



# ECOTAPWARE

## Task 2: Economic and market analysis Task 3: User behaviour

September 2011

# Table of contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
1.1	Project Background	3
1.2	Product Definition	4
<b>2</b>	<b>Economic and Market Analysis</b>	<b>6</b>
2.1	Generic Economic Data	6
2.2	Market and Stock Data	20
2.3	Market and Production Structures	32
2.4	User Expenditure Base Data	39
2.5	Specific Issues related to Ecolabel and GPP Schemes	47
<b>3</b>	<b>Task 2 - User behaviour</b>	<b>52</b>
3.1	Introduction	52
3.2	Subtask 2.1 – User Information	57
3.3	Subtask 2.2 – User behaviour in the use phase	59

Appendix 1 – Intra and Extra Trade Data

# 1 Introduction

## 1.1 Project Background

The Joint Research Centre's Institute for Prospective Technological Studies (JRC-IPTS) with support from AEA, is conducting a pilot study to develop a joint evidence base and related product policy measures in the area of water using products for the European Commission's Directorate General for the Environment.

The purpose of this pilot project is to provide relevant data and information from which EU policy making in the area of water using products can be developed. In this project, EU Ecolabel and Green Public Procurement criteria will be devised for taps and showerheads. In addition, the evidence base will gather information and data to assist the potential development of Implementing Measures under the Ecodesign Directive in the future. However, implementing measures for taps and showerheads will not be developed as part of this project.

Further details regarding the project are available through the following website:

<http://susproc.jrc.ec.europa.eu/ecotapware/index.html>

The evidence base is being gathered in line with the MEEuP tool methodology. JRC working with Commission colleagues developed Task 1 of the MEEuP methodology – the product group definition and scope. This report outlines the initial results for Task 2 (Economic and Market Analysis) and Task 3 (User Behaviour).

Task 2 carries out an analysis of the market for taps and showerheads and focuses on:

- Identifying the production for each product for the EU, looking at number of units that are produced within the EU and imports into the EU
- Identifying the EU market size in term of products sold and products already installed (the stock)
- Understanding the market and production structure: which countries are the largest producers, buyers, importers of the product group; who are the largest producers, what are the current trends of product development
- Quantifying user expenditure

Task 3 focuses on user behaviour, it concentrates on identifying what information current labels provides to users, how behaviour can be influenced, and seeks to understand what manufacturers are currently doing to better inform consumers. It also considers usage patterns by the end users.

To inform these two tasks and develop the evidence base a questionnaire was produced and distributed to a range of stakeholders. The questionnaire was designed to capture stakeholder remarks on the product group definition, product classification, market data, environmental performance, product development and consumer behaviour.

Given the importance of stakeholder involvement in the development of ecolabel and GPP proposals, the next step will be to expose this interim report to stakeholder scrutiny. Their feedback will assist the team to update Tasks 2 and 3 such that the work programme can move forward to Task 4, development of the product base cases.

## 1.2 Product Definition

The product definition developed and included in the questionnaire for stakeholder review was:

- *Tap - “a small diameter manually operated valve from which water is drawn”*
- *Showerheads - either a “fixed overhead shower outlet which directs water onto the user” or a “moveable hand held shower outlet which is connected to the sanitary tapware via a shower hose and can be hung directly on the tapware or on the wall with the aid of an appropriate support”*

***In both cases the product scope applies to products of the type typically used in a domestic setting.***

Our intention is to develop a definition that excludes special purpose equipment such as laboratory safety showers, the use and purpose of which is very different to products used in the home and similar environments.

Please note that non-domestic premises include premises such as restaurants, schools, sport centres, hospitals, offices, public buildings and so on.

In response to the first questionnaire a number of stakeholder remarks were noted:

- Bath tapware should be excluded as their primary focus is to fill a vessel as fast as possible. If the flow rate was to be too slow, this could impact on bath water temperature requiring further hot water to top it up.
  - *We agree and will reflect this in an updated definition.*
- Kitchen tapware has numerous functions, including filling vessels, washing hands, rinsing pots and pans. The duration of use and flow rate differs for each of these uses and may need attention when describing consumer behaviour.
  - *The point is noted and will receive appropriate attention when defining the bases case.*
- “Manually operated” means that tapware that are activated automatically via movement sensors will be excluded. This type of product, stakeholders remarked, aims to save water and energy by controlling the length of time a tap is left on.
  - *The point is noted and the definition has been revised to reflect this with reference to ‘directly and indirectly manually operated’. The bulk of taps sold we suspect are of the manually operated variety and automatically operated taps may be Best Available Technology (BAT) solution.*
- The term overhead showers excludes fixed side showers
  - *The definition now includes reference to ‘side shower’.*
- The definition is unclear regarding the inclusion of domestic versus non domestic products
  - *A fair point warranting clarification. From the information available to us, we understand that the products a domestic consumer would buy for their home are also used in a school, hospital, commercial office or industrial building setting. Therefore the product definition encompasses these end uses as well as domestic homes via the phrase ‘of the type typically used in a domestic setting’. There are of course, taps and showerheads of a design specifically made for use in hospitals, industrial buildings and the like, i.e. designs that one would not expect to find in domestic homes, and it is these that are excluded from the study.*

In response to the feedback received, the definition has been updated. The latest definition is shown in Box 1 below.

## Box 1: Product Definition

**Tap** - “a small diameter directly or indirectly manually operated valve from which water is drawn”.

**Showerhead** - either a “fixed overhead or side shower outlet which directs water onto the user” or a “moveable hand held shower outlet which is connected to the sanitary tapware via a shower hose and can be hung directly on the tapware or on the wall with the aid of an appropriate support (also known as a shower handset)”.

In both cases the product scope applies to products of the type typically used in a domestic setting (This is not restricted to the use of products for domestic uses only, it also includes similar non domestic uses of the products)

Bathtub taps and non-domestic special purpose taps and showerheads which need unrestricted water flow to fulfil the intended function (e.g. laboratory safety taps and showers) are excluded from the product scope.

Following feedback from stakeholders, the definition of showerheads and explanatory note have been revised slightly, the revised definitions and notes, included in the second questionnaire for the base case assessment data gathering exercise are as follows:

**Tap** - “a small diameter directly or indirectly manually operated valve from which water is drawn”.

**Showerhead** - either a “fixed overhead or side shower outlet (or body jet or similar device), which may be adjustable, and which directs water onto the user” or a “moveable hand held shower outlet which is connected to the sanitary tapware via a shower hose and can be hung directly on the tapware or on the wall with the aid of an appropriate support (also known as a shower handset)”.

In both cases the product scope applies to products of the type typically used for a domestic function (This is not restricted to the use of products for domestic uses only, it also includes products for similar non domestic uses e.g. in schools, sport centres etc)

Bathtub taps and non-domestic special purpose taps and showerheads which need unrestricted water flow to fulfil the intended function (e.g. laboratory safety taps and showers) are excluded from the product scope.

## 2 Economic and Market Analysis

Task 2 focuses on a market analysis for Taps and Showerheads for the European Union. The analysis concerns domestic and non-domestic premises.

The first part of the analysis uses official EU statistics to establish the level of production within the EU and individual member states (MS), trade, through import and export data, comments on the overall market size and identifies those MS that are the key players on this product market. In addition, it looks at market and stock data to calculate sales.

The second part of the analysis focuses on the product design and related market characteristics and trends. For taps and showerheads we present the available data relating to product trends, market structure and its characteristics. An indication of typical products available is included together with a comment on new products entering the market.

### 2.1 Generic Economic Data

#### 2.1.1 Introduction

This section describes the data derived from official EU statistics regarding the products under investigation and aims to estimate the apparent EU consumption of these products based on the formula:

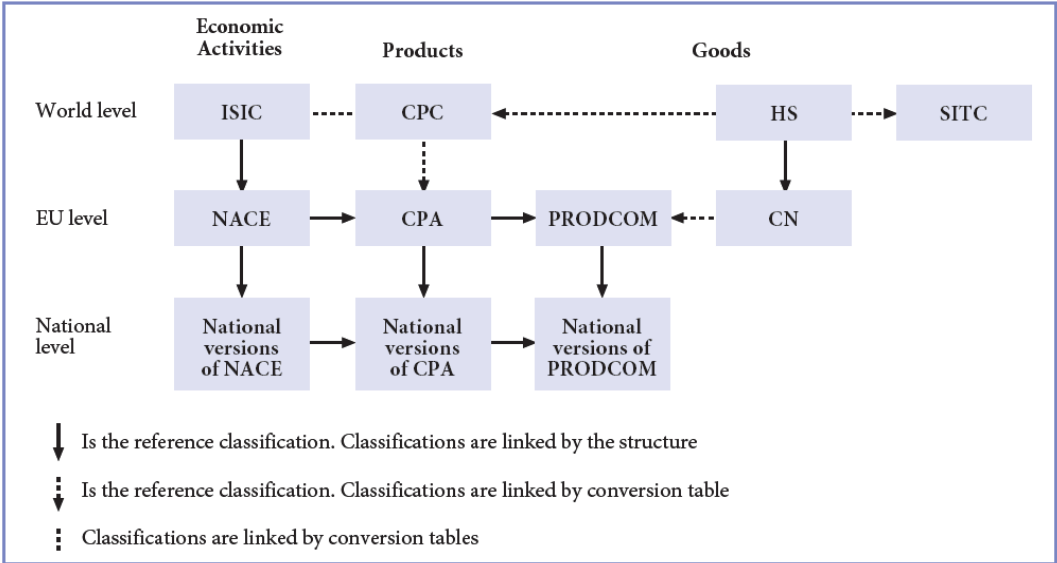
- $\text{Sales in EU-27} = \text{Production in EU-27} - \text{export to third countries (from EU-27)} + \text{imports from third countries (to EU-27)}$

Limitations in the transparency of the EU statistics mean that a number of assumptions and calculations have been made. These are outlined in the appropriate sections below.

For production statistics the PRODCOM categorisation was used while for statistics on export and imports the study team used the Combined Nomenclature (CN) codes.

The basic building blocks for PRODCOM are NACE, the European standard classification of productive economic activities. NACE is part of an integrated system of statistical classifications, developed mainly under the auspices of the United Nations (UN) Statistical Division. From the European point of view, this system can be represented as follows:

**Figure 1: International System of Classifications**



Where:

- **ISIC** is the United Nations’ International Standard Industrial Classification of all Economic Activities.
- **CPC** is the United Nations’ Central Product Classification.
- **HS** is the Harmonized Commodity Description and Coding System, managed by the World Customs Organisation.
- **CPA** is the European Classification of Products by Activity.

A number of revisions to NACE have been made over the years. PRODCOM data for 2005, 2006 & 2007 have been reported under NACE Rev. 1. However, data for 2008 and onwards are now reported under NACE Rev. 2. Thus, the data for 2008 is not strictly comparable with the data for the previous years, and a judgement has been taken for selecting product codes with comparable descriptions.

PRODCOM is a system for the collection and dissemination of statistics on the production of manufacturing goods. The title comes from the French “PRODUCTION COMMUNAUTAIRE” (Community Production) and aims to harmonise within the European Union the various ways industrial statistics are collected. Each manufacturing product is classified by an 8-digit code and all together aggregated in a database that is updated on an annual basis. For those products that are manufactured within a MS’s territory a MS should report on: (1) the value of production in Euros, (2) the volume sold in thousands of units and (3) the total weight in thousands of kilograms. It should be noted that National Statistical Institutes in each MS are not required to survey businesses with less than 20 employees. Thus it is impossible to know whether 100% of the production has been reported or indeed the percentage of production that has been reported. However in the context of sanitary ware, the market is of mass production, and small businesses would be more likely to be marketing bespoke and high end products.

Combined Nomenclature (CN) is a system for the collection and dissemination of statistics on EU trade. The system is used by the European Union for statistical and tariff purposes and is linked to the 6-digit harmonised system used by the majority of trading nations throughout the world. Products are classified by an 8-digit code and data on the value (Euro) of trades (internal and external) as well as on the quantity (kg) traded are displayed.

PRODCOM statistics have to be comparable with external trade statistic (CN). For that reason Eurostat publishes a list on an annual basis with the CN codes and the corresponding PRODCOM codes to define the relationship between the two nomenclatures. For each PRODCOM code one or more CN code corresponds.

Concerning sanitary ware and tapware, the PRODCOM categories identified in Task 1 of this study and their corresponding CN codes are displayed in Table 1.

**Table 1: 2009 Combined Nomenclature with corresponding PRODCOM codes<sup>1</sup>**

Codes		Description
<b>CN</b>	8481 80 11	Mixing valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures
<b>Prodcom</b>	28.14.12.33	Mixing valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure reducing or oleohydraulic/pneumatic power transmissions, check valves, safety/relief valves
<b>CN</b>	8481 80 19	Taps, cocks and valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures (excl. Mixing valves)
<b>Prodcom</b>	28.14.12.35	Taps, cocks and valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure-reducing/oleohydraulic transmissions, check, safety, relief and mixing valves
<b>CN</b>	7324 90 00	Sanitary ware, incl. parts thereof (excl. cans, boxes and similar containers of heading 7310, small wall cabinets for medical supplies or toiletries and other furniture of chapter 94, and fittings, complete sinks and washbasins, of stainless steel, complete baths and fittings)
<b>Prodcom</b>	25.99.11.31	Sanitary ware and parts of sanitary ware of iron or steel
<b>CN</b>	7418 20 00	Sanitary ware and parts thereof, of copper (excl. cooking and heating appliances of heading 7417, and fittings)
<b>Prodcom</b>	25.99.11.35	Sanitary ware and parts thereof of copper
<b>CN</b>	7615 20 00	Sanitary ware and parts thereof, of aluminium (excl. cans, boxes and similar containers of heading 7612, and fittings)
<b>Prodcom</b>	25.99.11.37	Sanitary ware and parts thereof of aluminium
<b>CN</b>	6910 90 00	Ceramic sinks, washbasins, washbasin pedestals, baths, bidets, water closet pans, flushing cisterns, urinals and similar sanitary fixtures (excl. of porcelain or china, soap dishes, sponge holders, tooth-brush holders, towel hooks and toilet paper holders)
<b>Prodcom</b>	23.42.10.50	Ceramic sinks, wash basins, baths... and other sanitary fixtures, n.e.c.
<b>CN</b>	6910 10 00	Ceramic sinks, washbasins, washbasin pedestals, baths, bidets, water closet pans, flushing cisterns, urinals and similar sanitary fixtures of porcelain or china (excl. soap dishes, sponge holders, tooth-brush holders, towel hooks and toilet paper holders)
<b>Prodcom</b>	23.42.10.30	Ceramic sinks, etc and other sanitary fixtures, of porcelain or china
<b>CN</b>	3922 90 00	Bidets, lavatory pans, flushing cisterns and similar sanitary ware, of plastics (excl. baths, shower-baths, sinks, washbasins, lavatory seats and covers)
<b>Prodcom</b>	22.23.12.90	Plastic bidets, lavatory pans, flushing cisterns and similar sanitary ware (excluding baths, showers-baths, sinks and wash-basins, lavatory seats and covers)
<b>CN</b>	3922 10 00	Baths, shower-baths, sinks and washbasins, of plastics
<b>Prodcom</b>	22.23.12.50	Plastic baths, shower-baths, sinks and wash-basins

From Table 1 it is clear that PRODCOM and CN codes do not include a clear product category for taps and showerheads. For showerheads it is difficult to identify which category they are reported in while taps are aggregated together with other items (e.g. industrial valves or valves and taps for other purposes) into one or two categories.

Discussion with the UK's Office of National Statistics (ONS) and manufacture associations of taps and showerheads around Europe revealed that they only use the first two codes for the purposes of reporting taps and showerheads. These are shown in Table 2.

<sup>1</sup> The 2008 'CN with corresponding PRODCOM codes' list is the same as this for 2009



**Table 2: Taps and Showerheads - 2009 CN with corresponding PRODCOM codes**

Codes		Description
CN	8481 80 11	Mixing valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures
PRODCOM	28.14.12.33	Mixing valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure reducing or oleohydraulic/pneumatic power transmissions, check valves, safety/relief valves
CN	8481 80 19	Taps, cocks and valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures (excl. Mixing valves)
PRODCOM	28.14.12.35	Taps, cocks and valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure-reducing/oleohydraulic transmissions, check, safety, relief and mixing valves

Based on comments received, we propose to use the codes in Table 2 for this study.

### 2.1.2 EU Production

Based on our findings as outlined in Section 2.1.1, two of the PRODCOM categories identified in Task 1 of this study have been assessed:

- **28.14.12.33** Mixing valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure reducing or oleohydraulic/pneumatic power transmissions, check valves, safety/relief valves
- **28.14.12.35** Taps, cocks and valves for sinks, wash basins, bidets, water cisterns etc excluding valves for pressure-reducing/oleohydraulic transmissions, check, safety, relief and mixing valves

Table 3 below presents the production for these two specific codes across all MS. It can be seen that:

- For code **28.14.12.33**, Italy and Germany were by far the largest producers in terms of mass of product followed by Portugal and Spain. Looking at the value of the production, Germany was leading followed by Italy.
- For code **28.14.12.35** Italy was again the largest producer followed by France and Spain. However, looking at the value of the production in euros, it appears that Italy led the way, followed by France.

Looking carefully at the ratio of mass to value it can be seen that some Member States seem to be producing higher value products than other, for example for code **28.14.12.33**, Italy's production is just 2% higher than that of Germany, however Germany's production value is 40% higher than that of Italy. This highlights the differences between the number of units sold (by weight) and monetary value of each unit produce.

What the table shows is that there is a distinct difference in the value per kg of products in the two categories which is common for all reporting member states. This information has been collated as required by the EuP methodology and is used to characterise the market characteristics. In addition to the lack of transparency, which has already been highlighted, there are data gaps due to confidentiality issues and some variation in the ratio between volumes sold in thousands of kilograms and value in millions of Euros, suggesting the data is unreliable and at best indicative.

It is important to note that the specific Prodcom codes relevant to this project are provided in kg and EURO, and not as number of units sold. In addition data is not reported for some countries due to confidentiality issues.

As outlined in section 2.1.1, Prodcom reporting has been slightly changed in the last couple of years using NACE 1 and NACE 2. Unfortunately this means that there are not straightforward comparisons with the codes prior to 2008, thus preventing us from reviewing how the production has changed over recent years.

**Table 3: Production, Sold volume in Thousands kilos/Value in Million Euros– 2008**

	28.14.12.33		28.14.12.35	
	kg	Euro	kg	Euro
EU-27*	133,042	2,722	218,058	2,400
Austria	:C	:C	:C	:C
Belgium	-	-	:C	:C
Bulgaria	:C	:C	229	2
Cyprus	-	-	-	-
Czech Republic	3,527	27	:C	20
Denmark	1,215	97	-	-
Estonia	-	-	-	-
Finland	3,447	92	:E	5
France	1,154	41	9,576	208
Germany	37,851	968	:C	:C
Greece	-	-	-	-
Hungary	:C	:C	346	4
Ireland	-	-	-	-
Italy	38,668	687	76,421	955
Latvia	-	-	-	-
Lithuania	248	3	557	:E
Luxembourg	-	-	-	-
Malta	-	-	-	-
Poland	3,888	68	:C	31
Portugal	13,144	224	1,339	11
Romania	:C	:C	565	4
Slovakia	-	-	1,025	13
Slovenia	:C	:C	:C	:C
Spain	10,585	160	7,819	57
Sweden	2,514	79	:C	:C
The Netherlands	:E	:C	:E	:C
The United Kingdom	:E	72	:E	101

\* Note that the EU 27 total includes estimates and confidential data not published here.

(:C)=Confidential, (:CE)=Confidential Estimated, (:E)=Estimated

All sold volumes are expressed in thousands

To be able to convert the above production data from kg to product units there is a need to establish two key parameters. Firstly the average weight of the different product types, and secondly the percentage split/ratio of the different products reported under the two Prodcom codes identified. This information can then be used to provide an estimate of production in terms of product units.

It is important to note that this calculation will only provide a baseline estimate and is based on the assumptions outlined below.

Publicly available data of the average weight of products is limited; however research of manufacturer’s product catalogues and other similar sources has enabled the assessment in Table 4 to be made<sup>2</sup>.

**Table 4: Average product Weights (kg)**

<b>Product</b>	<b>Average Weight (kg)</b>
Kitchen Taps	2.2
Bathroom basin taps	1.8
Average for taps	2.0
Shower heads	0.4

It is important to remember that the Prodcom codes used here are not solely reporting data on taps and showerheads but include other sanitary ware products. To date the research and stakeholder feedback received has not provided any information on the ratio of different products reported under the Prodcom codes identified.

The stock model in Section 2.2, built up from the available information and our assumptions, indicates an approximate split of 25% showerheads and 75% taps in terms of units. In order to meet the calculated stock it has been assumed production and consumption follows the same split.

