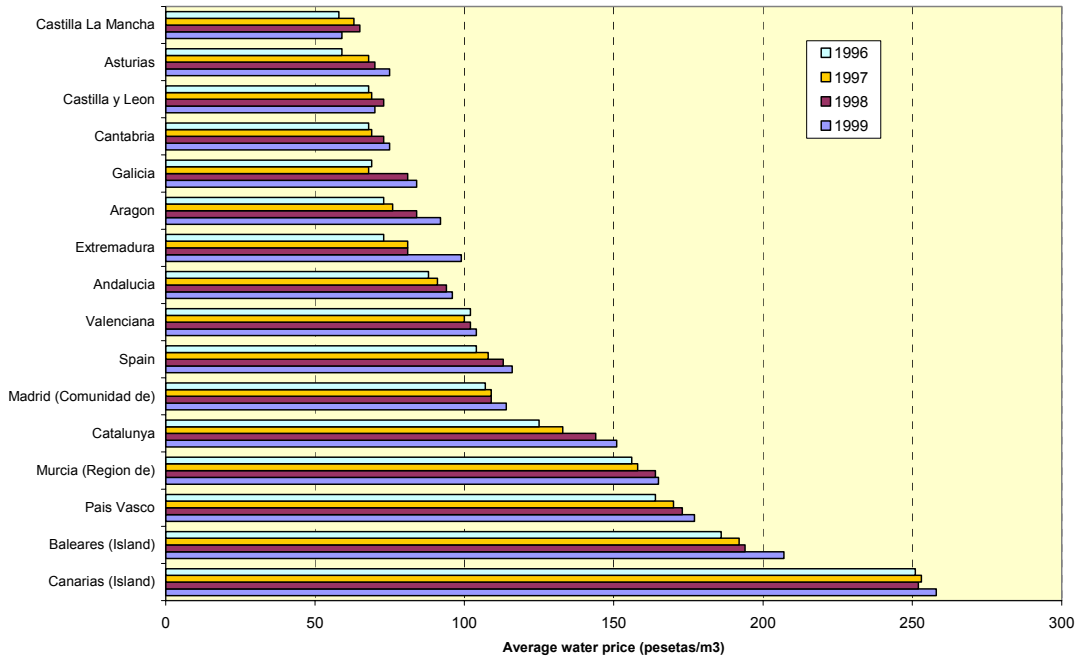
Data source: OECD, 1999

**Figure 3. Percentage departure from average in water prices (Euro/$m^3$) for major cities in 1996**




Data source: OECD 1999, based on IWSA/AIDE

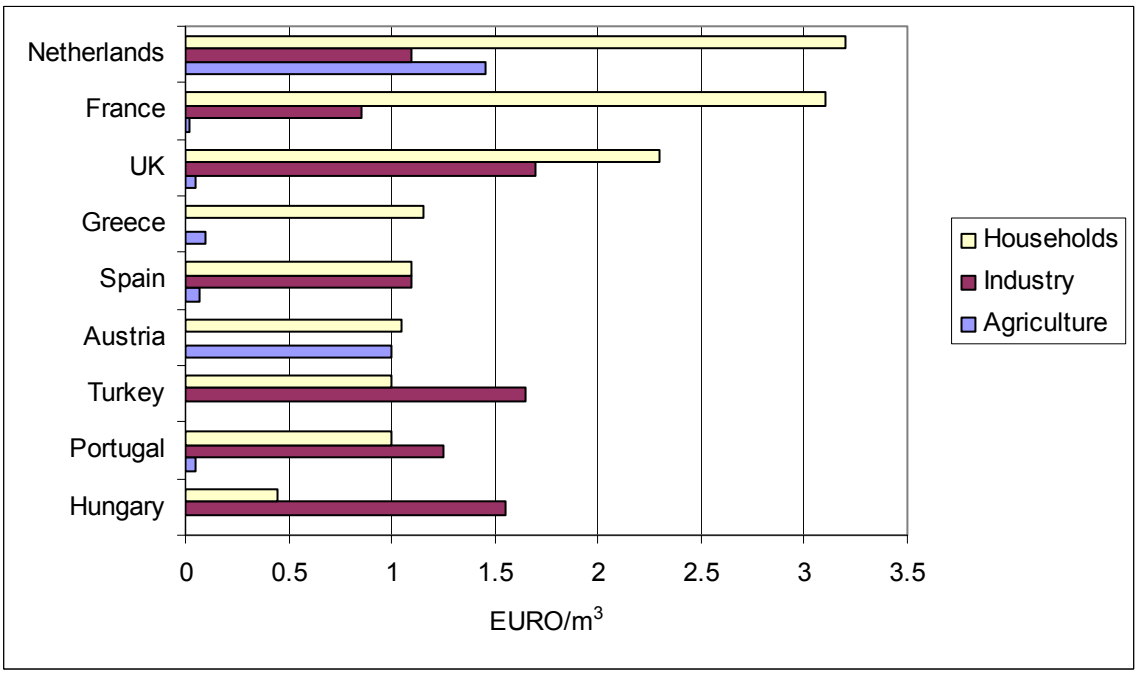
**Figure 4. Water prices in Spain between 1996 and 1999**