To make an initial calculation of units from the kg data provided in Prodcom the following assumptions have been made.

- It is assumed that the weight reported in Prodcom is for taps and showerheads only
- That the two Prodcom codes contain data relevant to taps and showerheads.
- The data can be split in the ratio 25% showerheads and 75% taps in terms of units.
- The average weight of a tap is 2 kg and a showerhead is 0.4 kg.
- The weight of a single unit based on the ratio and weights outlined above is required. This has been calculated as 1.6 kg. This figure is used to calculate the total number of units from the aggregated kilogram figures provided by the Eurostat data. Once the total number of units is known the 25% showerheads and 75% taps ratio is applied to provide a breakdown between the two product types.

It should also be noted that for some countries the data is not available as it is considered confidential and for others the values seem relatively low or are reported as zero, which suggests reporting may not be consistent under the Prodcom codes between Member States for these products. The extent of this is not known.

On the basis of these assumptions the production figures in units, shown in table 5, have been calculated.

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<sup>2</sup> This assessment is based on a small number of products for which weight information was identified through on line retailers. The sample size was limited by the information available to nine kitchen taps, eight bathroom taps and twelve showerheads. Stakeholders are invited to comment on the average weights at the end of this section.

**Table 5: Calculated Production in Units (thousands of units)**

	Taps	Showerheads
EU-27	164,578	54,859
Austria	:C	:C
Belgium	:C	:C
Bulgaria	107*	36*
Cyprus	-	-
Czech Republic	1,653*	551*
Denmark	569*	190*
Estonia	-	-
Finland	1,616*	539*
France	5,030	1,677
Germany	17,743*	5,914*
Greece	-	-
Hungary	162*	54*
Ireland	-	-
Italy	53,948	17,983
Latvia	-	-
Lithuania	377	126
Luxembourg	-	-
Malta	-	-
Poland	1,823*	608*
Portugal	6,789	2,263
Romania	265*	88*
Slovakia	480*	160*
Slovenia	:C	:C
Spain	8,627	2,876
Sweden	1,179*	393*
The Netherlands	:E	:E
The United Kingdom	:E	:E

\* Incomplete data (data available for only one out of the two PRODCOM codes)

It is important that these assumptions are as well informed as possible in order to provide reasonable estimates. We welcome stakeholder comments in this regard and would be grateful for insights and data.

### 2.1.3 EU Trade

Table 6 below shows the Eurostat statistics on imports and exports, presenting the sum of EU27 Intra Europe<sup>3</sup> and Extra Europe<sup>4</sup> trade data for the following CN codes:

- **8481 80 11** Mixing valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures
- **8481 80 19** Taps, cocks and valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures (excl. Mixing valves)

<sup>3</sup> Intra Europe means the trade that is taking place between the Member States.

<sup>4</sup> Extra Europe means all trade that is taking place between Member States and other countries outside of Europe

For code **8481 80 11**

- the largest importers in 2008 were (in order) Germany, France, Italy and the UK, and it was the same countries that had the largest imports in term of monetary value
- the largest exporters were (in order) Germany, Italy, Portugal and Bulgaria. Again the same countries had the largest exports monetary value.

For Code **8481 80 19**

- The largest importer was the UK, followed by (in order) Germany, Italy and Spain. Again the same countries had the largest monetary value for imports
- The largest exporters were topped by Italy, followed (in order) by Germany, Spain and the UK. In terms of monetary value, the Italy had the greatest export value, followed by Germany, France and Spain.

**Table 6: Total Import/exports thousands kilos/Value in Million Euros– 2008**

country	8481 80 11		8481 80 11		8481 80 19		8481 80 19	
	Imports Kgs	Exports Kgs	Imports Euro	Exports Euro	Imports Kgs	Exports Kgs	Imports Euro	Exports Euro
EU27	139,682.0	127,130.3	1,951.3	2,340.9	76,453.4	44,534.6	820.5	706.6
Austria	4,564.2	3,991.8	74.3	52.8	2,000.2	512.4	30.3	7.3
Belgium	6,757.9	3,270.1	109.4	35.4	2,536.6	622.7	33.3	7.3
Bulgaria	1,160.5	8,218.1	10.8	110.6	599.9	10.5	4.2	0.1
Cyprus	544.9	5.1	8.1	0.1	159.7	0.5	1.7	0.0
Czech Republic	2,570.0	2,732.6	36.1	17.6	943.7	653.2	13.2	7.9
Denmark	2,660.5	2,853.6	43.1	75.0	972.0	954.4	19.4	29.4
Estonia	511.1	112.8	7.6	2.3	238.5	23.2	1.4	0.9
Finland	1,328.4	1,853.1	27.2	47.1	220.6	91.6	4.8	4.4
France	21,285.9	2,714.5	351.3	55.4	5,861.5	2,043.3	57.4	68.0
Germany	38,292.3	38,271.2	500.8	924.8	9,806.7	9,401.3	108.6	198.0
Greece	4,476.0	515.8	45.1	5.6	2,746.1	213.5	25.7	1.4
Hungary	1,652.9	758.3	20.5	10.6	723.7	94.5	7.0	1.8
Ireland	1,088.3	24.9	12.2	0.4	2,063.6	170.4	15.7	1.3
Italy	10,719.3	31,734.8	137.4	543.1	9,020.5	17,607.7	91.2	238.5
Latvia	476.6	18.5	6.8	0.3	113.0	21.8	1.3	0.3
Lithuania	1,461.1	740.7	15.6	7.1	529.0	668.9	4.1	15.8
Luxemburg	264.3	10.3	9.4	0.5	161.7	13.3	3.7	0.3
Malta	226.9	0.0	2.6	0.0	150.6	85.5	1.2	0.5
Poland	7,783.0	2,763.5	82.4	39.0	1,989.8	632.0	22.5	7.9
Portugal	2,022.8	13,022.6	26.8	196.4	1,071.4	2,133.5	11.7	22.8
Romania	3,508.4	5.0	18.0	0.1	1,766.3	149.3	15.5	1.1
Slovakia	885.5	128.1	13.8	2.0	1,064.3	56.1	9.1	0.7
Slovenia	1,067.2	2,496.2	11.9	30.7	585.1	1,698.2	5.3	16.8
Spain	6,509.8	5,508.8	114.2	85.7	7,855.6	3,893.7	86.2	39.0
Sweden	2,035.6	2,983.5	28.4	57.9	2,212.2	27.7	15.1	1.1
The Netherlands	5,315.2	629.5	105.1	7.3	2,909.9	241.2	21.7	6.4
United Kingdom	10,513.4	1,766.9	132.4	33.2	18,151.2	2,514.2	209.2	27.7

The following presents an analysis of the EUROSTAT data, the breakdown of the trade data presented in Table 6 (the total value of trade) and the data shown in Appendix 1, which presents the breakdown between EU 27 Intra Europe and Extra Europe trade.

### **Mixing valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures (8481 8011):**

Main findings are as follows:

- Italy was the largest **producer** followed by the UK and Poland. Looking at the value of the production, Italy was again leading but followed by Germany.
- The largest **importers** were Germany, France, Italy and the UK, and it was the same countries that had the largest imports in term of monetary value.
- The largest **exporters** were Germany, Italy, Portugal and Bulgaria. Again the same countries had the largest exports in monetary value.

Further analysis of the trade statistics focusing of intra Europe and extra Europe import and export values (for details see appendix 1) is presented below:

#### **Intra EU27 Trade:**

##### **Intra EU27 Imports**

Intra EU imports in kg represented nearly 60% of all imports within the EU27. Germany was the largest importer of goods from within the EU27 representing 25% of all intra Europe imports, followed by France (21%), Italy (7%), Spain and the Netherlands (both 5%), in kg.

- 42% of Germany's imports were from Portugal and 27% from Italy (kg)
- 39% of France's imports were from Germany and Italy (both 39%) and Spain (8%) (kg)
- 70% of Italy's imports were from Germany (kg)

In terms of value (euro), the intra Europe imports within EU27 represented 73.5% of the total value of all the EU imports. France and Germany intra EU imports both represented 21% of all intra Europe imports (and 18% and 26%, respectively, of all imports), followed by the Italy, the Netherlands and Spain (all approximately 6.5%).

- Germany's imports were mainly from Portugal (43%) and Italy (26%)
- France's imports came mainly from Italy 41% and Germany (40%)

##### **Intra EU27 Exports**

Intra Europe exports represented 70% of all exports in kg. Further analysis of the intra Europe export data indicated that Germany and Italy were the most important exporters representing 27% of the quantity (kg) of all intra EU exports, followed by Portugal with 14%, and Bulgaria with nearly 7%.

- Germany exported to almost all MS and mainly to France (20% of all German exports), 13% to Italy as well as the Netherlands, 9% to Austria, and 7% to both Spain and the UK
- Italy exported mainly to France (29%), Germany (17%), the UK (15%) and to Spain (7%)
- Portugal mainly exported to Germany (70%) and to Spain (24%)

In terms of value (euro), the intra Europe exports represented 68% of the total value of all the EU exports. Germany exports represented 35% of intra EU27 exports (and nearly 40% of all exports), followed by Italy (26%) and Portugal (12% of the intra Europe export value).

- Germany exported mainly to France – 18% of its overall intra Europe export; followed by the Netherlands with 16%
- Italy exported mainly to France (32%), Germany and the UK (both 16%)
- Portugal exported mainly to Germany (72%)

## Extra EU27 Trade:

### Extra EU27 Imports

- The largest imports (in weight) to Europe came from China, representing 80% of all extra Europe imports, but just 33% of all European imports (intra and extra). In value terms import from China represented 68% of the extra Europe imports, but just 18% of all European imports.
- Import from China represented more than 50% of all imports for some MS such as:
  - Romania (70%) of all imports
  - Poland (66%)
  - Lithuania (67%)
  - Bulgaria (61%)
  - the UK (55%)

### Extra EU27 Exports

- Europe main export destination was Russia which represented 22% of all extra Europe exports (expressed in weight), but just 7% of all exports.
- The following Member States exported to Russia:
  - Hungary – 68% of all export to Russia came from Hungary (in kg) and this represented 70% of Hungarian export value (in euro)
  - Lithuania – 62% of its extra EU27 exports were to Russia, which represented 58% of the export value (in euro)
  - Latvia - 58% of its extra EU27 exports in kg were to Russia, representing 58% of the export value (in euro)

## **For taps, cocks and valves for sinks, washbasins, bidets, water cisterns, baths and similar fixtures (excl. mixing valves) (8481 8019)**

- Italy is the largest **producer** followed by Germany and Portugal. However, looking at the value of the production it appears that Germany is the largest producer, followed by Italy.
- The largest **importer** was the UK, followed by (in order) Germany, Italy and Spain. Again the same countries had the largest monetary value.
- The largest **exporters** were topped by Italy, followed (in order) by Germany, Spain and the UK. In terms of monetary value, the exports were topped by Italy, but followed by Germany, France and Spain.

## Intra EU27 Trade

### Intra EU27 Imports

Intra EU imports in kg represented 50% of all imports within the EU27. The UK was the largest importer of goods from within the EU 27 representing 16% of all intra Europe imports, followed by Germany with 13%, Spain (10%) and France (9%).

- 66% of the UK's imports were from Italy, and 16% were from Germany
- 46% of Germany's intra Europe imports came from Italy, 12% from the Netherlands, and 9% from Portugal
- 76% of Spain's intra Europe imports came from Portugal, and 8% from Italy
- 46% of France's intra Europe imports came from Italy

In terms of value (euro), the intra Europe imports within EU27 represented 61% of the total value of all the EU imports. The UK intra EU imports represented 19% of all intra EU imports, followed by Germany (12%), Spain (11%) and Italy (7%),

- UK's imports were mainly from Italy (59%)
- German's imports came mainly from Italy, representing 39% of the overall value of intra Europe imports
- Spain's imports came from Portugal (68%)
- Italian intra Europe imports were mainly from Germany (77%)

## **Intra EU27 Exports**

Intra Europe exports represented 50% of all exports (in kg). Further analysis of the intra Europe export data indicated that Italy was the biggest intra EU27 exporter representing 29% of the quantity (kg) of all intra EU exports, followed by Germany with 27%, the UK and Spain – both with 7%.

The MS that exported the most within the EU 27 were:

- Italy with 37% of its overall exports being to other MS. Italy mainly exported to Germany representing 31% of its intra EU exports followed by France (22%) and Greece (15%). Again Italy also exports to almost every MS.
- Germany, where 64% of all exports were to other MS. Germany mainly exported to Austria (representing 17% of Germany's intra EU exports), followed by the Netherlands (13%). It can be noted that Germany exports to almost all MS.

Looking at the value (in Euro) of intra EU exports, they represented 54% of all exports for the EU27.

- Germany intra EU export represented 35% of the total value of intra EU exports. It mainly exported to the Netherlands (14%), Austria (13%) and Belgium 12%.
- Italy was the second largest intra EU exporter, representing 25% in value (euro) of all intra EU exports. Italy exported mainly to Germany (23%), France (22%) and the UK (15%).

## **Extra EU27 Trade:**

### **Extra EU27 Imports**

- The largest imports to Europe came from China – 88% of all extra Europe imports originated from there; however it constituted just 44% of all European imports (intra and extra). In terms of value (euro), the imports from China represented 75% of all imports value (extra EU27), but just 30% of the overall European imports value.
- Imports from China (in weight) represented more than 50% of all imports for some MS such as:
  - Italy – 80%
  - Malta – 64%
  - the UK – 54%
- The second largest imports to Europe came from Taiwan (representing just 2% of all European imports (both – in weight and value terms).

### **Extra EU27 Exports**

- Europe main export destination were the United States which represented 15% of extra Europe export expressed in weight, but just 7% of the overall exports; in term of value (euro) the US represented 8% of all export.
- Saudi Arabia was the second main export destination with 7% (kg) of all export from Europe, representing just 5% of the value (euro) of all EU exports.

## **2.1.4 Imports and Exports in Product Units**

Similar to the Production Data, trade data is presented in kilograms. In order to calculate import and exports in product units the same assumptions as used for calculating production data in units have been used.

- It is assumed that the weight reported in CN codes is for taps and showerheads only.
- The data can be split in the ratio 25% showerheads and 75% taps in terms of units.
- The average weight of a tap is 2 kg and a showerhead is 0.4 kg.
- The weight of a single unit based on the ratio and weights outlined above is required. This has been calculated as 1.6 kg. This figure is used to calculate the total number of units from the aggregated kilogram figures provided by the Eurostat data. Once the total number of units is known the 25% showerheads and 75% taps ratio is applied to provide a breakdown between the two product types.

Table 7 and

Table 8 show the calculated figures in terms of units for imports and exports of taps and showerheads.



**Table 7: Calculated Imports of Taps and Showerheads (thousands of units)**

	<b>Taps</b>	<b>Showerheads</b>
EU27	101,313.5	33,771.2
Austria	3,077.1	1,025.7
Belgium	4,356.8	1,452.3
Bulgaria	825.2	275.1
Cyprus	330.3	110.1
Czech Republic	1,647.0	549.0
Denmark	1,702.7	567.6
Estonia	351.4	117.1
Finland	726.1	242.0
France	12,725.3	4,241.8
Germany	22,546.4	7,515.5
Greece	3,385.4	1,128.5
Hungary	1,114.0	371.3
Ireland	1,477.5	492.5
Italy	9,253.0	3,084.3
Latvia	276.4	92.1
Lithuania	932.9	311.0
Luxemburg	199.7	66.6
Malta	177.0	59.0
Poland	4,581.0	1,527.0
Portugal	1,450.4	483.5
Romania	2,472.5	824.2
Slovakia	914.0	304.7
Slovenia	774.5	258.2
Spain	6,733.8	2,244.6
Sweden	1,991.2	663.7
The Netherlands	3,855.5	1,285.2
United Kingdom	13,436.5	4,478.8

**Table 8: Calculated Exports of Taps and Showerheads (thousands of units)**

	<b>Taps</b>	<b>Showerheads</b>
EU27	80,467.9	26,822.6
Austria	2,111.3	703.8
Belgium	1,824.8	608.3
Bulgaria	3,857.2	1,285.7
Cyprus	2.6	0.9
Czech Republic	1,587.1	529.0
Denmark	1,785.0	595.0
Estonia	63.8	21.3
Finland	911.6	303.9
France	2,230.2	743.4
Germany	22,346.5	7,448.8
Greece	341.9	114.0
Hungary	399.8	133.3
Ireland	91.5	30.5
Italy	23,129.3	7,709.8
Latvia	18.9	6.3
Lithuania	660.8	220.3
Luxemburg	11.1	3.7
Malta	40.1	13.4
Poland	1,591.6	530.5
Portugal	7,104.4	2,368.1
Romania	72.3	24.1
Slovakia	86.3	28.8
Slovenia	1,966.1	655.4
Spain	4,407.4	1,469.1
Sweden	1,411.5	470.5
The Netherlands	408.1	136.0
United Kingdom	2,006.8	668.9

### 2.1.5 Apparent Consumption

In order to calculate Apparent EU consumption from the EU statistics on production and trade, the following formula is used:

- Sales in EU-27 = Production in EU-27 – export to third countries (from EU-27) + imports from third countries (to EU-27)

Apparent consumption is calculated in terms of product units. Using the calculated unit data for production and trade, the apparent consumption for taps and showerheads is shown in Table 9 below. Italy has the largest apparent consumption of taps representing 21.6% of the EU apparent consumption, followed by Germany (9.7%) and France (8.4%) of the overall apparent consumption.

**Table 9: EU Apparent Consumption (thousands of units)**

	<b>Taps</b>	<b>Showerheads</b>
EU-27	185,424	61,808
Austria	966	322
Belgium	2,532	844
Bulgaria	(-2,925)	(-975)
Cyprus	328	109
Czech Republic	1,713	571
Denmark	487	163
Estonia	288	96
Finland	1,431	477
France	15,525	5,175
Germany	17,943	5,981
Greece	3,044	1,015
Hungary	876	292
Ireland	1,386	462
Italy	40,072	13,358
Latvia	258	86
Lithuania	649	217
Luxembourg	189	63
Malta	137	46
Poland	4,812	1,605
Portugal	1,135	378
Romania	2,665	888
Slovakia	1,308	436
Slovenia	(-1,192)	(-397)
Spain	10,953	3,652
Sweden	1,759	586
The Netherlands	3,447	1,149
The United Kingdom	11,430	3,810

These figures, calculated using the values presented in Tables 5, 7 and 8, should be used with caution as they are based on a number of assumptions outlined above. The estimates suggest that some member states are net exporters; these are shown as negative values.

## 2.2 Market and Stock Data

### 2.2.1 Study Approach to Gathering Market and Stock Data

The study team's approach to the collection of market and stock data focused on desk based research, retail inputs received through first stakeholder questionnaire and detailed follow up enquiries, review of current major market research firms and water technology focussed publications.

Despite best efforts, available data were only limited and therefore for the purposes of task 2 the study team developed a model to calculate sales and stock data for taps and showerheads in the domestic and non-domestic sectors. Inputs to the model consisted of EU official statistics, stakeholder responses to the first questionnaire, and various studies relevant to the European building sector. Using the same models we have estimated data for sales, this has been calculated using the stock data divided by the life span for taps and showerheads. Full details of the life span data used are provided below.

The following sources have been reviewed to gather relevant data to feed into the modelling:

- Eurostat
- Manufacturer association such as UK Bathroom Manufacturers Association
- Market Transformation Programme (UK)
- AMA (market research companies) report
- Ecolabel, blue angel, Nordic swan,
- ANEC (European Association for the Co-ordination of Consumer Representation in Standardisation)
- Water Research Council
- Water label such as those in the UK and Portugal

### 2.2.2 Stock

This section focuses on establishing a baseline for current stocks of products installed within the EU 27. Stock is defined as sales\*lifetime of the product.

Stock refers to the products already placed into the market and installed. Due to data limitations, it has not been possible to use sales data to establish a stock; instead a simple model has been developed to estimate stock values for past and future years. The stock data that has been calculated is presented for taps and showerheads included within the scope of the product definition for this study.

At present due to the lack of disaggregated data by tap and showerhead type, it has not been possible to calculate estimate based on the type of taps such as pillars or mixers, or showerheads type.

#### Modelling assumptions

In order to build a model a number of assumptions had to be made, and are presented below.

##### Stock within domestic dwellings

A number of data and assumptions underpin the estimated stock of taps and showerheads within dwellings. The starting point of the model was the population and the numbers of households across the EU, both data sets have been extracted from Eurostat. Data used is for 2007 which was the most recent complete data set available.