Notes: Data for 1996 to 1999 (in pesetas).

Source: Environmental statistics, 1999 (INE National Statistics Office).

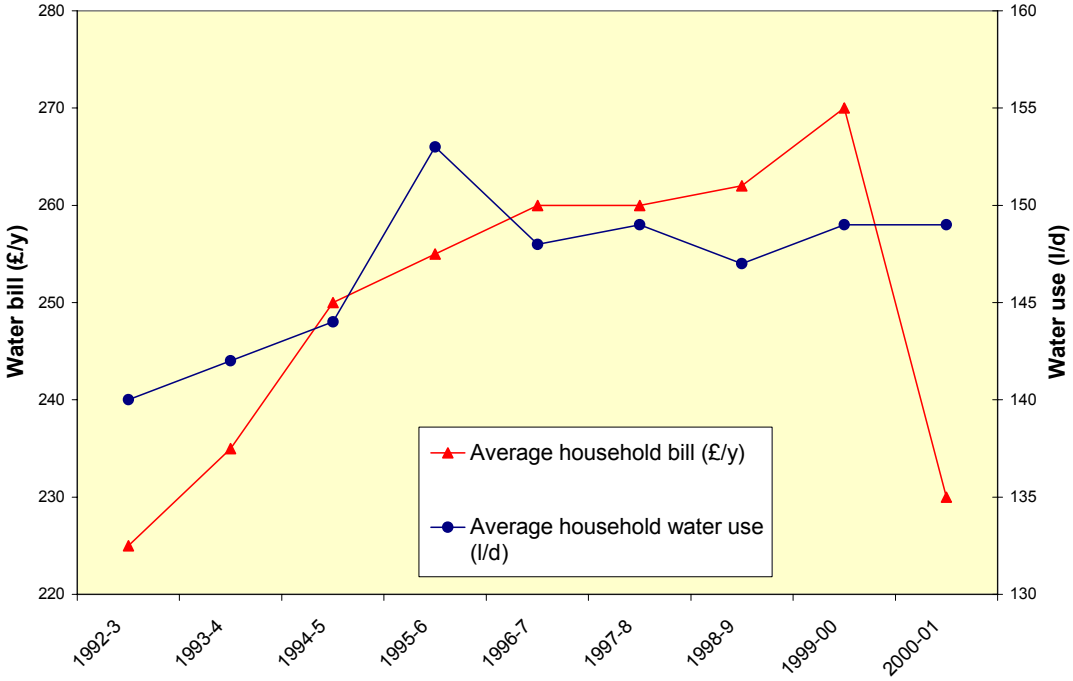
**Figure 5. Comparison of agricultural, industrial and household water prices in some European countries in the late 1990s**