Further information used to develop the model relate to the number of existing buildings which was used to calculate a ratio of houses to apartments. The term houses include - single family house (i.e. detached house, semi detached house and terraced (row) houses and multi-family houses which are apartment either in purpose build blocks of flats or converted house into apartments. This has been

calculated using data from the ENPER-EXIST<sup>5</sup> study on building stock. Using the data reported, averages have been calculated to establish the ratio of houses to apartments. It is calculated that houses represent 60% and apartments 40% of all dwellings for all MS.

Once the number and type of dwellings was established, the next step is to identify how many taps and showerheads are installed within each type of dwelling, to enable the stock to be calculated. This information was gathered through the first stakeholders' questionnaire, which asked for information regarding the number of taps and showerheads per room (kitchen, bathroom, cloakroom, outdoor and other). Based on feedback, the average for the EU27 shown in Table 10 was established and applied to the model.

**Table 10: Average number of taps and showerheads per 100 apartments and houses**

	Apartment	House
<b>Average Number of Taps</b>	450	550
<b>Average Number of Showers</b>	125	125

The stock was established by using the number of households across the EU, applying the rationale of 60% house and 40% apartments. Once the number and type of households was calculated, it was possible to estimate the number of taps and showerheads for each type of housing across the EU, using the average number derived from the questionnaire as presented above.

To establish the forecast for future years, a population growth rate was calculated based on previous trends from Eurostat population data and used to get to an average population growth rate. This rate was then applied linearly to future years. The same was repeated for the number of households. The ratio of houses to apartments was kept at 60%/40% and the average number of taps and showerheads by type of housing was kept the same.

### **Stock of non-domestic premises**

A number of assumptions have been made to establish the non-domestic stock. The starting point for the model is the number of businesses across the EU27 where more than 99% of all businesses are SMEs (Eurostat<sup>6</sup>), the data has been extracted from Eurostat and was broken down into the categories shown in Table 11.

**Table 11: Categories of Businesses**

	Number of employees
Micro	<10
Small	<50
Medium	<250
Large	251>

The data gathered was from 2003 to 2008. Using these figures, a business growth rate was calculated on the past trends, averaged and then used linearly to calculate estimated number of businesses to 2020.

In addition to the number of businesses, Eurostat provided statistical data on the average number of employees per enterprise for each size of businesses (i.e. micro, small, medium and large) within each Member States. The data was available from 2003 to 2008 and has been used to establish a growth rate for the number of employees per enterprise by size of businesses. The growth rates calculated year on year, have been averaged and applied linearly to forecast future years.

This data was then used to apply UK Health and Safety Guidance<sup>7</sup> that outlines the number of toilets facilities that should be provided within any one building based on the number of employees within the

<sup>5</sup> Applying the EPBD to improve the Energy Performance Requirements to Existing Buildings – ENPER-EXIST - WP3: Building stock knowledge, June 2007, K Engelund Thomsen et al

<sup>6</sup> Facts and figures about the EU's SME

<sup>7</sup> HSE – Welfare at Work – Guidance for employers on welfare provisions <http://www.hse.gov.uk/pubns/indg293.pdf>

enterprise. France has a regulation in place, which provides for one toilet facility to a maximum of 10 employees<sup>8</sup>. However, the UK guidance has been used for the model as it provides a more detailed breakdown of requirements split between male and female across different business sizes.

- The stock for bathroom taps was then established by using the number of toilet facilities required based on the average number of employees per enterprise for each size of businesses multiplied by the number of businesses of each size.
- The stock of kitchen taps has been based on 1 tap per 100 employees. The number of taps was thus established using the average number of employees per enterprise for each size of business, and then multiplied by the number of businesses of each size. No regulation or guidance was found relating to the provision of kitchen facilities and linking these to the numbers of employees.
- The stock for showerheads has been based on 1 shower per 100 employees from micro to medium size companies, and that separate showers would be provided for male and female. For large companies the assumption is one shower for every 300 employees and again separate ones for male and female. To calculate the stock we have assumed that just 25% of businesses overall would actually provide showering facilities to employees.
- The sales estimated have been calculated using the stock data and the lifespan of the products. The lifespan shown in Table 12 has been set based on the feedback received via stakeholder consultation. It should be noted that the feedback received was very small (just 6 respondents) and included a wide range of potential lifespan. Stakeholders are invited to provide additional information on the lifespan of taps and showerheads.

For the above data, the average EU split of the workforce between male and female has been applied, which was 55% male and 45% female in 2007, based on Eurostat data<sup>9</sup>. We have applied this workforce split linearly throughout to 2020.

**Table 12: Lifespan of taps and showerheads (years)**

	Taps	Showerhead
Domestic dwelling	16	10
Non-domestic sector	10	7

The three sets of data are then added together with the domestic stock estimated to establish an overall stock for taps and showerheads.

The above assumptions do not take into account taps and shower facilities that will be provided to customers as part of a business such as tourism activities, or hospitals. So as to understand the magnitude of these sectors in terms of number of taps and showerheads, the model includes some data relating to the tourism sector, hospital and the education sector.

- Hospital: Eurostat<sup>10</sup> provides the number of hospital beds across all EU 27. The following assumptions were applied to the number of beds - 1 bathroom with 1 tap and 1 showerhead for every 4 beds – average across all Member States. For kitchen taps, the assumption is 1 tap for every 75 beds.
- Tourism: Eurostat<sup>11</sup> provides the number of tourism beds across the EU-27. That is the number of beds available in all type of tourism accommodations. The assumptions used here are – that 50% of all beds will have one bathroom with one tap and one showerhead, the other 50% will have one bathroom with one tap and one showerhead for 2 beds. The assumption for kitchen taps is based on 1 tap per 100 beds.

<sup>8</sup> Code du Travail Français – Article R232-2-3

<sup>9</sup> [http://epp.eurostat.ec.europa.eu/portal/page/portal/employment\\_unemployment\\_ifs/data/database](http://epp.eurostat.ec.europa.eu/portal/page/portal/employment_unemployment_ifs/data/database)

<sup>10</sup>

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&language=en&pcode=tps00046&plugin=0&tableSelection=1&footnotes=yes&labeling=labels>

<sup>11</sup> <http://epp.eurostat.ec.europa.eu/portal/page/portal/tourism/data/database>

- Education: Eurostat<sup>12</sup> provides the total number of student/pupils (at all levels) enrolled across the EU 27. The following assumptions were applied – on average across the EU there is 1 tap per bathroom, 1 showerhead and 1 kitchen tap for every 100 student/pupils.

The forecast estimates for future years has been established by calculating a growth rate year on year from the data sets extracted from Eurostat for the period 2003-2008 e.g. number of businesses, hospital beds etc. then averaging them and applying that growth rate linearly to future years.

Table 13 and Table 14 below present the estimated stock for non-domestic taps and showerheads and Table 15 and Table 16 show the estimated stock for domestic taps and showerheads, as calculated using the project models. A summary for both non domestic and domestic taps and showerheads is presented below:

#### Taps:

- The stock of taps from the **domestic** sector is by far the largest with more than 1 billion units installed across all Member State. The non-domestic stock represents just 7% of the Domestic one with around 70 million units installed.
- The taps stock within the **non-domestic** sector is forecasted to grow by around 36% between 2007 and 2020
- The tap stock within the **domestic** sector is forecasted to grow by around 13% between 2007 and 2020 to a total of 1.154 billion units installed
- The MS with the largest stock of taps within the **non-domestic** sector in 2007 were:
  - Italy (17%)
  - France (14%)
  - Spain (12%)
  - Germany (11%) and
  - UK (10%)
- The MS with the largest stock of taps within the **domestic** sector in 2007 were:
  - Germany (19%),
  - France (13%),
  - UK (13%),
  - Italy (12%) and
  - Spain (8%).
- Malta is the country with the smallest stock of taps with just 0.15% (non-domestic) and 0.06% (domestic sector) of the European stock.

#### Showerheads:

- The stock of showerhead from the Domestic sector is by far the largest with more than 248.5 million units installed across all Member State in 2007. The Non-Domestic stock represents just 11% of the Domestic almost 28 million units installed.
- The taps stock within the **non-domestic** sector is forecasted to grow by around 33% between 2007 and 2020
- The showerhead stock within the **domestic** sector is forecasted to grow by around 13% between 2007 and 2020 to a total of 282.5 million units installed
- The MS with the largest stock of showerheads within the **non-domestic** sector in 2007 were:
  - France (18%)
  - Italy (16%)
  - Germany (12%)
  - Spain (11%) and
  - UK (11%)
- The MS with the largest stock of showerheads within the **domestic** sector in 2007 were:
  - Germany (19%),

<sup>12</sup> [http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=educ\\_enr11t&lang=en](http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=educ_enr11t&lang=en)

- France (13%),
  - UK (13%),
  - Italy (12%) and
  - Spain (8%).
- Malta is the country with the smallest stock of showerhead with just 0.15% (non-domestic) and 0.06% (domestic sector) of the European stock.

### Non Domestic sector Stock

**Table 13: Stock Taps (units) – Non-Domestic (to nearest thousand)**

Stock of Taps	2005	2006	2007	2012	2015	2020
<b>EU-27</b>	66,580,000	68,177,000	69,810,000	77,951,000	83,513,000	95,041,000
<b>Austria</b>	1,394,000	1,414,000	1,433,000	1,614,000	1,698,000	1,851,000
<b>Belgium</b>	1,242,000	1,251,000	1,267,000	1,366,000	1,406,000	1,479,000
<b>Bulgaria</b>	732,000	774,000	847,000	1,122,000	1,332,000	1,816,000
<b>Cyprus</b>	170,000	170,000	172,000	176,000	177,000	179,000
<b>Czech Republic</b>	2,323,000	2,240,000	2,317,000	2,457,000	2,507,000	2,594,000
<b>Denmark</b>	805,000	820,000	828,000	921,000	965,000	1,048,000
<b>Estonia</b>	126,000	140,000	145,000	200,000	248,000	363,000
<b>Finland</b>	634,000	657,000	678,000	775,000	840,000	964,000
<b>France</b>	9,859,000	10,053,000	10,097,000	10,911,000	11,331,000	12,079,000
<b>Germany</b>	7,233,000	7,498,000	7,582,000	8,315,000	8,643,000	9,222,000
<b>Greece</b>	2,334,000	2,365,000	2,394,000	2,624,000	2,781,000	3,092,000
<b>Hungary</b>	1,521,000	1,488,000	1,467,000	1,428,000	1,391,000	1,332,000
<b>Ireland</b>	392,000	415,000	424,000	520,000	576,000	687,000
<b>Italy</b>	11,546,000	11,715,000	12,006,000	13,045,000	13,637,000	14,689,000
<b>Latvia</b>	181,000	194,000	204,000	250,000	276,000	329,000
<b>Lithuania</b>	298,000	336,000	344,000	437,000	508,000	658,000
<b>Luxembourg</b>	107,000	108,000	109,000	119,000	123,000	129,000
<b>Malta</b>	103,000	103,000	106,000	108,000	110,000	113,000
<b>Netherlands</b>	2,142,000	2,250,000	2,281,000	2,447,000	2,557,000	2,764,000
<b>Poland</b>	3,762,000	3,837,000	3,965,000	4,396,000	4,583,000	4,923,000
<b>Portugal</b>	2,180,000	2,214,000	2,220,000	3,156,000	4,072,000	6,356,000
<b>Romania</b>	1,335,000	1,393,000	1,400,000	1,712,000	1,944,000	2,431,000
<b>Slovakia</b>	287,000	306,000	298,000	388,000	446,000	582,000
<b>Slovenia</b>	260,000	276,000	283,000	330,000	355,000	403,000
<b>Spain</b>	7,986,000	8,252,000	8,431,000	9,571,000	10,337,000	11,754,000
<b>Sweden</b>	1,729,000	1,811,000	1,854,000	2,053,000	2,188,000	2,438,000
<b>United Kingdom</b>	5,900,000	6,098,000	6,656,000	7,509,000	8,483,000	10,767,000



**Table 14: Stock Showerheads (units) Non Domestic (to nearest thousand)**

<b>Stock of showerhead</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2012</b>	<b>2015</b>	<b>2020</b>
<b>EU-27</b>	26,475,000	27,094,000	27,908,000	30,162,000	32,365,000	37,065,000
<b>Austria</b>	799,000	800,000	809,000	855,000	879,000	923,000
<b>Belgium</b>	438,000	434,000	435,000	431,000	427,000	423,000
<b>Bulgaria</b>	236,000	261,000	287,000	400,000	518,000	817,000
<b>Cyprus</b>	86,000	85,000	85,000	81,000	80,000	78,000
<b>Czech Republic</b>	603,000	592,000	606,000	636,000	648,000	669,000
<b>Denmark</b>	370,000	373,000	372,000	377,000	378,000	381,000
<b>Estonia</b>	41,000	46,000	49,000	72,000	97,000	163,000
<b>Finland</b>	237,000	236,000	241,000	251,000	258,000	273,000
<b>France</b>	5,129,000	5,217,000	5,186,000	5,415,000	5,539,000	5,755,000
<b>Germany</b>	3,311,000	3,361,000	3,377,000	3,450,000	3,567,000	3,772,000
<b>Greece</b>	817,000	833,000	843,000	916,000	977,000	1,090,000
<b>Hungary</b>	443,000	434,000	420,000	391,000	376,000	353,000
<b>Ireland</b>	195,000	199,000	201,000	240,000	261,000	299,000
<b>Italy</b>	4,333,000	4,449,000	4,582,000	4,979,000	5,265,000	5,780,000
<b>Latvia</b>	45,000	48,000	49,000	61,000	71,000	91,000
<b>Lithuania</b>	70,000	74,000	76,000	89,000	100,000	124,000
<b>Luxembourg</b>	58,000	58,000	58,000	60,000	61,000	63,000
<b>Malta</b>	41,000	39,000	41,000	41,000	41,000	42,000
<b>Netherlands</b>	1,075,000	1,092,000	1,095,000	1,148,000	1,183,000	1,244,000
<b>Poland</b>	979,000	976,000	993,000	1,045,000	1,064,000	1,098,000
<b>Portugal</b>	581,000	593,000	600,000	739,000	872,000	1,191,000
<b>Romania</b>	405,000	417,000	420,000	467,000	504,000	577,000
<b>Slovakia</b>	157,000	158,000	147,000	173,000	183,000	205,000
<b>Slovenia</b>	79,000	82,000	83,000	92,000	96,000	105,000
<b>Spain</b>	3,044,000	3,136,000	3,166,000	3,492,000	3,754,000	4,234,000
<b>Sweden</b>	689,000	734,000	755,000	809,000	848,000	918,000
<b>United Kingdom</b>	2,216,000	2,366,000	2,932,000	3,453,000	4,318,000	6,397,000

## Domestic sector stock

Table 15: Stock taps (units) Domestic sectors (to nearest thousand)

Stock of Taps	2005	2006	2007	2012	2015	2020
<b>EU-27</b>	990,520,000	997,223,000	1,015,257,000	1,069,367,000	1,101,314,000	1,153,998,000
<b>Austria</b>	16,878,000	17,480,000	17,740,000	18,675,000	19,264,000	20,266,000
<b>Belgium</b>	21,176,000	21,094,000	22,381,000	23,167,000	23,615,000	24,325,000
<b>Bulgaria</b>	14,642,000	14,703,000	14,672,000	14,412,000	14,204,000	13,843,000
<b>Cyprus</b>	1,184,000	1,215,000	1,276,000	1,427,000	1,522,000	1,685,000
<b>Czech Republic</b>	20,564,000	20,890,000	21,048,000	22,596,000	23,600,000	25,292,000
<b>Denmark</b>	11,885,000	11,895,000	12,017,000	12,353,000	12,528,000	12,811,000
<b>Estonia</b>	2,558,000	2,619,000	2,655,000	2,821,000	2,873,000	2,958,000
<b>Finland</b>	12,145,000	12,145,000	12,268,000	12,657,000	12,876,000	13,221,000
<b>France</b>	126,327,000	127,470,000	131,815,000	137,052,000	142,087,000	150,514,000
<b>Germany</b>	196,114,000	197,023,000	196,609,000	203,761,000	206,981,000	212,303,000
<b>Greece</b>	20,007,000	21,018,000	21,186,000	22,618,000	23,666,000	25,401,000
<b>Hungary</b>	19,604,000	19,512,000	19,481,000	19,649,000	19,863,000	20,209,000
<b>Ireland</b>	9,128,000	9,376,000	9,653,000	10,930,000	11,664,000	12,722,000
<b>Italy</b>	113,482,000	113,125,000	118,786,000	127,060,000	131,540,000	138,765,000
<b>Latvia</b>	4,309,000	4,247,000	4,176,000	4,518,000	4,617,000	4,784,000
<b>Lithuania</b>	6,024,000	6,085,000	6,065,000	6,885,000	7,276,000	7,985,000
<b>Luxembourg</b>	904,000	909,000	924,000	1,001,000	1,047,000	1,125,000
<b>Malta</b>	659,000	638,000	638,000	698,000	704,000	713,000
<b>Netherlands</b>	35,557,000	35,731,000	35,777,000	36,804,000	36,800,000	36,742,000
<b>Poland</b>	63,151,000	64,667,000	64,851,000	67,352,000	68,740,000	71,022,000
<b>Portugal</b>	18,751,000	19,088,000	19,323,000	20,340,000	21,055,000	22,219,000
<b>Romania</b>	39,422,000	37,370,000	37,574,000	37,457,000	37,394,000	37,245,000
<b>Slovakia</b>	8,275,000	8,490,000	8,536,000	8,899,000	9,136,000	9,532,000
<b>Slovenia</b>	3,640,000	3,620,000	3,814,000	3,938,000	4,053,000	4,233,000
<b>Spain</b>	73,187,000	75,607,000	78,247,000	90,748,000	98,029,000	109,928,000
<b>Sweden</b>	20,012,000	20,127,000	20,327,000	21,185,000	21,686,000	22,491,000
<b>United Kingdom</b>	130,937,000	131,080,000	133,418,000	140,364,000	144,493,000	151,664,000

**Table 16: Stock Showerheads (units) Domestic sectors (to nearest thousand)**

Stock of Showerhead	2005	2006	2007	2012	2015	2020
<b>EU-27</b>	242,530,000	244,171,000	248,587,000	261,836,000	269,658,000	282,558,000
<b>Austria</b>	4,133,000	4,280,000	4,344,000	4,573,000	4,717,000	4,962,000
<b>Belgium</b>	5,185,000	5,165,000	5,480,000	5,672,000	5,782,000	5,956,000
<b>Bulgaria</b>	3,585,000	3,600,000	3,593,000	3,529,000	3,478,000	3,390,000
<b>Cyprus</b>	290,000	298,000	313,000	349,000	373,000	413,000
<b>Czech Republic</b>	5,035,000	5,115,000	5,154,000	5,533,000	5,779,000	6,193,000
<b>Denmark</b>	2,910,000	2,913,000	2,943,000	3,025,000	3,068,000	3,137,000
<b>Estonia</b>	626,000	641,000	650,000	691,000	704,000	724,000
<b>Finland</b>	2,974,000	2,974,000	3,004,000	3,099,000	3,153,000	3,237,000
<b>France</b>	30,931,000	31,211,000	32,275,000	33,557,000	34,790,000	36,854,000
<b>Germany</b>	48,019,000	48,241,000	48,140,000	49,891,000	50,680,000	51,983,000
<b>Greece</b>	4,899,000	5,146,000	5,188,000	5,538,000	5,795,000	6,219,000
<b>Hungary</b>	4,800,000	4,778,000	4,770,000	4,811,000	4,863,000	4,948,000
<b>Ireland</b>	2,235,000	2,296,000	2,363,000	2,676,000	2,856,000	3,115,000
<b>Italy</b>	27,786,000	27,699,000	29,085,000	31,111,000	32,208,000	33,977,000
<b>Latvia</b>	1,055,000	1,040,000	1,023,000	1,106,000	1,131,000	1,171,000
<b>Lithuania</b>	1,475,000	1,490,000	1,485,000	1,686,000	1,782,000	1,955,000
<b>Luxembourg</b>	221,000	223,000	226,000	245,000	256,000	276,000
<b>Malta</b>	161,000	156,000	156,000	171,000	172,000	175,000
<b>Netherlands</b>	8,706,000	8,749,000	8,760,000	9,011,000	9,011,000	8,996,000
<b>Poland</b>	15,463,000	15,834,000	15,879,000	16,491,000	16,831,000	17,390,000
<b>Portugal</b>	4,591,000	4,674,000	4,731,000	4,980,000	5,155,000	5,440,000
<b>Romania</b>	9,653,000	9,150,000	9,200,000	9,171,000	9,156,000	9,119,000
<b>Slovakia</b>	2,026,000	2,079,000	2,090,000	2,179,000	2,237,000	2,334,000
<b>Slovenia</b>	891,000	886,000	934,000	964,000	992,000	1,036,000
<b>Spain</b>	17,920,000	18,513,000	19,159,000	22,220,000	24,003,000	26,916,000
<b>Sweden</b>	4,900,000	4,928,000	4,977,000	5,187,000	5,310,000	5,507,000
<b>United Kingdom</b>	32,060,000	32,095,000	32,668,000	34,368,000	35,379,000	37,135,000

The modelling has also been used to estimate sales. The calculation is based on the estimated stock as presented in Table 13, Table 14, Table 15 and Table 16, and the assumed life span of taps and showerheads as presented above in Table 12. The results are summarised below, with the estimates presented in Table 17, Table 18,

Table 19 and Table 20.

Sales of taps:

- Non domestic sales for taps are forecasted to grow from almost 7 million units in 2007 to more than 9.5 million in 2020, and increase of more than 35% across the EU overall
- Member states with the highest sales in the **non-domestic** sector in 2007 were:
  - Italy (17%)
  - Spain (12%)
  - France (14%)
  - Germany (11%) and
  - UK (9%)

- Domestic sales of taps are forecasted to grow from 63.5 million units to more than 72 million in 2020 across the EU.
- Member states with the highest sales in the **domestic** sector for taps in 2007 were:
  - Germany (19%)
  - UK (13%)
  - France (13%)
  - Italy (12%) and
  - Spain (8%)

Sales of showerheads:

- **Non-domestic** sales of showerheads are forecasted to grow from just over 4 million units in 2007 to more than 5.3 million units in 2020 across the EU.
- Member States with the highest sales in the **non-domestic** sector in 2007 were:
  - France (19%)
  - Italy (16%)
  - Germany (12%)
  - Spain (11%) and
  - UK (11%)
- Within the **domestic** sector the sales of showerheads was just over 25 million units in 2007, and is forecasted to be almost 28.5 million units in 2020.
- Member States with the highest sales in the **domestic** sector in 2007 were:
  - Germany (19%)
  - UK (13%)
  - France (13%)
  - Italy (12%) and
  - Spain (8%)

**Table 17: Estimated sales of taps (units) Non-Domestic sectors (to nearest thousand)**

Sales of taps	2005	2006	2007	2012	2015	2020
<b>EU-27</b>	6,658,000	6,818,000	6,981,000	7,795,000	8,351,000	9,504,000
<b>Austria</b>	139,000	141,000	143,000	161,000	170,000	185,000
<b>Belgium</b>	124,000	125,000	127,000	137,000	141,000	148,000
<b>Bulgaria</b>	73,000	77,000	85,000	112,000	133,000	182,000
<b>Cyprus</b>	17,000	17,000	17,000	18,000	18,000	18,000
<b>Czech Republic</b>	232,000	224,000	232,000	246,000	251,000	259,000
<b>Denmark</b>	81,000	82,000	83,000	92,000	97,000	105,000
<b>Estonia</b>	13,000	14,000	14,000	20,000	25,000	36,000
<b>Finland</b>	63,000	66,000	68,000	78,000	84,000	96,000
<b>France</b>	986,000	1,005,000	1,010,000	1,091,000	1,133,000	1,208,000
<b>Germany</b>	723,000	750,000	758,000	832,000	864,000	922,000
<b>Greece</b>	233,000	237,000	239,000	262,000	278,000	309,000
<b>Hungary</b>	152,000	149,000	147,000	143,000	139,000	133,000
<b>Ireland</b>	39,000	42,000	42,000	52,000	58,000	69,000
<b>Italy</b>	1,155,000	1,171,000	1,201,000	1,304,000	1,364,000	1,469,000
<b>Latvia</b>	18,000	19,000	20,000	25,000	28,000	33,000
<b>Lithuania</b>	30,000	34,000	34,000	44,000	51,000	66,000
<b>Luxembourg</b>	11,000	11,000	11,000	12,000	12,000	13,000
<b>Malta</b>	10,000	10,000	11,000	11,000	11,000	11,000
<b>Netherlands</b>	214,000	225,000	228,000	245,000	256,000	276,000
<b>Poland</b>	376,000	384,000	397,000	440,000	458,000	492,000
<b>Portugal</b>	218,000	221,000	222,000	316,000	407,000	636,000
<b>Romania</b>	134,000	139,000	140,000	171,000	194,000	243,000
<b>Slovakia</b>	29,000	31,000	30,000	39,000	45,000	58,000
<b>Slovenia</b>	26,000	28,000	28,000	33,000	36,000	40,000
<b>Spain</b>	799,000	825,000	843,000	957,000	1,034,000	1,175,000
<b>Sweden</b>	173,000	181,000	185,000	205,000	219,000	244,000
<b>United Kingdom</b>	590,000	610,000	666,000	751,000	848,000	1,077,000

**Table 18: Estimated sales of showerhead (units) - Non-Domestic sectors (to nearest thousand)**

<b>Sales of Showerhead</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2012</b>	<b>2015</b>	<b>2020</b>
<b>EU-27</b>	3,843,000	3,933,000	4,051,000	4,378,000	4,698,000	5,380,000
<b>Austria</b>	116,000	116,000	117,000	124,000	128,000	134,000
<b>Belgium</b>	64,000	63,000	63,000	63,000	62,000	61,000
<b>Bulgaria</b>	34,000	38,000	42,000	58,000	75,000	119,000
<b>Cyprus</b>	12,000	12,000	12,000	12,000	12,000	11,000
<b>Czech Republic</b>	87,000	86,000	88,000	92,000	94,000	97,000
<b>Denmark</b>	54,000	54,000	54,000	55,000	55,000	55,000
<b>Estonia</b>	6,000	7,000	7,000	10,000	14,000	24,000
<b>Finland</b>	34,000	34,000	35,000	36,000	38,000	40,000
<b>France</b>	744,000	757,000	753,000	786,000	804,000	835,000
<b>Germany</b>	481,000	488,000	490,000	501,000	518,000	548,000
<b>Greece</b>	119,000	121,000	122,000	133,000	142,000	158,000
<b>Hungary</b>	64,000	63,000	61,000	57,000	55,000	51,000
<b>Ireland</b>	28,000	29,000	29,000	35,000	38,000	43,000
<b>Italy</b>	629,000	646,000	665,000	723,000	764,000	839,000
<b>Latvia</b>	7,000	7,000	7,000	9,000	10,000	13,000
<b>Lithuania</b>	10,000	11,000	11,000	13,000	15,000	18,000
<b>Luxembourg</b>	8,000	8,000	8,000	9,000	9,000	9,000
<b>Malta</b>	6,000	6,000	6,000	6,000	6,000	6,000
<b>Netherlands</b>	156,000	159,000	159,000	167,000	172,000	181,000
<b>Poland</b>	142,000	142,000	144,000	152,000	154,000	159,000
<b>Portugal</b>	84,000	86,000	87,000	107,000	127,000	173,000
<b>Romania</b>	59,000	61,000	61,000	68,000	73,000	84,000
<b>Slovakia</b>	23,000	23,000	21,000	25,000	27,000	30,000
<b>Slovenia</b>	11,000	12,000	12,000	13,000	14,000	15,000
<b>Spain</b>	442,000	455,000	460,000	507,000	545,000	615,000
<b>Sweden</b>	100,000	107,000	110,000	117,000	123,000	133,000
<b>United Kingdom</b>	322,000	343,000	426,000	501,000	627,000	929,000

**Table 19 Estimated sales of taps (units) - Domestic sectors (to nearest thousand)**

<b>Sales of taps</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2012</b>	<b>2015</b>	<b>2020</b>
<b>EU-27</b>	61,907,000	62,326,000	63,454,000	66,835,000	68,832,000	72,125,000
<b>Austria</b>	1,055,000	1,092,000	1,109,000	1,167,000	1,204,000	1,267,000
<b>Belgium</b>	1,324,000	1,318,000	1,399,000	1,448,000	1,476,000	1,520,000
<b>Bulgaria</b>	915,000	919,000	917,000	901,000	888,000	865,000
<b>Cyprus</b>	74,000	76,000	80,000	89,000	95,000	105,000
<b>Czech Republic</b>	1,285,000	1,306,000	1,316,000	1,412,000	1,475,000	1,581,000
<b>Denmark</b>	743,000	743,000	751,000	772,000	783,000	801,000
<b>Estonia</b>	160,000	164,000	166,000	176,000	180,000	185,000
<b>Finland</b>	759,000	759,000	767,000	791,000	805,000	826,000
<b>France</b>	7,895,000	7,967,000	8,238,000	8,566,000	8,880,000	9,407,000
<b>Germany</b>	12,257,000	12,314,000	12,288,000	12,735,000	12,936,000	13,269,000
<b>Greece</b>	1,250,000	1,314,000	1,324,000	1,414,000	1,479,000	1,588,000
<b>Hungary</b>	1,225,000	1,219,000	1,218,000	1,228,000	1,241,000	1,263,000
<b>Ireland</b>	571,000	586,000	603,000	683,000	729,000	795,000
<b>Italy</b>	7,093,000	7,070,000	7,424,000	7,941,000	8,221,000	8,673,000
<b>Latvia</b>	269,000	265,000	261,000	282,000	289,000	299,000
<b>Lithuania</b>	377,000	380,000	379,000	430,000	455,000	499,000
<b>Luxembourg</b>	56,000	57,000	58,000	63,000	65,000	70,000
<b>Malta</b>	41,000	40,000	40,000	44,000	44,000	45,000
<b>Netherlands</b>	2,222,000	2,233,000	2,236,000	2,300,000	2,300,000	2,296,000
<b>Poland</b>	3,947,000	4,042,000	4,053,000	4,209,000	4,296,000	4,439,000
<b>Portugal</b>	1,172,000	1,193,000	1,208,000	1,271,000	1,316,000	1,389,000
<b>Romania</b>	2,464,000	2,336,000	2,348,000	2,341,000	2,337,000	2,328,000
<b>Slovakia</b>	517,000	531,000	533,000	556,000	571,000	596,000
<b>Slovenia</b>	227,000	226,000	238,000	246,000	253,000	265,000
<b>Spain</b>	4,574,000	4,725,000	4,890,000	5,672,000	6,127,000	6,870,000
<b>Sweden</b>	1,251,000	1,258,000	1,270,000	1,324,000	1,355,000	1,406,000
<b>United Kingdom</b>	8,184,000	8,192,000	8,339,000	8,773,000	9,031,000	9,479,000

**Table 20 Estimated sales of showerheads (units) - Domestic sectors (to nearest thousand)**

Sales of showerhead	2005	2006	2007	2012	2015	2020
<b>EU-27</b>	24,416,000	24,581,000	25,026,000	26,359,000	27,147,000	28,445,000
<b>Austria</b>	416,000	431,000	437,000	460,000	475,000	500,000
<b>Belgium</b>	522,000	520,000	552,000	571,000	582,000	600,000
<b>Bulgaria</b>	361,000	362,000	362,000	355,000	350,000	341,000
<b>Cyprus</b>	29,000	30,000	31,000	35,000	38,000	42,000
<b>Czech Republic</b>	507,000	515,000	519,000	557,000	582,000	623,000
<b>Denmark</b>	293,000	293,000	296,000	304,000	309,000	316,000
<b>Estonia</b>	63,000	65,000	65,000	70,000	71,000	73,000
<b>Finland</b>	299,000	299,000	302,000	312,000	317,000	326,000
<b>France</b>	3,114,000	3,142,000	3,249,000	3,378,000	3,502,000	3,710,000
<b>Germany</b>	4,834,000	4,857,000	4,846,000	5,023,000	5,102,000	5,233,000
<b>Greece</b>	493,000	518,000	522,000	558,000	583,000	626,000
<b>Hungary</b>	483,000	481,000	480,000	484,000	490,000	498,000
<b>Ireland</b>	225,000	231,000	238,000	269,000	288,000	314,000
<b>Italy</b>	2,797,000	2,788,000	2,928,000	3,132,000	3,242,000	3,420,000
<b>Latvia</b>	106,000	105,000	103,000	111,000	114,000	118,000
<b>Lithuania</b>	148,000	150,000	149,000	170,000	179,000	197,000
<b>Luxembourg</b>	22,000	22,000	23,000	25,000	26,000	28,000
<b>Malta</b>	16,000	16,000	16,000	17,000	17,000	18,000
<b>Netherlands</b>	876,000	881,000	882,000	907,000	907,000	906,000
<b>Poland</b>	1,557,000	1,594,000	1,599,000	1,660,000	1,694,000	1,751,000
<b>Portugal</b>	462,000	471,000	476,000	501,000	519,000	548,000
<b>Romania</b>	972,000	921,000	926,000	923,000	922,000	918,000
<b>Slovakia</b>	204,000	209,000	210,000	219,000	225,000	235,000
<b>Slovenia</b>	90,000	89,000	94,000	97,000	100,000	104,000
<b>Spain</b>	1,804,000	1,864,000	1,929,000	2,237,000	2,416,000	2,710,000
<b>Sweden</b>	493,000	496,000	501,000	522,000	535,000	554,000
<b>United Kingdom</b>	3,228,000	3,231,000	3,289,000	3,460,000	3,562,000	3,738,000

### Insights from the modelling

As outlined in earlier sections, the modelled data is based on a number of assumptions that need to be checked with stakeholders. Notwithstanding the assumptions, the model outputs suggest the following:

- Showerheads are mainly found within domestic dwellings rather than non-domestic premises; For every 10 showerheads only one is in a non domestic premises
- A similar trend is identified for taps, approximately for every 15 taps only one is in a non domestic building
- The sector breakdown in terms of stock arising from domestic dwellings and from the non-domestic sector, the non-domestic sector represents just 7% of the stock of taps and 11% of the showerhead stock.

## 2.3 Market and Production Structures

To date we have identified little information regarding the situation across the EU via our own research or from commentary provided by stakeholders. Consequently we have used what little information that is available from a market research report (AMA 2006) and work published in the UK.

Sources that have been searched and reviewed:

- Water technology list
- MTP (UK Market Transformation Programme)
- Manufacturers' websites
- Internet search

### 2.3.1 General trends

MTP estimated that 67% of all households in the UK are equipped with a shower (or 13.5 million households). Of these, 80% have it installed over the bath. This means that 54% of all household in the UK have a shower over the bath and 13% have a separate shower cubicle.

People living in the UK are using on average 150 litres of water per day for washing, cooking and drinking. Improvements in lifestyle and new technologies within the domestic environment mean we use 55% more water than we did 25 years ago, with half of this being used within the bathroom environment (Water Efficient Product Labelling Scheme UK). MTP<sup>13</sup> data suggests that:

- Growth in the shower market continues to drive the increase in the base of showers established. The growth is expected to be 2.5% from 2007 to 2012, then 1% per annum thereafter. The ratio of mixer showers to electric showers is expected to remain constant over the next 25 years (no data from the MTP document identifying the ratio). The stakeholders' consultation has identified that the ratio of mixer to electric showers is typically around 50/50. However it should be noted that this is only relevant to the UK and Ireland electric showers' markets.
- The type of mixer showers is expected to shift towards the power and pressurised type by 2.5-3% per annum from 2007 to 2012 and 1% per annum thereafter. Stakeholders further commented on this trend, adding that "while approximately 50% of the shower sales in the UK may be mixer showers, 60% of mixer showers are actually installed onto low pressure systems. Therefore with 50% market share being electric showers and approximately 30% market share being low pressure mixers there are only 20% of the market using high pressure or power systems. Manufacturers in the UK make 'power showers' which are a complete unit with an integrated pump. Sales of these products are in decline. Installations of mixer showers installed to combination boilers are often detailed as high pressure or power or pressurised showers. However, the reality of the situation in the UK is that often the cold water supply to the combination boiler is at the low level of acceptability (i.e. around 1 bar) and as such mixer showers fitted to combination boilers often operate at no more than 8 litres per minute. This sort of performance is much more aligned to the expected maximum performance of a mixer shower installed to a low pressure water system."

It is also worth noting that sales of shower heads are vastly different to that of shower controls. In the UK most shower controls are sold as complete kits with a shower head. However, one of the most commonly replaced items in the UK bathroom is that of the shower head. Customers often fit a non OEM shower head to change the look of the bathroom. Manufacturers in the UK also use a number of methods to limit flow through showers. This can range from shower heads with flow regulators already in them to shower controls with the flow regulators already in them. The market and the control of flow through products in the market are therefore very fragmented. To limit sales of showerheads by flow rate only would affect the ability of some manufacturers to design products to satisfy the wide ranging conditions found in the UK.

The stakeholders' consultation resulted in identifying that the current economic climate has resulted in a loss of around 25% in market value/volume across the majority of bathroom products. Overall

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<sup>13</sup> BN DW Shower: Shower design and efficiency – Briefing Note relating to policy scenario objectives in Policy Brief



bathroom manufacturers are not particularly optimistic that this loss in the market will be recovered quickly.

Market research report from AMA established that import of sanitary ware represented 60% of UK market for the period 2005 and 2006. The main imports originated from China, Thailand, Turkey and the Middle East.

These countries export mainly products on the cheaper end of the spectrum. These imports have replaced products that were historically imported to the UK from within the EU.

Growth of lower value imports has increased the level of price competition across all sectors of the market, with sanitary ware products from higher value EC sources such as Italy and France also experiencing a decline in average prices over the past three years in the UK.

An increase in the level of imports in the UK has also been driven by retailers sourcing own brand products directly from lower value sources. Price competition, particularly in the DIY sector, has been a major factor affecting value growth across baths and sanitary ware.

### **2.3.2 Showers**

Data presented here is extracted from a market research report focused on the UK.

Lifestyle changes are changing the typical 'everyday' use of the bathroom. Factors prompting these changes in the UK include:

- The growth of additional bathroom installations, e.g. en suites, has supported expenditure in the shower sector at the expense of baths.
- The general shift to showering from bathing, which is viewed as a quicker alternative, prompted by busier lifestyles.
- The higher level of shower installations in new build, compared to baths.
- Product development in the shower sector is focusing on larger shower enclosures designed to replace the bath.
- The growth of smaller households, in particular the higher proportion of single person households is prompting a change in use the bathroom, e.g. wet rooms, larger shower enclosures etc, as the focus on a 'family' bathroom declines.

In general, the high level of refurbishment and additional bathroom installations in recent years has resulted in several key trends emerging in the UK. These include:

- The focus on the main bathroom in larger houses, particularly those with multiple bathroom installations, is changing to an area of well-being and relaxation. This is supporting the freestanding bath sector, along with hydrotherapy products.
- The replacement of the bath with a large shower enclosure or wet room in small properties.
- The shift towards compact baths or multi-purpose products such as showerbaths, which provide a suitable showering and bathing experience in households where additional bathroom installations are restricted.

In recent years showerheads have seen a renewed focus, with now a wide range of choice for domestic and non-domestic premises. Current fashionable trends are towards Spa like showers within the home, such as "rainshower" type showerheads within the UK.

Low end market



### High end market



### Non-domestic type shower



More recent development includes recycling showers, of which there are two types as described by the UK MTP<sup>14</sup>:

- The first type merely filters, reheats and recirculates the shower water without a treatment process to remove shampoos and soaps. This type is designed to reduce the volume of water which is frequently used for relaxation purposes after cleansing has occurred. During the cleansing process the water goes to waste in the same way as for a normal shower. After this stage the water is recycled. A quick cleansing process is recommended to reduce the time during which the water is not recycled. The Quench shower system is an example of this type of recycling shower.
- The second type treats the recycled shower water to remove soaps and impurities before it is pumped back to, and recirculated through, the showerhead. The recycling process with this type can be used for cleansing as well as relaxation purposes. Typically, this type of shower draws some water from the distribution system to mix with the recycled water in the treatment process. In these showers the water is either reheated or mixed with hot water from the plumbing system to achieve the desired temperature. The El Niño system is an example of this type of recycling shower.

MTP estimated that with just a 2% share of sales by 2020, recycling showers offer potential water savings of approximately 1.8 Megalitres/day, or 650 Megalitres/year in the UK.

### 2.3.3 Taps

Data presented here is extracted from a market research report focused on the UK<sup>15</sup>.

<sup>14</sup> BNWAT25: Recycling showers - Innovation Briefing Note, the UK MTP, March 2008

The main product trends in the sanitary ware sector over the past two years in the UK have focused on:

- The small average size of UK bathrooms which has led manufacturers to create comprehensive space-saving ranges. The higher number of en suites and cloakrooms is also driving this trend.
- Consumers are continuing to focus on design, and various shapes, sizes and colours have evolved to meet demand. The range of shapes available across all sanitary ware products has increased dramatically in recent years.
- The shift away from traditional washbasins combined with a pedestal is continuing with surface mounted and wall hung sanitary ware gaining share.
- Winged/counter top basins are increasing in popularity.
- Mixer brassware gains market share, at the expense of pillar taps. This growth is largely due to design trends and the aesthetic benefits of mixers. Functionality benefits include the use of ceramic disc technology (a quarter turn, smooth control can be achieved), and consumer awareness of this has increased. This could have a long-term impact, as maintenance of ceramic disc technology is easier than the traditional spindle tap design.
- The growth of mains pressure hot water systems and the demand for contemporary continental-style brassware have resulted in a large proportion of European manufacturers exporting to the UK. This has led to growth of high-pressure mixer products.
- Basin monobloc, single-hole mixers remain popular in a range of market sectors. Two-hole mixers continue to retain the largest share in terms of basin brassware.