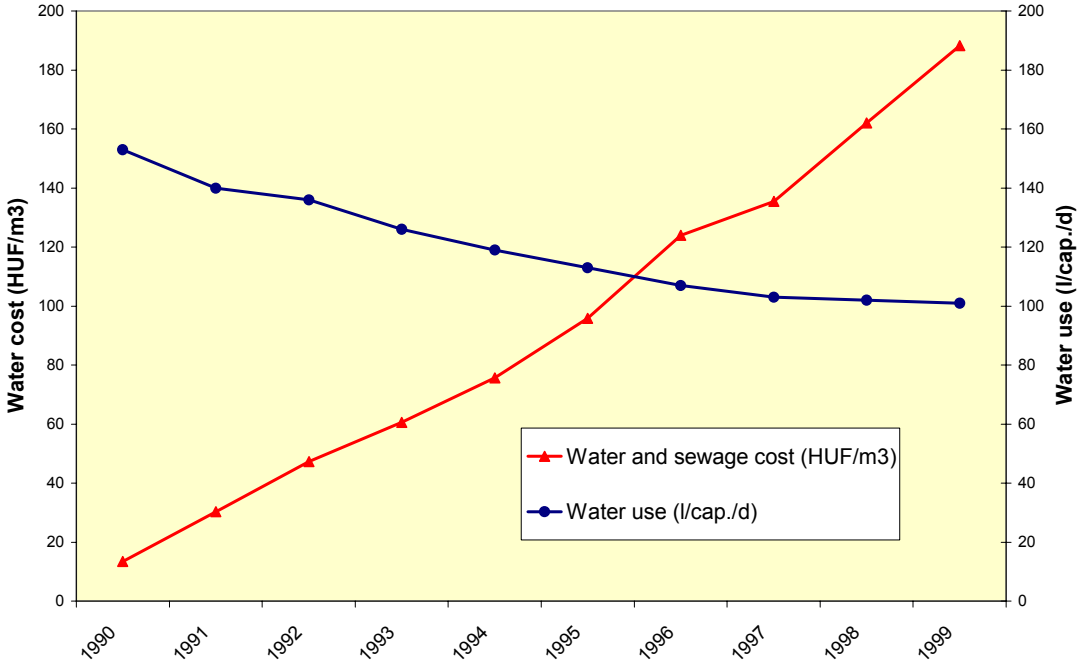



Notes: Median values for range of prices are shown in each category and should be considered as indicative only.

Source: OECD 1999, 2000, 2001.

**Figure 6. Trends in water bills and water use in a) England and Wales and b) Hungary**




Notes: (a) Costs rounded and adjusted to 2001-2 prices. Water use is for non-metered supplies.

Data source: (a) DEFRA, EA, Ofwat; (b) OECD, 2001

**Assessment of the sub-indicators**

1. *Domestic water prices in different countries*.

Water prices vary considerably across Europe. Figure 2 shows real prices for selected countries and Figure 3 the departure from average for 54 major cities in 20 countries. Milan and major cities in Turkey have the lowest water prices, about 75% below the average. Many cities in Mediterranean countries also have below average water prices, as do those in countries with abundant water supplies. In contrast water prices are highest in northern European cities (about 75-100% higher than the average).

2. *Trends in domestic water prices*

Wide variations in real price increases have occurred between countries and within individual countries. Figure 3 shows the percentage change in prices compared to average in selected countries between 1995 and 1998. Figure 4 illustrates the wide disparity in water prices in Spain, where, for example, prices in tourist resort islands are 2 to 2.5 times the national average. Prices increased by an average of about 13% (range 1.7 to 35.6%) over a three-year period between 1996 and 1999, exceeding 20% in five of the regions.

3. *Water prices in different sectors*

Comparisons between water sectors are difficult due, for example, to the range of water tariffs or source of supply and in some countries where irrigation is a major water user prices may be based on surface area. An indication of agricultural, industrial and household water prices for some European countries is given in Figure 5. Agricultural water prices are considerably lower than those in industry or households generally due to the lower quality of water supplied and lower capital costs.