Taps in domestic and non domestic setting are usually very similar in design with many identifiably domestic products appearing in non-domestic buildings. The key differences within non-domestic setting is in the range of operations a tap can do such as integrated spray unit (though these are available on the market for domestic premises) and sensor activated taps. The UK MTP<sup>16</sup> classified taps as follow:

- **Pillar taps**, suitable for mounting on a horizontal surface, have a vertical inlet and a nozzle bent to discharge in a downwards direction. Pillar taps are used on basins, sinks and bidets with two-hole installation. They are generally sold in a matching pair, designed to control hot and cold water flow through separate units. Pillar taps are usually operated by one of two mechanisms, spindle or ceramic disc.
- **Monobloc mixers** are a form of combination tap assembly, whereby a hot water tap and a cold water tap are coupled together with a common outlet nozzle which be either fixed or swivelling, so as to discharge hot, cold or mixed hot and cold water. Monobloc taps are designed to be installed in a single-hole basin or bidet.
- **Two-hole mixers** are a form of combination tap assembly, whereby a hot water tap and a cold water tap are coupled together with a common outlet nozzle which may be either fixed or swivelling, so as to discharge hot, cold or mixed hot and cold water. A two-hole mixer tap requires two separate tap holes for the supply inlets. Mixed water is supplied through a central swivel spout.

Three-hole mixers are appearing on the market, which are essentially the same as the two-hole mixer, except that the two water controls (hot and cold) and the nozzle are separate.

In addition to the taps themselves, the UK MTP<sup>13</sup> identified a range of water efficient tap technology available, including the following:

- **Aerators:** Taps with aerators fitted entrain air in the flow, providing an effective cleansing function with less water.

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<sup>15</sup> Bathroom Market UK 2006, AMA Research Ltd, November 2006

<sup>16</sup> BNWAT26: Household tapware - an overview, the UK MTP, March 2008

- **Sprays** These deliver a spray pattern rather than a solid stream, acting like a mini showerhead at the outlet. BS 411816 and BS 538817 define a spray tap as ‘a tap supplied with water at a predetermined temperature which it delivers, at a restricted rate of flow, in the form of a spray’.
- **Water-saving/water brake features** are used for single-lever mixer taps. As the lever is lifted, resistance is felt once a flow of between 5 and 10 litres per minute is reached. If a higher flow is required, the lever can be pushed past this stop.
- **Water-saving inserts (flow restrictors)** - Small inserts can be fitted to a round tap outlet or standard metric thread of a tap outlet to restrict the flow from the tap. Some devices enable the tap to deliver a spray pattern at low flows, suitable for uses such as washing hands. As the flow increases, the device opens up to allow a full, unrestricted flow for uses such as vessel filling. Other inserts permanently restrict the solid stream of flow but do not deliver a spray pattern.
- **Sensor and push taps** that terminate flow after a fixed duration are often used in non domestic premises

### 2.3.4 Average economic Product Life-Cycle

Based on data available from programmes such as the MTP in the UK and data that was received through the questionnaire, it has been possible to establish the life cycle of the product group. It should be noted at this stage, that this is an average and that different manufacturer will have very different time scale from concept to market for a new product. This time scale is variable depending if it is a “facelift of an existing product” or the conceptualisation, design and production of a radically new product.

The information received indicates that the average time span is between 3 months to around 14 months. But as stated above a more complex project can take up to 4 or 5 years before a product is actually launched onto the market.

There was no indication in the information identified regarding return on investments.

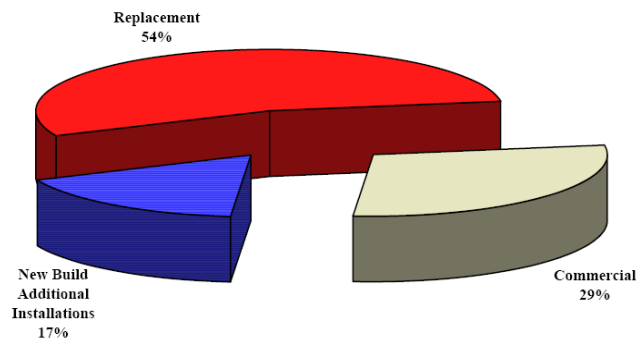
### 2.3.5 Market structure

To date we have identified little information regarding the market structure across Europe. The main information presented here has been extracted from a market research report from AMA (2006).

In terms of market supply the data gathered from Prodcum and Eurostat, indicates that the main EU producers are Italy and Germany, accounting for almost 45% of total production output in the EU. Although as highlighted above, the Prodcum and CN codes include other products in addition to taps and showerheads.

In the UK the replacement and refurbishment sector accounts for the largest share of the bath and sanitary ware market at approximately 54% in 2005. New build and commercial markets make up the remainder of the market share as shown in Figure 2.

**Figure 2: UK Bath and Sanitary ware market share by sector 2005 (by value)<sup>17</sup>**



Source: AMA/Trade Estimates

UK bath & Sanitary ware Market Shares for 2005 was split as shown in Table 21.

**Table 21 UK Bath and Sanitary ware Market Share for 2005 by Company**

Company	Overall (%)
American Standard (Armitage, Shanks, Armitage Venesta, Ideal Standard, Jado, Sottini, Trevi Showers)	25
Jacuzzi	14
Twyford Bathrooms	13
Qualceram Group	5
Others	43

Source: Bathroom Market UK 2006, AMA Research Ltd

<sup>17</sup> Bathroom Market UK 2006, AMA Research Ltd

The key suppliers in the UK are identified as

- Keramag,
- Villeroy & Boch,
- VitrAbad GmbH,
- Duravit Ag,
- Kohler and Ideal Standard.
- Grohe,
- Hansgrohe,
- Kludi,
- Ideal Standard and
- Hansa
- Bristan Group
- Ideal Standard (UK)
- Jacuzzi UK Group
- Qualceram Shires
- Roca
- Samuel Heath & Sons
- Triton
- Twyford Bathrooms

The key importers for the UK market are (AMA data):

- VitraA and Tipravit from Turkey
- Dahll from China
- Lecico from Egypt
- Roca and Porcelanosa form Spain

Feedback from the stakeholders identified that the German market is heavily dominantly by a handful of company, namely Hansa – Hans Grohe and Grohe.

In the UK the distribution channels for these types of products is indicated in Table 22. This indicates a slight shift towards increased DIY sources, and a decline in distribution from builders merchants, which may suggest an increasing number of individuals are undertaking replace and refurbishment work themselves.

**Table 22 UK distribution channels for bath and sanitary ware**

<b>Sector</b>	<b>2002 (%)</b>	<b>2005 (%)</b>
<b>Builders' merchants</b>	60	45
<b>DIY</b>	25	31
<b>Bathroom Specialist</b>	12	20
<b>Others (e.g. Direct)</b>	3	4

Source: Bathroom Market UK 2006, AMA Research Ltd

## 2.4 User Expenditure Base Data

The following section presents relevant product data on retail prices, installation, repair and maintenance costs and disposal costs. It also includes general information on electricity and gas prices, water prices and inflation and interest rates.

Where indicated we invite stakeholder to provide feedback, particularly regarding retail prices, installation, repair and maintenance costs and the cost of spare parts. The remaining data is from official statistics (electricity/gas prices and inflation/interest rates) or consistent with previous EuP studies (water prices).

The data presented in this section is for information only at this stage. This data will be used in later tasks as part of the modelling that will be undertaken to develop a base case scenario and so as to establish potential savings than can be realised. The data has been identified and presented at this stage to ensure consistent information is used in the later tasks. The running costs for a particular product may be influenced by these utility prices, for example where there is an energy related element, or the use of water.

### 2.4.1 Retail Prices

Indicative UK and French retail prices have been researched from consumer catalogues and websites. This has provided an indication of the range of prices for taps and showerheads from which an average can be calculated. Prices in UK sterling have been converted into Euros<sup>18</sup>. The results of this research are presented in Table 23, Table 24 and Table 25 below.

**Table 23 Typical prices for bathroom taps**

Type of Tap	Range (Min – Max) Euros	Average (Median)_Euros
3 hole mixer	125 – 379	252
Monobloc mixer	8.00 – 475	241
Pillar Taps (pair)	18.27 – 158.30	88

**Table 24 Typical prices for kitchen taps**

Type of Tap	Range (Min – Max) Euros	Average (Median) Euros
2 hole mixer	42.62 – 157.08	100
Monobloc mixer	7.90 – 355	181
Pillar Taps (Pair)	18.27 – 59.67	38.97

**Table 25 Typical prices for showerheads**

Range (Min – Max) Euros	Average (Median) Euros
1.50 – 82.80	42.15

The prices outlined above focus on the domestic sector. Further research has identified price information specific types of non-domestic taps and showerheads. This is summarised in Table 26.

<sup>18</sup> Exchange Rate 1 British Pound = 1.2177 Euros – 20<sup>th</sup> August 2010

**Table 26 Typical prices for non-domestic products**

Type of Tap/ Showerhead	Range (Min – Max) Euros <sup>19</sup>	Average (Median) Euros
Infra Red Mixer Tap	269.48 – 480.75	375.12
Lever Taps (Pair)	43.84 – 74.28	59.06
Single Lever Mixer Tap	89.20 – 624.68	356.94
Self closing single taps	27.73 – 316.60	172.17
Showerheads (Wall mounted/swivel design)	33.49 – 132.33	82.91

## 2.4.2 Installation, Repair and Maintenance Costs

The section identifies the cost of installation, repair and maintenance for taps and showerheads. It has been very difficult to identify any reliable sources of information for this section. We have successfully gathered some information from stakeholders through the 1<sup>st</sup> questionnaire. Table 27 presents the average for each tap and showerhead as calculated using stakeholders' feedback and covers information provided from stakeholders across a number of different countries.

**Table 27: Installation – maintenance and repair cost**

	Installation cost (euro)	Maintenance (euro)	Repair (euro)
<b>Domestic</b>			
Bathroom taps	30 - 100	0 to 50	20-100
Showerheads	20 - 60	0 to 15	20 -100
Kitchen taps	30 - 100	0 to 50	0 to 50
Outdoor taps	100		0 to 50
Other taps			
<b>Non-domestic</b>			
Bathroom taps			
Showerheads	60		
Kitchen taps	150	75	75
Outdoor taps			
Other taps			

Installation, repair and maintenance costs will be affected by who undertakes the work, some users will undertake it themselves (DIY), others will engage a professional plumber to carry out the work. Maintenance and repair costs will also vary depending on the part that needs to be replaced, which will also be determined by the type of tap or shower head installed in the first instance.

Typical spare parts and indicative costs are indicated in Table 28, based on information from UK suppliers. However it should be recognised that these are only indicative and costs may vary between suppliers and depending on whether a universal part can be fitted or a specific part for a model of tap is required.

<sup>19</sup> Where prices were in Pounds Sterling, the following exchange rate has been used: 1 British Pound = 1.2177 Euros – 20<sup>th</sup> August 2010



**Table 28 Indicative cost of spare parts**

Spare Part	Price (£)	Euro (conversion) <sup>20</sup>
Washers	Box of mixed washers for taps (approx 80) £6.83	8.32
O Rings	Box of mixed o rings for taps (approx 115) £6.83	8.32
Valves: <ul style="list-style-type: none"> <li>• Ceramic disc valve</li> <li>• Compression tap valve</li> </ul>	20-30 (pair) 4 (single)	24.35 – 36.53 (pair) 4.87 (single)
Ceramic Disc Cartridges (single lever taps)	15 (single)	18.27 (single)
Tap heads	8.50 - 30	10.35 – 36.53
Aerators	5-6	6.09 – 7.31

### 2.4.3 Disposal Tariffs

No information has been found specifically in relation to the disposal costs for taps and showerheads. It is anticipated that end of life disposal costs for these products will vary depending on the procedures undertaken in different countries.

Depending on the nature of the installation, the taps and showerheads may be disposed of alongside other waste, for example other bathroom fittings or construction waste. Further information regarding end of life behaviour for these products is provided in Section 3.3.7 below.

### 2.4.4 Gas and Electricity Prices

The following tables present the prices for electricity and gas for householders and industrial consumer published by Eurostat. The prices are exclusive of any tax and are based on the first semester of each year. More information on data used to compile this information can be found on the Eurostat website<sup>21</sup>

<sup>20</sup> Exchange Rate 1 British Pound = 1.2177 Euros – 20<sup>th</sup> August 2010

<sup>21</sup> "This indicator presents the natural gas prices charged to final consumers. Natural gas prices for industrial consumers are defined as follows: Average national price in Euro per Giga Joule (GJ) for gas and kWh for electricity without taxes applicable for the first semester of each year for medium size industrial consumers, and medium size households." <http://epp.eurostat.ec.europa.eu/tgm/web/table/description.jsp>  
[http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/main\\_tables](http://epp.eurostat.ec.europa.eu/portal/page/portal/energy/data/main_tables)

Table 29: Gas prices for household consumers (Euro/Gigajoule)

geotime	2005	2006	2007	2008	2009	2010
EU 27	8.46	10.00	11.68	11.81	12.67	11.12
Austria	8.91	10.72	10.98	11.88	13.13	12.54
Belgium	8.85	10.75	10.33	13.01	13.54	11.75
Bulgaria	5.61	6.42	7.36	8.20	10.95	8.51
Cyprus	:	:	:	:	:	:
Czech Republic	6.30	8.43	7.94	10.25	11.55	10.87
Denmark	12.58	13.19	13.64	:	12.40	14.60
Estonia	3.92	3.93	4.99	7.39	8.99	7.71
Finland	:	:	:	:	:	:
France	9.00	10.81	11.42	12.29	13.01	12.25
Germany	10.16	12.25	13.97	13.32	13.48	11.54
Greece	:	:	:	:	:	:
Hungary	4.43	4.59	5.97	9.36	11.15	:
Ireland	8.80	11.02	14.74	13.29	15.76	12.07
Italy	8.98	10.43	11.79	12.03	14.16	10.45
Latvia	3.85	4.54	6.35	8.27	13.21	7.92
Lithuania	4.58	5.29	5.97	7.75	10.00	8.62
Luxembourg	7.68	9.74	10.87	14.10	12.19	10.60
Malta	:	:	:	:	:	:
Netherlands	9.64	11.09	12.30	12.01	14.43	11.19
Poland	6.19	7.76	8.76	9.48	8.85	9.68
Portugal	11.75	13.83	13.22	16.54	15.68	15.71
Romania	4.03	6.44	7.60	5.95	5.28	4.18
Slovakia	6.84	9.12	9.64	9.60	10.78	10.18
Slovenia	7.82	10.03	10.75	12.14	14.44	12.56
Spain	10.25	11.75	12.27	13.78	14.64	12.79
Sweden	11.72	14.80	15.09	14.77	14.00	16.45
United Kingdom	6.91	7.84	11.20	10.46	11.28	10.73

Source: Eurostat

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=ten00113&plugin=1>

Table 30: Gas Prices for industrial consumers (Euro/Gigajoule)

geotime	2005	2006	2007	2008	2009	2010
EU 27	6.01	8.11	8.87	8.84	9.32	7.76
Austria	6.14	8.34	8.91	:	:	:
Belgium	5.27	7.06	6.89	8.98	8.73	7.64
Bulgaria	3.78	4.50	5.22	5.72	8.74	6.66
Cyprus	:	:	:	:	:	:
Czech Republic	5.11	7.34	6.56	8.54	8.98	8.23
Denmark	6.01	6.17	5.77	:	7.38	6.65
Estonia	2.75	2.84	3.69	6.78	7.30	7.50
Finland	6.43	7.32	7.61	7.40	8.00	7.90
France	6.22	8.06	7.63	9.06	9.76	8.95
Germany	7.76	10.47	12.15	11.28	10.86	8.98
Greece	:	:	:	:	:	:
Hungary	5.81	7.95	9.48	9.39	10.04	:
Ireland	:	:	:	11.05	9.30	7.67
Italy	6.09	7.04	8.46	8.77	10.40	7.78
Latvia	3.48	4.05	5.29	7.90	10.86	7.16
Lithuania	3.61	4.45	6.02	8.79	8.73	8.91

Luxembourg	6.95	9.01	9.85	10.44	11.08	10.13
Malta	:	:	:	:	:	:
Netherlands	6.39	8.14	8.40	8.12	9.02	7.31
Poland	5.30	6.77	7.54	8.36	7.73	8.40
Portugal	6.03	7.63	7.76	8.69	9.81	7.62
Romania	3.68	6.23	7.32	6.23	5.10	4.12
Slovakia	5.08	7.66	8.00	8.92	11.12	8.72
Slovenia	5.10	7.17	7.33	9.33	11.34	10.88
Spain	4.68	7.24	7.07	7.64	8.70	7.70
Sweden	8.08	11.15	11.06	12.49	9.30	10.32
United Kingdom	5.81	8.92	10.55	7.29	7.99	5.63

Source Eurostat:

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=ten00112&plugin=1>

**Table 31: Electricity prices for Household consumers (Euro/kWh)**

geoltime	2005	2006	2007	2008	2009	2010
EU 27	0.10	0.11	0.12	0.12	0.12	0.12
Austria	0.10	0.09	0.11	0.13	0.14	0.14
Belgium	0.11	0.11	0.12	0.15	0.14	0.14
Bulgaria	0.05	0.06	0.05	0.06	0.07	0.07
Cyprus	0.09	0.12	0.12	0.15	0.13	0.16
Czech Republic	0.07	0.08	0.09	0.11	0.11	0.11
Denmark	0.09	0.10	0.12	0.12	0.12	0.12
Estonia	0.06	0.06	0.06	0.06	0.07	0.07
Finland	0.08	0.08	0.09	0.09	0.10	0.10
France	0.09	0.09	0.09	0.09	0.09	0.09
Germany	0.13	0.14	0.14	0.13	0.14	0.14
Greece	0.06	0.06	0.07	0.10	0.11	0.10
Hungary	0.09	0.09	0.10	0.13	0.12	:
Ireland	0.12	0.13	0.15	0.16	0.18	0.16
Italy	0.14	0.15	0.17	:	:	:
Latvia	0.07	0.07	0.06	0.08	0.10	0.10
Lithuania	0.06	0.06	0.07	0.07	0.08	0.10
Luxembourg	0.13	0.14	0.15	0.14	0.16	0.14
Malta	0.07	0.09	0.09	0.09	0.16	0.16
Netherlands	0.11	0.12	0.14	0.13	0.14	0.13
Poland	0.08	0.09	0.09	0.10	0.09	0.10
Portugal	0.13	0.13	0.14	0.11	0.13	0.11
Romania	0.07	0.08	0.09	0.09	0.08	0.09
Slovakia	0.11	0.12	0.13	0.11	0.13	0.13
Slovenia	0.09	0.09	0.09	0.09	0.11	0.11
Spain	0.09	0.09	0.10	0.11	0.13	0.14
Sweden	0.08	0.09	0.11	0.11	0.10	0.12
United Kingdom	0.08	0.10	0.13	0.14	0.14	0.13

Source Eurostat:

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=ten00115&plugin=1>

**Table 32: Electricity prices for industrial consumers (Euro/kWh)**

geotime	2005	2006	2007	2008	2009	2010
<b>EU 27</b>	0.07	0.08	0.08	0.09	0.10	0.09
<b>Austria</b>	0.06	0.07	0.08	0.09	:	:
<b>Belgium</b>	0.07	0.08	0.09	0.10	0.10	0.09
<b>Bulgaria</b>	0.04	0.05	0.05	0.06	0.06	0.06
<b>Cyprus</b>	0.08	0.11	0.10	0.14	0.12	0.15
<b>Czech Republic</b>	0.06	0.07	0.08	0.11	0.11	0.10
<b>Denmark</b>	0.06	0.07	0.06	0.08	0.07	0.08
<b>Estonia</b>	0.05	0.05	0.05	0.05	0.06	0.06
<b>Finland</b>	0.05	0.05	0.05	0.06	0.07	0.07
<b>France</b>	0.05	0.05	0.05	0.06	0.07	0.07
<b>Germany</b>	0.08	0.09	0.09	0.09	0.10	0.09
<b>Greece</b>	0.06	0.07	0.07	0.09	0.09	0.09
<b>Hungary</b>	0.07	0.08	0.08	0.11	0.12	:
<b>Ireland</b>	0.09	0.10	0.11	0.13	0.12	0.11
<b>Italy</b>	0.08	0.09	0.10	:	:	:
<b>Latvia</b>	0.04	0.04	0.04	0.07	0.09	0.09
<b>Lithuania</b>	0.05	0.05	0.05	0.08	0.09	0.10
<b>Luxembourg</b>	0.08	0.08	0.10	0.09	0.11	0.10
<b>Malta</b>	0.07	0.07	0.09	0.12	0.15	0.18
<b>Netherlands</b>	0.08	0.09	0.09	0.09	0.09	0.09
<b>Poland</b>	0.05	0.05	0.05	0.08	0.09	0.09
<b>Portugal</b>	0.07	0.08	0.09	0.08	0.09	0.09
<b>Romania</b>	0.08	0.08	0.08	0.09	0.08	0.09
<b>Slovakia</b>	0.07	0.08	0.09	0.12	0.14	0.12
<b>Slovenia</b>	0.06	0.07	0.08	0.09	0.11	0.09
<b>Spain</b>	0.07	0.07	0.08	0.09	0.11	0.11
<b>Sweden</b>	0.05	0.06	0.06	0.07	0.07	0.08
<b>United Kingdom</b>	0.06	0.08	0.10	0.09	0.11	0.09

Source Eurostat:

<http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=ten00114&plugin=1>

### 2.4.5 Water Prices

Information relating to water and sewerage prices is limited. Previous EuP work, for example for washing machines has considered data from the 1998 report 'Comparison of Water Prices in Europe, Summary Report' which was produced by the Center for International and European Environmental Research in Berlin, Germany. The data presented in this report is variable across different member states and dates from the early to mid 1990s.