4. *Impact of water prices on domestic water use*

The impact of higher prices on water consumption (price elasticity) will vary in each country and with time. Examples are shown in Figure 6(a) for England and Wales (1992-2000/1) and Figure 6(b) for Hungary (1990-1999).

In England and Wales, where full-cost recovery has applied since privatisation of the water industry in 1989, the annual average household water bill has risen by about one-third since privatisation, although this still represents only about 1% of average household income. Domestic water consumption, however, continued to rise but has remained at about 149 l/cap./d over the past few years, within the low range for European countries. Water use by metered customers is about 10% less than non-metered customers, but meter penetration, whilst increasing, is still only about 13%: water bills are to fall over the next two years.

The marked decrease in water use in Hungary is due to large real price increases (see also Figure 1) that reflect the net effects of significant reductions in subsidies after 1992, infrastructure improvements and reduced water use that needed higher unit charges to recover total costs. Despite continuing price rises, however, the effect on consumption has been limited since 1998.

(See more complete assessment in the main indicator)

See also fact-sheets: Water use efficiency, Water use in urban areas, Mean water allocation for irrigation, Sectoral water use.

**References**

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**Data**

Spreadsheets:

Water prices_RevOct03.xls

WatPrices_CountryOct03.xls

**Meta data**

Technical information

1. Data sources: OECD, EEA, IWSA and National Statistical Offices.
2. Description of data: Prices for public water supply in capitals/major cities expressed in EUR for a typical annual household consumption of 200 $m^3$/y. Total increases over the period for each country were converted using Consumer Price Index to 'real' changes which are then expressed as annual equivalents. Average household combined sewage and water bills, except for Germany and Luxembourg where data relate only to public water supply. Data are mainly available for 1996 and 1998 and are incomplete for other years.
3. Geographical coverage: EEA
4. Temporal coverage: Years 1995, 1996, 1997, 1998
5. Methodology and frequency of data collection: No established routine. IWSA presents information supplied by water company members at two-year intervals.
6. Methodology of data manipulation, including making 'early estimates': Data from various sources expressed in price/$m^3$ have been converted to EUR at exchange rates for mid-2002 and standardised to a common household annual water use.

Quality information

7. Strength and weakness (at data level): There is no mandatory requirement for the collection of data on water prices across Europe. Comparability is limited by large variations in water prices and in the individual components of water charges among and within individual countries.
8. Reliability, accuracy, robustness, uncertainty (at data level): Data are incomplete and should be considered as indicative only as water prices may include recovery from other sources and subsidies. Water prices for industrial users using public water supplies are often confidential and on average about 75% of industry is self-supplied. Data at the national level do not reflect local water stress. Price elasticity highly variable and uncertain and consequently the extent to which increased water prices alone contribute to a continued reduction in water use (price elasticity) cannot be determined from the available data on water prices at the pan-European scale. Water prices, in themselves, are of limited value as a reliable indicator of water savings as the savings that can be attributed directly to price increases cannot usually be distinguished from other water demand management measures. In addition, prices over the past decade have risen more quickly in order to increase the investment in the water distribution system, to meet the requirements of EU Directives to improve water quality and from the removal of subsidies. Water prices are

based on a range of different factors and direct comparisons both temporally and spatially are difficult. Domestic water usein UK and Norway is mainly non-metered.

9. Overall scoring: 3=major reservations

Relevancy: 2

Accuracy: 3

Comparability over time: 3

**Further work required**

Recent OECD reports have highlighted the difficulty in obtaining consistent and reliable data on water prices at both temporal and spatial levels, particularly for industry. New approaches are being developed to allow consistent comparisons in water prices but further work is still required on the price elasticity of demand (PED), a measure of responsiveness of the quantity demanded to a change in its price. Water prices need to take account of marginal costs and incorporate better demand analyses.

Water prices are only one of a range of water demand management measures. Greater emphasis should be placed on determining the net effect of these measures on different users and to develop a more appropriate response indicator at the basin/catchment level. This should focus on localities and users where the benefits in water savings are greater, such as the agricultural sector.