The EuP Task 2 report for Washing Machines<sup>22</sup> also presented data from a 2006 OECD report 'Infrastructure to 2030: Telecom, Land Transport, Water and Electricity. This indicated that the cost of water supply and wastewater infrastructure in Europe for the year 2000 was as follows:

- Water Supply and Combined Sewer – 2.54 Euro/m<sup>3</sup>
- Water Supply and Separate sanitary sewer – 2.29 Euro/m<sup>3</sup>

Additional analysis in the Task 2 Washing Machines report estimated that the European average price for water supply and sewage is 2.5 Euro/m<sup>3</sup>.

<sup>22</sup> [http://www.ecowet-domestic.org/index.php?option=com\\_docman&task=cat\\_view&gid=17&Itemid=48](http://www.ecowet-domestic.org/index.php?option=com_docman&task=cat_view&gid=17&Itemid=48)

Recent information published by the OECD<sup>23</sup>, based on a 2007-2008 survey indicates the price for water and sanitation services varies across European countries. The available information from the OECD is presented in Table 33.

**Table 33 Unit price of water and sanitation services to households including taxes**

Country	Unit price of water and sanitation services to households incl. taxes (USD/m <sup>3</sup> )	Unit price of water and sanitation services to households incl. taxes converted into Euros <sup>24</sup>
Portugal	1.23	0.962
Greece	1.40	1.095
Italy	1.45	1.134
Spain	1.92	1.502
Hungary	2.02	1.580
Poland	2.12	1.658
Czech Republic	2.43	1.901
Sweden	3.59	2.808
France	3.74	2.925
GBR - England & Wales	3.82	2.988
Belgium – Wall.	3.92	3.066
Belgium – Fla.	4.14	3.238
Finland	4.41	3.449
GBR – Scotland	5.72	4.474
Denmark	6.70	5.240
<b>Average</b>		<b>2.535</b>

The average calculated is the same as that presented in the Task 2 report for Washing Machines. It is anticipated that water prices will rise as countries move towards the full cost recovery under the Water Framework Directive.

Taking into account growth and the move towards full cost recovery, the Task 2 report for Washing Machines proposed an average European household water plus sewage price of 3.7 Euro/m<sup>3</sup> for their study.

#### 2.4.6 Interest and Inflation Rates

**Table 34: Inflation Rate across Member States (%)**

geo\time	2005	2006	2007	2008	2009	2010
European Union	2.2	2.2	2.3	3.7	1.0	2.1
Austria	2.1	1.7	2.2	3.2	0.4	1.7
Belgium	2.5	2.3	1.8	4.5	0	2.3
Bulgaria	6	7.4	7.6	12	2.5	3.0
Cyprus	2	2.2	2.2	4.4	0.2	2.6
Czech Republic	1.6	2.1	3	6.3	0.6	1.2
Denmark	1.7	1.9	1.7	3.6	1.1	2.2
Estonia	4.1	4.4	6.7	10.6	0.2	2.7
Finland	0.8	1.3	1.6	3.9	1.6	1.7
France	1.9	1.9	1.6	3.2	0.1	1.7
Germany	1.9	1.8	2.3	2.8	0.2	1.2
Greece	3.5	3.3	3	4.2	1.3	4.7

<sup>23</sup> [http://www.oecd.org/document/47/0,3343,en\\_2649\\_37465\\_36146415\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/document/47/0,3343,en_2649_37465_36146415_1_1_1_1,00.html)

<sup>24</sup> Exchange Rate 1USD = 0.7821 Euros – 20<sup>th</sup> August 2010

Hungary	3.5	4	7.9	6	4	4.7
Ireland	2.2	2.7	2.9	3.1	-1.7	-1.6
Italy	2.2	2.2	2	3.5	0.8	1.6
Latvia	6.9	6.6	10.1	15.3	3.3	-1.2
Lithuania	2.7	3.8	5.8	11.1	4.2	1.2
Luxembourg	3.8	3	2.7	4.1	0	2.8
Malta	2.5	2.6	0.7	4.7	1.8	2.0
Netherlands	1.5	1.7	1.6	2.2	1	0.9
Poland	2.2	1.3	2.6	4.2	4	2.7
Portugal	2.1	3	2.4	2.7	-0.9	1.4
Romania	9.1	6.6	4.9	7.9	5.6	6.1
Slovakia	2.8	4.3	1.9	3.9	0.9	0.7
Slovenia	2.5	2.5	3.8	5.5	0.9	2.1
Spain	3.4	3.6	2.8	4.1	-0.2	2.0
Sweden	0.8	1.5	1.7	3.3	1.9	1.9
United Kingdom	2.1	2.3	2.3	3.6	2.2	3.3

Source: Eurostat <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&language=en&pcode=tsieb060&plugin=2>

**Table 35 Long term interest rate (10 years' average %)**

geoltime	2005	2006	2007	2008	2009	2010
EU (27 countries)	3.71	4.03	4.56	4.55	4.13	3.83
Euro area	3.42	3.84	4.32	4.3	3.82	3.62
Belgium	3.43	3.81	4.33	4.42	3.9	3.46
Bulgaria	3.87	4.18	4.54	5.38	7.22	6.01
Czech Republic	3.54	3.8	4.3	4.63	4.84	3.88
Denmark	3.4	3.81	4.29	4.28	3.59	2.93
Germany	3.35	3.76	4.22	3.98	3.22	2.74
Estonia	-	-	-	-	-	-
Ireland	3.33	3.76	4.31	4.53	5.23	5.74
Greece	3.59	4.07	4.5	4.8	5.17	9.09
Spain	3.39	3.78	4.31	4.37	3.98	4.25
France	3.41	3.8	4.3	4.23	3.65	3.12
Italy	3.56	4.05	4.49	4.68	4.31	4.04
Cyprus	5.16	4.13	4.48	4.6	4.6	4.60
Latvia	3.88	4.13	5.28	6.43	12.36	10.34
Lithuania	3.7	4.08	4.55	5.61	14	5.57
Luxembourg	2.41	3.3	4.46	4.61	4.23	3.17
Hungary	6.6	7.12	6.74	8.24	9.12	7.28
Malta	4.56	4.32	4.72	4.81	4.54	4.19
Netherlands	3.37	3.78	4.29	4.23	3.69	2.99
Austria	3.39	3.8	4.3	4.36	3.94	3.23
Poland	5.22	5.23	5.48	6.07	6.12	5.78
Portugal	3.44	3.91	4.42	4.52	4.21	5.40
Romania	:	7.23	7.13	7.7	9.69	7.34
Slovenia	3.81	3.85	4.53	4.61	4.38	3.83
Slovakia	3.52	4.41	4.49	4.72	4.71	3.87
Finland	3.35	3.78	4.29	4.29	3.74	3.83
Sweden	3.38	3.7	4.17	3.89	3.25	2.89
United Kingdom	4.46	4.37	5.06	4.5	3.36	3.36

Source: Eurostat <http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&plugin=1&language=en&pcode=tec00097>

## 2.5 Specific Issues related to Ecolabel and GPP Schemes

The research undertaken has highlighted a paucity of data to enable a full understanding of the range of product performance and in particular details on the spread of products across the different performance levels.

However an assessment of existing GPP and ecolabel schemes and other sources has provided an indication of the range of product performance and in particular what is currently considered appropriate for such labels. This will be useful when developing European Ecolabel criteria specifically for taps and showerheads.

Both the EU Ecolabel for Tourist Accommodation Services<sup>25</sup> and Campsite Service<sup>26</sup> include criteria relating to water flow from taps and showers. The latest criteria, which were published in July 2009 are summarised in Table 36.

**Table 36 Summary of requirements for taps and showerheads in European Ecolabels**

European Ecolabel	Mandatory Criteria	Optional Criteria
Tourist Accommodation Service	The average water flow of the taps and shower heads, excluding kitchen and bath tub taps, shall not exceed 9 litres/minute.	The average flow from all taps and shower heads excluding bath taps shall not exceed 8 litres/minute.
Campsite Service	The average water flow of the taps and shower heads excluding bath tub taps, kitchen taps and filling stations shall not exceed 9 litres/minute.	The average flow from all taps and shower heads excluding bath taps and filling stations shall not exceed 8 litres/minute.

A large number of individual countries have also established ecolabels for tourist accommodation or similar and include requirements relating to taps and showerheads. These are summarised in the Task 1 report<sup>27</sup>. The focus is on flow rates, however as it is part of an ecolabel for a different service, there are no other specific requirements relating to taps or showerheads.

The Austrian ecolabel provides criteria for 'Water and energy saving sanitary fittings', although to date there are no licensees. The latest version of the criteria (July 2007) includes requirements relating to the following:

- Flow rates; 6 litres/minute for sanitary fittings, 9 litres per minute for kitchen taps and 12 litres per minute for shower and tub facets.
- Restrict water through flow on hand mixers - water through flow of the tap can be restricted to  $\leq 60$  % of the maximum through flow volume, in relation to  $0.3 \pm 0.02$  MPa ( $3 \pm 0.2$  bar) flow pressure.
- Ten year warranty for spare parts and a 10 year guarantee.
- Designed for ease of repair without the need for specialist tools, unless supplied.
- Reference to appropriate legislation including Food Safety and Consumer Protection Act and regulatory requirements in relation to air, water, land emissions and worker protection.
- Packaging – no halogenated plastics and the provision of packaging take back or details of appropriate collection facilities.

Research has indicated that there are currently limited GPP criteria for taps and showerheads among the main European countries<sup>28</sup> to have implemented GPP schemes. Belgium are currently devising

<sup>25</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:198:0057:0079:EN:PDF>

<sup>26</sup> <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:196:0036:0058:EN:PDF>

<sup>27</sup> <http://susproc.jrc.ec.europa.eu/ecotapware/stakeholders.html#documents>

<sup>28</sup> Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden, and the United Kingdom, together with Norway

their GPP criteria for taps and showerheads<sup>29</sup>, however it is proposed to base this on the Austrian ecolabel detailed above.

The UK also has GPP criteria<sup>30</sup>, which currently highlights best practice as products that meet the requirements for UK's Water Technology List (WTL)<sup>31</sup>. The WTL covers the categories of taps and showerheads shown in Table 37.

**Table 37 Categories of taps and showerheads covered by the UK Water Technology List**

Category	Sub-category	Requirements
<b>Taps:</b>		
Automatic shut off taps		limit flow rate to 6 litres per minute
Electronic taps	Presence detection operated taps	limit flow rate to 6 litres per minute and terminate supply within 3 seconds of user intervention being removed
	Timer control operated taps	limit flow rate to 6 litres per minute and the duration of the flow shall not exceed 20 seconds
Low flow screw-down/lever taps		limit flow rate to 6 litres per minute
Spray taps		limit flow rate to 6 litres per minute
<b>Showerheads:</b>		
Aerated showerheads		limit flow rate to 9 litres per minute
Auto shut off showers	Electromagnetic systems	limit flow rate to 9 litres per minute and terminate supply within 3 seconds of user intervention being removed for presence detection systems and terminate supply after 2 minutes for time flow operated systems
	Mechanical and pneumatic push systems	limit flow rate to 9 litres per minute and terminate supply after 2 minutes
Flow regulators		flow rate of no more than 9 litres per minute
Low Flow Showerheads		flow rate of no more than 9 litres per minute
Thermostatic Controlled Showers		a thermostatic mixing valve that enables the control of water flow and temperature, either via a single control device or separate control devices, and is approved by the TMV3 scheme with E designation

In addition to these national GPP criteria, water saving measures are included in the EU GPP criteria for Construction. There are no requirements for showerheads, for taps it includes the following:

- Tap inserts should save at least 50% of water compared to normal tap use.

It is clear from the above schemes that there is a generally a level of consistency in relation to the showerhead flow rate requirements, typically around 9 litres / minute. For taps the limits vary, but this may depend on the actual scope of taps included. This aside there is some variation, for example between the European Ecolabel and UK WTL list requirements.

<sup>29</sup> <http://www.gidsvoorduurzameaankopen.be/?q=en/node/47&cid=124&pid=573>

<sup>30</sup> <http://www.defra.gov.uk/sustainable/government/advice/public/buying/products/construction/index.htm>

<sup>31</sup> <http://www.eca-water.gov.uk/>



Stakeholder feedback from the first questionnaire also indicates a range of flow rates for different products, however again there is a lack of data availability against the different flow rates to indicate how many products on the market meet these typical flow rates.

Following on from the range of standards set in Ecolabel and GPP schemes, the Bathroom Manufacturers Association also have a Water Efficiency Labelling scheme<sup>32</sup>, which includes taps and showerheads. An analysis of the products currently registered (9<sup>th</sup> August 2010) is provided in Table 38 and Table 39 and indicates the number of products in relation to flow rate.

**Table 38 Summary of taps registered under the Water Efficiency Labelling Scheme**

Flow Rate (litres /minute)	Number of products	Notes
1.7	3	Basin Taps
3	3	Basin Taps
4	30	Basin Taps
4.7	29	Basin Taps
5	50	Basin Taps
6	38	Includes some bath taps
8	19	Includes mainly bath taps but also taps sold with a flow restrictor (4 litres / minute)

**Table 39 Summary of showerheads registered under the Water Efficiency Labelling Scheme**

Flow Rate (litres /minute)	Number of products
6	3
9	1
10.3	1

Portugal also has a labelling scheme for showers, however only 5 products have been registered to date<sup>33</sup>, four meet Class A ( $5 < Q \leq 7.2$ ) and one Class B ( $7.2 < Q \leq 9$ )<sup>34</sup>. There are no labelled products for taps as the criteria are still in draft.

Since this project began, the WELL product classification system<sup>35</sup> has been introduced. The system was launched at the ISH fair held in Frankfurt in March 2011. The system allows products to be labelled providing an indication of their performance against a number of set criteria. A given number of stars are awarded to the product assessed, which is then converted into an A-F rating for non-domestic products or A-D rating for domestic products. The criteria are summarised in Figure 3 and Figure 4 respectively for taps and showerheads. Further information can be found on the WELL classification system website.

<sup>32</sup> <http://www.water-efficiencylabel.org.uk/>

<sup>33</sup> [http://www.anqip.pt/index\\_ficheiros/Page394.htm](http://www.anqip.pt/index_ficheiros/Page394.htm)

<sup>34</sup> Q is water flow rate l/min

<sup>35</sup> <http://www.well-online.eu/>

### Basin Taps:

Evaluation criterion	Performed by	Evaluation
Volume (flow rate)	Pressure-dependent, restrictive solution > 6.0 l/min and ≤ 9.0 l/min	★
	Pressure-independent, volume-regulating solution ≥ 4.0 l/min and ≤ 6.0 l/min	★ ★
Temperature	Flow rate-independent temperature setting	★
	Temperature limit and cold water valves	★ ★
Time (omitted for Home)	Time-controlled self-closing valves with or without sensor activation	★
	Sensor valves with use-dependent on/off function	★ ★
		<b>TOTAL max. 6 stars</b>

### Kitchen Taps:

Evaluation criterion	Performed by	Evaluation
Volume (flow rate)	Pressure-dependent, restrictive solution > 9.0 l/min and ≤ 12.0 l/min	★
	Pressure-independent, volume-regulating solution ≥ 6.0 l/min and ≤ 9.0 l/min	★ ★
Temperature	Flow rate-independent temperature setting	★
	Temperature limit and cold water valves	★ ★
Time (omitted for Home)	Time-controlled self-closing valves with or without sensor activation	★
	Sensor valves with use-dependent on/off function	★ ★
		<b>TOTAL max. 6 stars</b>

**Figure 3: WELL criteria for basin and kitchen taps**

From: [http://www.well-online.eu/config/media/files/159\\_WaterEfficiencyLabelling\\_20110302\\_EN.pdf](http://www.well-online.eu/config/media/files/159_WaterEfficiencyLabelling_20110302_EN.pdf)

Evaluation criterion	Performed by	Evaluation
Volume (flow rate)	Pressure-dependent, restrictive solution > 9.0 l/min and ≤ 12.0 l/min	★
	Pressure-independent, volume-regulating solution ≥ 4.5 l/min and ≤ 9.0 l/min	★ ★
Temperature	Flow rate-independent temperature setting	★
	Temperature limit and cold water valves	★ ★
Time (omitted for Home)	Time-controlled self-closing valves with or without sensor activation	★
	Sensor valves with use-dependent on/off function	★ ★
		<b>TOTAL max. 6 stars</b>

**Figure 4: WELL criteria for showers**

From: [http://www.well-online.eu/config/media/files/159\\_WaterEfficiencyLabelling\\_20110302\\_EN.pdf](http://www.well-online.eu/config/media/files/159_WaterEfficiencyLabelling_20110302_EN.pdf)

In addition to the schemes highlighted above, an energy labelling scheme for sanitary tapware has been developed in Sweden. This includes a methodology for assessing the energy efficiency of products such as taps and showerheads. The standards could constitute a useful basis for a discussion on energy efficiency of sanitary tapware at a European level.

The following documents have been published by the Swedish Standards Institute:

- SS 82 00 00 Sanitary tapware–Method for determination of energy efficiency of mechanical basin and sink mixing valves (February, 2010).
- SS 82 00 01 Sanitary tapware–Method for determining the energy efficiency of thermostatic mixing valves with showers (December, 2010)
- Certification rules for energy classing and labelling of sanitary tapware (22nd February 2011).

The scheme is overseen by the Swedish Energy Agency, who agreed to provide further details for dissemination to stakeholders following the project meeting in March 2011 which was held in Seville.

For ecolabel and GPP criteria development, factors in addition to the flow rate will need to be considered. A look at the requirements included in the Austrian ecolabel provides insights, and also the WTL criteria. The main points for further consideration are included below:

- Terminate supply e.g. automatic taps
- Flow durations
- Durability
- Flow rates for different types of taps
- Provision of spare parts
- Guarantees
- Designed for ease of repair
- User Information
- Packaging

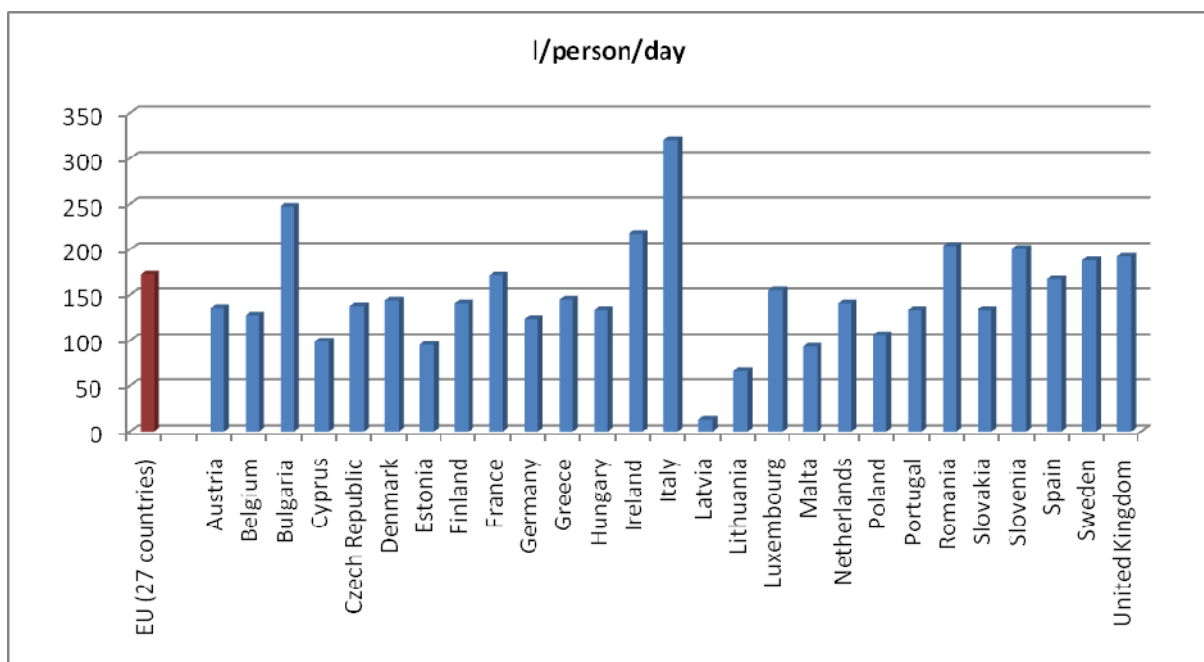
Many of these are common to the development of ecolabel criteria for different product groups and are usually discussed and consensus reached as part of the ad-hoc working group meetings. These meetings also serve as a good platform on which to discuss potential uptake of an ecolabel for the product group under development and any barriers that may need to be overcome to ensure the Ecolabel will be supported by industry.

## 3 Task 2 - User behaviour

### 3.1 Introduction

On average, only 18% of total water abstraction in Europe is used for urban use. The proportion of water for abstracted urban use varies considerable from one region to another, depending on natural conditions and economic and demographic structures. This can range from 6.5% in Germany to more than 50% in the United Kingdom<sup>32</sup>.

Figure 5 illustrates that the daily consumption of domestic water in litre per person and day across member states vary hugely, from a mere 67 l/person/day in Lithuania to a considerable 320 l/person/day in Italy. The very low value for Latvia (of 13 l/person/day) seems to be an outlier, which can probably be attributed to statistical inconsistencies. The European average is 173 l/person/day. Using data on population this equates to 30,198 million m<sup>3</sup>.



**Figure 5: Total domestic water use by member states**

Source IPTS Scoping Document, February 2010<sup>36</sup>

Higher standards of living are changing water demand patterns. This is reflected mainly in increased domestic water use, especially for personal hygiene. Most of the European population nowadays have indoor toilets, showers and/or baths for daily use. The result is that most of urban water consumption is for domestic use. Most of the water used in households is for toilet flushing (33%) bathing and showering (20-32%), and for washing machines and dishwashers (15%). The proportion of water used for cooking and drinking (3%) is minimal compared to the other uses<sup>37</sup>.

It is expected that these figures will vary from one member state to another but nevertheless water consumption from taps and showerheads will always account for a significant proportion of the water used in homes as outlined by the examples below.

- In the UK shower and bathing count for 20% of annual water use in households, showering represents approximately 10%, while 25% of domestic water consumption is delivered via internal taps<sup>38</sup>. In the Netherlands the use of water per person has decreased overall by 7% between 1995 and 2007. However, water use per person per day for showering has increased

<sup>36</sup> [http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document\\_WuP\\_100217.pdf](http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document_WuP_100217.pdf)

<sup>37</sup> Freshwater in Europe: Facts, Figures and maps, UNEP, 2004

<sup>38</sup> MTP UK, Improving the water efficiency of internal taps, March 2008

from 38,3 litres to 49,8 litres per person per day. The share of the water used for showering now represents 39% of overall household water consumption, the largest share (in 2007).<sup>39</sup>

- The UK Code for Sustainable Homes has been introduced to drive a step-change in sustainable home building practice. It is a standard for key elements of design and construction which affect the sustainability of a new home. It proposes standards for sustainable houses in terms of potable water use between 120l/p/d and 80l/p/d. Comparing this to the average EU consumption of (150 l/p/d) the average for Europe water saving potential can be estimated between 18% (122 l/p/d) and 47% (80 l/p/d).<sup>40</sup>

Table 40, below shows that for most Member States, bathing and showering account for around 33 to 36% of the total domestic water consumption, it is the highest in Netherlands representing 42% and lowest in Finland at 19%.

**Table 40: Total domestic water use according to purpose in Million m<sup>3</sup> per year**

Country	Bathing/ showering/ personal hygiene	toilet flushing	washing clothes	dish washing	room cleaning, garden irrigation, car wash	Drinking and cooking	Other	TOTAL
Austria	162	97	65	8	24	16	28	400
Belgium	158	173	67	34	38	10		480
Bulgaria	243	178	101	60	40	33	63	718
Cyprus	9	6	4	2	1	1	2	25
Czech Republic	175	128	73	44	29	24	45	518
Denmark	93	71	34	28	n/a	20	37	283
Estonia	16	12	7	4	3	2	4	48
Finland	78	38	48	33	5	11	56	269
France	1,511	775	465	388	233	271	233	3,876
Germany	1,334	1,000	445	222	222	148	333	3,704
Greece	197	144	82	49	33	27	51	583
Hungary	168	123	70	42	28	23	43	497
Ireland	106	77	44	26	18	14	27	312
Italy	2,281	1,670	948	568	377	312	589	6,745
Latvia	4	3	2	1	1	1	1	13
Lithuania	29	21	12	7	5	4	7	85
Luxembourg	9	8	3	2		1	2	25
Malta	4	3	2	1	1	1	1	13
Netherlands	345	230	148	41	n/a	8	58	830
Poland	500	366	208	125	83	68	129	1,479
Portugal	171	125	71	43	28	23	44	505
Romania	555	406	231	138	92	76	143	1,641
Slovakia	89	65	37	22	15	12	23	263
Slovenia	50	36	21	12	8	7	13	147
Spain	922	691	512		n/a	307	128	2,560
Sweden	185	123	92	123	n/a	31	62	616
United Kingdom	1,375	1,250	542	333	292	167	208	4,167
<b>EU-27</b>	<b>10,769</b>	<b>7,821</b>	<b>4,330</b>	<b>2,356</b>	<b>1,575</b>	<b>1,617</b>	<b>2,330</b>	<b>30,798</b>

Source: IPTS scoping document (IPTS calculated these using derived data)

<sup>39</sup> This information was received in response to the first questionnaire from the Ministry of Housing, Spatial Planning and the Environment in the Netherlands

<sup>40</sup> Water saving devices – Euroconsumers technical report C17050, Decp Prteste, 2008

The application and efficiency of different technologies used in household can vary greatly between Member States. Thus Table 41 below shows that a shower may use as much as 60l per shower in Finland, compared to as little as 16l in France.

**Table 41 Comparison of domestic water consumption by Member States**

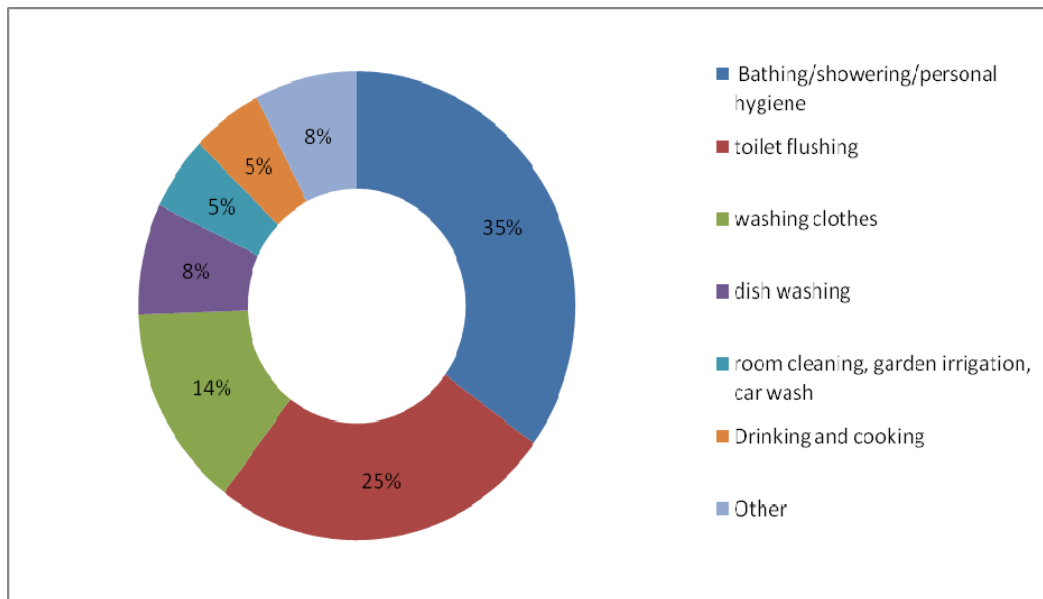
Appliance	England and Wales	Finland	France	Germany
Toilet	9.5 l/flush	6 l/flush	9 l/flush	9 l/flush
Washing Machine	80 l/cycle	74-117 l/cycle	75 l/cycle	72-90 l/cycle
Dishwater	35 l/cycle	25 l/cycle	24 l/cycle	27-47 l/cycle
Shower	35 l/shower	60 l/shower	16 l/minute	30-50 l/shower
Bath	80 l/bath	-	-	-
Water Saving Appliances	No incentive for the majority of households to conserve water, but commerce and industry have invested in flush controllers for urinals, push operation taps, low-volume shower heads and devices to limit toilet flush volume	The amount of water per flush in toilets depends mainly on the construction year of the building: Prior to 1976, 9 l/flush; 1976-93, 6 l/flush; 1993-96, 4 l/flush; Since 1996, 2-4l/flush	Domestic water saving Appliances are not widespread	Some municipalities have invested heavily in installing water-saving devices and increasing public awareness

Source: [http://ec.europa.eu/environment/water/quantity/pdf/water\\_saving\\_1.pdf](http://ec.europa.eu/environment/water/quantity/pdf/water_saving_1.pdf)

Figure 6 below shows that bathing/showering/ personal hygiene are the activities consuming the most of domestic water (35%). Though it should be noted that domestic water consumption for showering and bathing vary widely between member states<sup>41</sup>:

- Austria 24% is used for bathing and a further 16% for showering
- Spain 36% is used for showering, bathing is not reported (but is included in the 5% classified as others)
- In the UK the shares varies from 9% to 15% for bathing and 8% and 23% for showering (depending on the reference)

<sup>41</sup> Source IPTS Scoping Document, February 2010 - [http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document\\_WuP\\_100217.pdf](http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document_WuP_100217.pdf)



**Figure 6: Domestic water use in the EU-27 according to purpose**

Source: Derived using data from IPTS Scoping Document, February 2010<sup>42</sup>

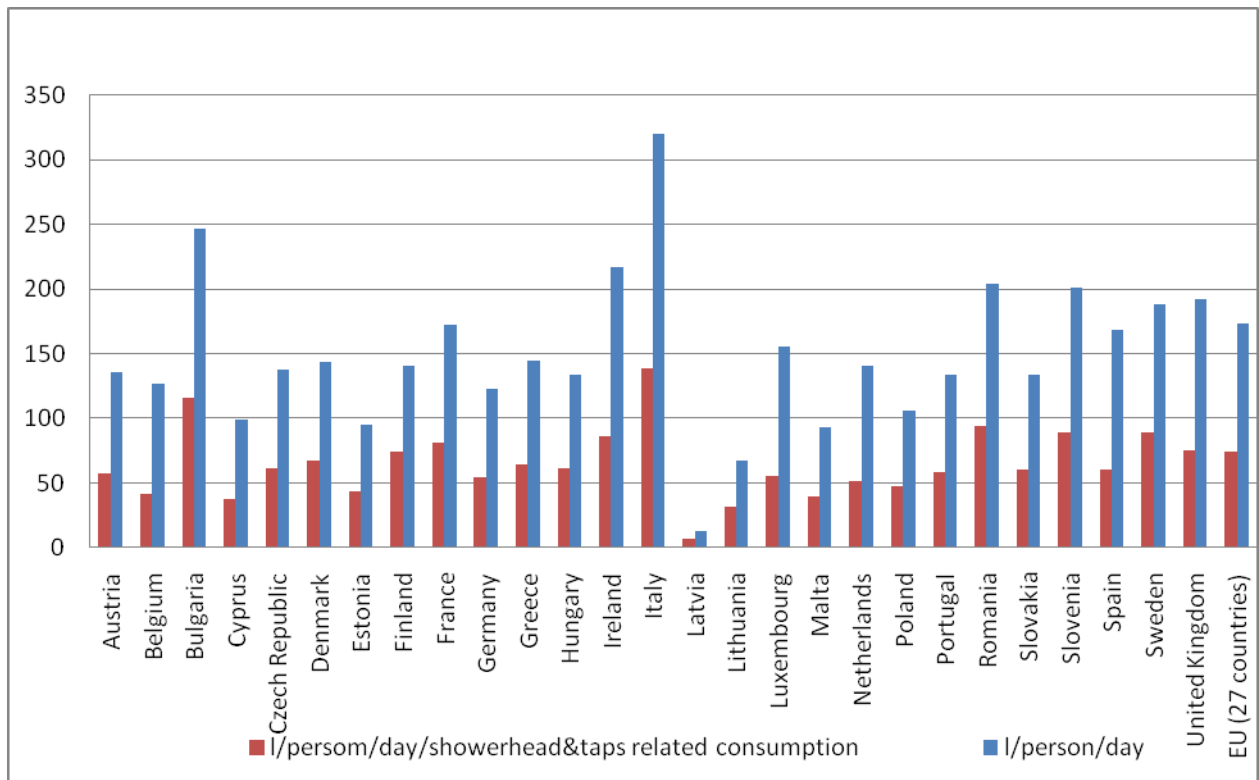
Figure 7 below compares the overall daily domestic water consumption per person (in litres) against the domestic water usage that is purely from taps and showerheads. This includes the following activities and the assumption made on the consumption arising from these activities that would be from taps and/or showerheads:

- personal hygiene (bathing and showering): 60% for showering and other personal hygiene e.g. hand washing, washing and teeth brushing, the remaining 40% is assumed to be for bathing.
- washing clothes: 5% of water consumption is from taps
- dish washing: 75%
- room cleaning, garden irrigation and car wash: 77%
- drinking and cooking,.: 100%
- other: 100%

The assumptions are based on few data available for some of member states on water consumption according to purposes, and so should be use carefully.

It can be noted that for most member states the water consumption arising from taps or showerheads, represents more than 50% of the overall domestic water consumption.

<sup>42</sup> [http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document\\_WuP\\_100217.pdf](http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document_WuP_100217.pdf)

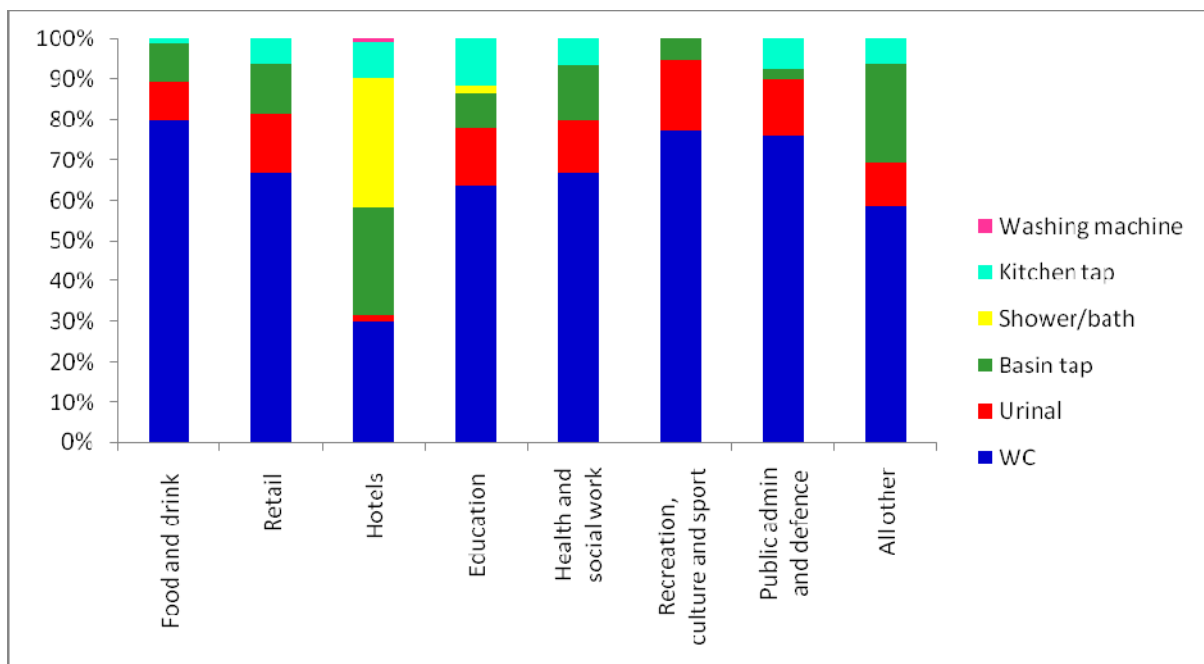


**Figure 7: Water consumption per person per day overall vs. water consumption from activities using taps % showerheads**

Source: Derived using data from IPTS Scoping Document, February 2010<sup>43</sup>

### Water consumption in Non-domestic building

Very little information is available regarding water consumption in non-domestic sources. Figure 8 below present's water consumption in different sectors in the UK.



**Figure 8: Water consumption in non-domestic premises**

Source : MTP, Domestic water consumption in doemstic and non-domestic properties, DEFRA/AEA 2008

<sup>43</sup> [http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document\\_WuP\\_100217.pdf](http://susproc.jrc.ec.europa.eu/ecotapware/docs/Scoping%20document_WuP_100217.pdf)



Table 42 below presents data from a french region where water consumption within public buildings has been estimated, and potential saving identified.

**Table 42: Water consumption and potential saving in public building in Loire Bretagne (France)**

	Consumption of reference	Savings potential	Source
Primary school	3m <sup>3</sup> / child/year	20%	Lorient, Pontivy, Brest, Douarnenez, Lannion, Perros, Guirrec
College	General : 3,6 m <sup>3</sup> /student/year	18%	Conseil régional de Bretagne
	Professional: 6,1m <sup>3</sup> /student/year		
Student housing	46,7 m <sup>3</sup> / bed/year	30%	CROUS Aquitaine, Eco-Campus
Stadium (normal size)	1000m <sup>3</sup> /year for equipment use	20%	Surveys CNFPT Midi Pyrénées 2002, AIRES 1998, Report L. Cathala
	2000m <sup>3</sup> /year for irrigation		
Gymnasium (normal size)	800 m <sup>3</sup> /an	15%	
Public swimming-pools	0,33 to 0,42 m <sup>3</sup> / visitor	no data	
Hospitals	100 m <sup>3</sup> / bed/year	0%	Water agency data, experts
Administrative buildings	14,3 m <sup>3</sup> / position/year	20%	Water agency data

Source [http://ec.europa.eu/environment/water/quantity/pdf/water\\_saving\\_1.pdf](http://ec.europa.eu/environment/water/quantity/pdf/water_saving_1.pdf)

A separate study on evaluating the success of water saving devices was completed in the south of France in a Student housing complex of Talence (CROUS). The equipment implemented were: water meters in each building and sanitary blocks, water savings taps, water savings showerheads and low water consuming flush toilets. The results in terms of water use per student bed were: 157 litres /day/bed in non equipped buildings, and 100 litres /day/bed in equipped area. It represents a saving of 35% for total water use and 45% for hot water. Equipment cost were 4 712 euros and the water cost avoided reached 11 000 euros/year; the payback period was about 6 months.<sup>44</sup>

A final point to note that may be of increasing interest in the future is the impact climate change might have on the demand of water and how it is used. No data for Europe has been identified, however a correlation between temperature and domestic water use has been shown by several studies for the US, particularly for periods of peak demand. A statistical analysis of water use in New York City showed that when daily temperatures are above 25°C, per-capita water use increases by 11 litres per 1°C (roughly 2% of current daily per capita use).<sup>45</sup>

## 3.2 Subtask 2.1 – User Information

Providing user information coupled with guidance through product design can influence user behaviour and reduce in use water and energy consumption, and reduce environmental impacts. The effectiveness of this information depends largely on what information is provided, its quality, how it is distributed and presented to users.

This section will consider the following with respect to the provision of user information.

- Analyse if product users should be provided with information on the role they can play in using the product in a sustainable manner.
- What product information could be provided to enable consumers to use the products sustainably, such as typical water and energy consumption, power and water management capabilities.

<sup>44</sup> Source [http://ec.europa.eu/environment/water/quantity/pdf/water\\_saving\\_1.pdf](http://ec.europa.eu/environment/water/quantity/pdf/water_saving_1.pdf)

<sup>45</sup> EU Water Saving potential (Part 1 – Report), 2007 [http://ec.europa.eu/environment/water/quantity/pdf/water\\_saving\\_1.pdf](http://ec.europa.eu/environment/water/quantity/pdf/water_saving_1.pdf)

- Barriers and restrictions to possible user information and Ecodesign measures due to social or infra-structural differences.

The water consumption of taps and showerhead is for the majority controlled by the end users, independently of the product water flow restrictions. It is clear that user behaviour can play a key role in the environmental impact of taps and showerheads; therefore the provision of information that can influence this behaviour and the environmental impact is important.

Further information regarding user behaviour characteristics is provided in Section 3.3, however it is clear that the user information provided with a product needs to convey the key messages to establish responsible behaviour in end users. User information is always provided with a product sold, although the level of information provided may vary, as can the method of delivery, for example through printed leaflets/instructions included with the product or via manufacturers websites.

The European Ecolabels for tourist accommodation services and campsite services include specific criteria relating to the provision of information to guests, including the following:

#### **Information to guests**

“The campsite shall provide information to the guests, including conference participants, on its environmental policy, including safety and fire safety aspects, inviting them to contribute to its implementation. The information conveyed to the guests shall refer to the actions taken on behalf of its environmental policy and provide information about the Community eco-label. This information shall be actively given to the guests at the reception, together with a questionnaire covering their views about the environmental aspects of the campsite. Notices inviting guests to support the environmental objectives shall be visible to the guests, especially in the common areas and the rental accommodation. Specific actions for the different areas shall be:

#### **Concerning water and waste water:**

- In the sanitary areas and bathrooms there shall be adequate information to the guest on how to help the campsite to save water. “

#### **Information appearing on the eco-label**

“Box 2 of the eco-label shall contain the following text:

- This campsite is actively taking measures to use renewable energy sources, save energy and water, to reduce waste, to improve the local environment.”

The provision of information in this form would not necessarily be appropriate for the domestic use of taps and showerheads. These two European Ecolabels are aimed at the provision of a service, and for those providing the service to ensure adequate information is provided to the guests. The European Ecolabel does not indicate the type of information that should be provided to guests.

Increasingly manufacturers provide a wealth of information to their customers about how best to use their products for maximum enjoyment as well as best performance in terms of water and energy usage. They also provide more generic tips on saving water. Typically the type of information that is being provided includes but may not be limited to the following:

- Don't let the water run when washing your hands, brushing your teeth or shaving. Depending on your mixer, you lose about 7 to 20 litres of water this way – per minute.
- For a full bath, you need about 140 litres of water. Showering, however, consumes far less water. The most economic shower, which uses only 6 litres per minute, will consume 18 litres of water for a three minute shower - without sacrificing comfort.
- “If solar energy is unavailable, heating water is bound to require fossil fuels. Therefore, those who save hot water reduce the production of greenhouse gas. In a household with four people, water-saving showers can reduce the consumption of carbon dioxide by up to 700 kg per year.”<sup>46</sup>
- Install water recycling device - A domestic grey water recycling system, which can be easily integrated into the planning of new homes or reconstruction projects, purifies the water used in bath and shower and makes it available as clear water – for example for flushing the toilet or watering the garden. Even collecting rain water by means of a water butt can have a significant impact.

<sup>46</sup> <http://www.hansgrohe.co.uk/en/76639.htm>

- Choose fittings with a thermostat and water flow limiter.
- Repair dripping taps

This type of information is often made available through manufacturers' websites. It is important to ensure that the end user knows where to access relevant water saving information and tips.

Information on type of water system a product can be used with i.e. low / high pressure systems should also be included, although this is more applicable for the installation rather than the end user. A number of key barriers have been identified when considering the provision of information to the user. These are as follows:

- Taps and showerheads are often installed by professionals e.g. plumbers who in general will not leave product notices behind.
- In non-domestic premises the end user is different to the buyers and installers.

The first of these has been recognised by the Austrian ecolabel, which includes criteria that require the plumber/fitter to ensure that product information is left with the end user. In non-domestic premises water saving tips and information could be displayed as appropriate, similar to the requirements in the European Ecolabel. However this would generally be related to the specific circumstances and policies of individual companies and organisations.

Some manufacturers go further and provide more general information aimed at informing their customers of the wider environmental impact their purchasing or lifestyle choices/actions can have. This may include information relating to embedded water in products or water saving tips beyond the use of taps and showerheads, for example when best to water plants and gardens.

A Defra consumer survey published in 2007<sup>47</sup> indicated that information on the following would potentially promote the take up of water efficient bathroom fittings:

- Respondents were asked what would promote take up of water efficient bathroom fitting:
  - 60% mentioned information on possible operational cost savings
  - 55% mentioned discount vouchers
  - 46% wanted information on how much water the product uses
  - 39% wanted information on using water carefully

This is reflected in some of the information already highlighted above, and should be considered further as part of the development of future ecolabel / GPP criteria.

An example tap, purchased as part of this project came with documentation which included the following:

- Assembly instructions, which outlined the tools required
- A note that the tap must be installed in compliance with relevant legislation, in this case the UK Water Bylaw Regulations
- Details of the minimum working pressure (0.2 bar)
- A customer services contact number

### 3.3 Subtask 2.2 – User behaviour in the use phase

It is important to understand and define how users actually use the product. This is especially important for taps and shower as even the most water efficient product will only be efficient if the consumer uses the product adequately. The main questions around the use phase behaviour is how

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<sup>47</sup> Defra Consumer attitudes to the water efficiency of bathroom fittings: quantitative research (2007) (sample of 1,088 respondents)

long do users leave the water running each time they use a tap and how often do they shower and how long they spend in the shower.

For water efficient products to be truly effective and for there to be true acceptance by consumers, stakeholders highlighted the need for a significant education programme aimed at end users. It is well known that users will answer survey questions regarding water efficient products in a positive way but when it comes to their own actual usage then the situation is very often quite different. Education can be used to help maximise water efficiency and the associated savings.

In addition potential targets and regulations can play a critical role in the user behaviour and the usage pattern of the product. The following have been identified in the UK.

- The Government's strategy for Water in the UK, set out in Defra's 'Future Water' publication sets out the Government's aim to reduce water consumption to 130 litres per person per day by 2030 and possibly to 120 litres per person per day depending upon new technological development and innovation. It is currently 150l/person/day.
- The 2004 Housing Act: came into force in April 2006, and may influence the refurbishment market. It affects owners of Houses in Multiple Occupation (HMO), i.e. owners of a property originally built or designed for one household but converted for multiple occupancies. Owners are now required to equip each bedroom with a washbasin and include two bathrooms or shower units as well as a separate toilet if more than five sharers occupy the property.
- The impact of compulsory water metering between 2010 and 2020 will affect 4.38 million homes and influence the frequency of internal tap use in each home which will result in a reduction in use by 1%

The remainder of this section outlines the usage patterns identified from desk based research and stakeholder feedback, along with observations relating to repair and maintenance, product life time and best practice.

### 3.3.1 Usage Patterns - Taps

The MTP established that in the UK approximately 25% of domestic water consumption, equivalent to approximately 38 litres per person per day, is delivered via internal taps. There is generally a significant difference between the flow rate that a tap is capable of delivering at a specified pressure ('nominal flow rate') and the flow rate of the tap in use ('actual flow rate'). This is because the water pressure at the point of installation will usually be slightly different and the user rarely turns a tap on to its maximum flow rate.

Whilst there are significant differences in the nominal flow rate of taps designed for kitchen and basin uses, evidence gathered by MTP suggests there is little, if any, difference in the actual flow rate of the different types in use. The average volume of water per tap use in homes is **2.3 litres**. However, evidence shows that taps delivering flow rates greater than 1.8 litres per minute have an average volume per use of 1.9 litres, whilst those with a flow rate of less than 1.8 litres per minute have an average volume per use of 3.1 litres. It is concluded that it is unlikely that more efficient taps are run for longer as there are many events of high volume for a range of durations at high and low flow rates, the causal factors for these trends are unknown.

In the UK households of one to six occupants, have an average frequency of use for all taps of 39 uses per household per day in 2007<sup>48</sup>.

The MTP's information suggests an average amount of water used for all taps in a household is of 2.3 (average volume of per tap use) \* 39 (average number of taps uses per day) = 89.7 litres / day.

**Kitchen tap frequency of use:** The frequency of kitchen tap use varies according to, amongst other factors, whether a household owns, and uses, a dishwasher. In homes where a dishwasher is installed it is estimated that kitchen taps are used on average just over 17 times a day per household. In homes where no dishwasher is used, kitchen taps are used on average just over 24 times a day per

<sup>48</sup> MTP UK: BN DW TAPS: Briefing Note relating to projections of internal tap water consumption, March 2008

household. This is equivalent to 55% of all tap uses across all homes. The overall frequency of kitchen and utility tap usage is therefore expected to reduce slowly as the increase in households owning and using dishwashers continues.

**Basin tap frequency of use:** Basin taps are thought to account for the remaining 45% of all internal tap uses in domestic properties. This is equivalent to 50% of tap uses in homes with dishwashers, and 41% of tap uses in homes without dishwashers.

Further information for different member states relating to taps usage patterns was not identified in this research.

### 3.3.2 Usage Patterns – Showers

Taking a shower can save water compared to taking a bath; some sources say a 33% saving is possible. However the extent of the potential saving is being impacted by developments in the way in which homes are designed (or refurbished) and modern fitments. For example, en-suit bathrooms and 'power showers' using auxiliary electric pumps, tend to reduce potential water savings as people take more frequent showers using equipment that delivers more water per unit of time.

Obviously, high flow rates can be turned down but the shower may not perform as well as a purpose-designed low flow showerhead. Trials by the Building Research Establishment (BRE) in the UK suggest that most people find flow rates of less than three litres per minute in a shower unacceptable. However, it is commonly seen that high flow rates are a key feature of a shower and some consumers may be put off from buying a lower flow rate shower due to concerns over how effective or comfortable it may be<sup>49</sup>.

The issue here appears to relate to public perceptions. This is a difficult issue to address through measures such as an ecolabel. User information provided as part of any ecolabel requirements may provide some information and education, however to ensure wider coverage of these issues a change in product marketing and consumer perceptions may be required.

With showers that do not incorporate any water saving features the amount of water a shower uses depends very much on the person using it, for example what flow setting they are using and how long they shower. A quick three minute shower with the flow adjusted to a comfortable 5 litres per minute uses only 15 litres of water, whilst 10 minutes at 15 litres per minute will use ten times as much water and energy without enhancing the cleaning function.

A survey undertaken by Waterwise in the UK identified shower times as follows:

- Reported shower times differ for weekdays (6.93 minutes) and weekends (7.59 Minutes).
- Younger people (under 35) shower for longer, on average 2.16 minutes more on weekdays.

Information from the US Manufacturer, American Standard Group supports the above findings. Their website<sup>50</sup> states that a typical shower lasts approximately 8 minutes.

People however might not be as conscious of saving water, which is why limiting the maximum flow rate can bring about savings, rather than just relying on people to adjust their behaviour. The majority of the showerheads have no flow regulation and so the maximum flow rate is only limited by the available water pressure.

'Water-saver' showerheads usually work by creating finer drops or by incorporating air into the flow. Typically, these showerheads require a pressure of at least one bar, which is available from mains pressure and pumped systems but rarely from gravity-feed hot water systems. These water-saver showers typically work at a flow rate of between four and nine litres per minute, and the effect is usually perceived as a 'power shower' but with perhaps half the flow rate.

Typical flow rates from different shower designs can be seen in Table 43 below.

<sup>49</sup> MTP BNWATSH01: Consumer views about showers - summary report

<sup>50</sup> <http://www.responsiblebathroom.com/education/stream/water-saving-facts/a-bluer-bathroom/>

**Table 43: Shower flow rates [source: UK Environmental Agency]**

	4 litre / minute	7.2kW electric	9.8kW electric	6 litre / minute water saver"	9.5 litre / minute water saver"	Power shower
Flow litre / minute	4 l/min	3.5 l/min 30°C temp rise	4.7 l/min 30°C temp rise	6 l/min regulated flow	9.5 l/min regulated flow	Typically 12 + l/min
Notes	Can be effective but probably for the lower limit for most people especially if the bathroom is cold	May be perceived as poor performance particularly in winter	Perceived by many as adequate	A 'good shower' by traditional UK standards	Maximum flow rate permitted in the USA	Might not be used at full flow
Plumbing system compatibility	Combi boiler and some thermostatic mixer valves unlikely to work at such a low flow rate	Fed from mains pressure cold water	Fed from mains pressure cold water	Mains pressure or pumped hot water. Some combi boilers might not work at this flow rate	Mains pressure hot water or pumped	
Water use for 5 minute shower	20	17.5	23.5	30 litres	47.5	60+

In U.S.A. the federal law establishes that the showers must be efficient, presenting a flow equal or inferior to 9,5 litres/min. In Australia, the classification system establishes a good performance (AAA) for devices with inferior or equal volume of 9 litres/min (0,15 litres/sec).<sup>51</sup>

Another important consideration for many buyers will be how a showerhead looks. Happily, water efficient shower heads are now available in a range of styles and need not look any different to a standard shower head. Showerheads can provide a gentle rain effect, an aerated champagne flow with almost no splashing, or a more invigorating massage effect with high skin pressure. Showerheads that create fine droplets can lead to cold feet since smaller water droplets cool quickly. Other showerheads can be quite noisy adding to the illusion of 'power' and flow. All this makes performance testing and recommendations difficult since user perceptions of what makes a good shower vary so widely.

Water use in showers depends on a number of factors:

Heating mechanism:

- Combination-boiler warm-up
- Pipe dead-leg (time for water to run hot)

Fixed / adjustable controls:

- Separate flow and temperature controls
- Stability of combination-boiler temperature control
- Stability of plumbing system pressures

Flow rate:

- Pressure and spray pattern influence perception of flow
- Small flow reductions may not be noticed
- Position of header tank/mains pressure/ pumped pressure

According to MTP the performance of a shower is defined by the following parameters:

- Flow rate (real and apparent)
- Area of coverage by the spray
- Force with which the spray acts on the user
- Effectiveness in washing away soap and shampoo

<sup>51</sup> Water saving devices – Euroconsumers technical report C17050, Decp Prteste, 2008

- Water temperature
- Controllability

The choice of mixer valve will also influence comfort and volume of water wasted during showering. Simple hot and cold tap controls mean both taps have to be adjusted with an infinite number of possible combinations in order to achieve the desired flow and temperature. As this must be done by feel, the valves will have to be adjusted as the hot water starts to reach the mixer. This presents an increased risk of scalding.

Thermostatic mixers usually have a calibrated dial, so the temperature can be set from experience. The flow is adjusted with a separate control so that reducing or interrupting the flow, for example to apply shampoo, is simple.

The Consumer Council for Water Annual Tracking survey 2009 indicates (for the UK) that the top actions taken by respondents to reduce water usage were:

- Taking showers instead of bath (33%)
- Turn off taps while brushing teeth (18%)
- Hippo /save a flush device for toilet (11%)

The survey also indicates that 70% of respondents claim to take specific measures to reduce their use of water, but there are still 30% who say that they don't do anything or don't know what they could do to reduce their use of water. These results are consistent with 2008 findings.

This indicates and supports the general trend of taking showers, and also the potential for increased savings through the use of showerheads that restrict water flow and by educating and influencing consumers and their behaviour.

It should be noted that no literature was identified during the research regarding the use behaviour within the non-domestic sector for taps and showerheads. However it should be noted that the product definition for this study is targeting taps and showerheads that are used in similar way in a non-domestic setting to that of a domestic setting. It could therefore be assumed that the behaviour within households is also applicable to the non-domestic sector.

Behaviour in non-domestic settings may, in part, be influenced by the types of taps used. For example sensor and push taps are used more widely in non domestic settings compared to domestic settings. Companies and organisations may also have training or information provided as part of a wider environmental management policy.

### **3.3.3 Repair and Maintenance Trends**

As identified in Section 2.4 above, a range of spare parts are available for taps and showerheads. However no information relating to repair and maintenance of these products during the use phase has been identified. This includes frequency and extent of repairs and whether they are DIY or by professional plumber.

It is anticipated that the majority of repair and maintenance activities will be done they are done in-situ as they will need to be done as soon as possible to ensure functionality is maintained.

It is possible to use flow restrictors on older taps that have a higher flow rate, but again to extent to which this is done is not known.

### **3.3.4 Product Lifetime**

It is important to understand what is the life cycle of the product to establish how new environmental or performance criteria will impact the replacement rate and how quickly can savings been achieved.

The life cycle presented here are average, it should be noted that these can be influenced by fashion, new technology or simply aesthetic.

In the UK the MTP<sup>52</sup> calculated the following life time:

- electric showers at 15 years in 2003,
- and for mixer showers at 16 years.
- The life expectancy of basin taps has been estimated at 15 years, in line with the overall estimated bathroom replacement rate.
- The life expectancy of kitchen taps has been estimated at 25 years, because kitchens are replaced less frequently than bathrooms.

The responses to the first questionnaire indicated the following range of lifetimes.

#### **Domestic premises**

- Taps kitchen: 5 to 20 years
- Taps bathroom: 5 to 20, but are designed to last more than 20 years (this seems to indicate the influence of fashion and improved technologies)
- Taps outdoor: 10 to 30 years
- Showerhead :5 to 15 years

#### **Non domestic:**

- All taps – 5 to 20 years
- Showerhead – 5 to 10 years

The lifetime values used for the modelling presented in section 2.2 are based on average value from the stakeholder's responses. These are summarised as follows:

- Domestic all taps: 16 years
- Domestic showerhead: 10 years
- Non-domestic all taps - 10 years
- Non-domestic showerhead – 7 years

### **3.3.5 Best Practice**

Information relating to best practice use of taps and showerheads has not been identified during this research.

It is clear from the above discussion regarding the use of taps and showers that practices vary and is highly dependent on individual user behaviour.

Where products feature water saving functions, for example economy setting on showerheads, there is no data to indicate the extent to which these settings are used or whether consumers use the most popular spray settings<sup>53</sup>.

As highlighted above, there is a range of information that can be provided to customers to influence how they use water; however data as to the extent that these practices are following has not been identified. For non domestic premises, specific sector advice may be provided, for example through programmes such as Envirowise or similar.

### **3.3.6 Issues around the type of water systems**

In continental Europe and America water supplies in the house are connected to the mains water supply (unvented systems) often giving a very high water pressure (in excess of 2 bar). Due to historical reasons, British water systems are generally connected to a water tank in the loft.

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<sup>52</sup> (Source MTP – BNDW Taps – Briefing note relating to projections of internal tap water consumption 2008 & BNDW Shower: Shower design and efficiency – Briefing Note relating to policy scenario objectives in policy brief).

<sup>53</sup> MTP BN DW Shower: Shower design and efficiency – Briefing Note relating to policy scenario objectives in Policy Brief



These are referred to as low pressure vented gravity systems relying on the height of the cold water storage tank in the loft to provide the pressure and water flow to the house. Given the restriction of the height of the tank, such houses have low pressure (often less than half a bar.)

Britain is the only Western country that routinely uses gravity systems. Consequently all research and development by tap and shower manufacturers concentrates on high water pressure systems leaving the British consumer "high and dry".

In addition, regarding showerheads there is a need to consider the type of hot water system that it is connected to. Indeed a too low flow rate might result in a system that does not start up to heat the water. This is especially true for gas based heated system. For example, 98% of households within the Netherlands have such system installed.

### **3.3.7 End-of-life behaviour**

Very little information has been identified on how taps and showerheads are handled at the end of life. The feedback gathered from the stakeholders through the questionnaire emphasises that due to the high market value of recovered metals, any taps and showerheads made of metals will be recycled in the vast majority of cases. It is less clear what happens to plastics product.

It is understood that any taps and showerheads that need to be disposed off, if handle by professionals (plumbers or builders) then it will be sent for recycling. However there is uncertainty of how much of these products are still recycled when it is a Do It Yourself (DIY) job undertaken by householders. It is believed that again a large proportion would be recycled, due to the ever increasing pressure on Public Authorities to recycle household waste and thus providing facilities where these products can be disposed of.

As previously highlighted, taps and showerheads are often changed before they fail, due to personal preferences and fashions. This raises the potential for a second hand market for taps and shower heads; however information regarding the extent of this across Europe has not been identified.

# Appendix 1 – Intra and Extra Trade Data

## 84 81 80 11 - MIXING VALVES FOR SINKS, WASHBASINS, BIDETS, WATER CISTERNS, BATHS AND SIMILAR FIXTURES

Table 1 Imports for 84 81 80 11 (in kg and Euro)

	IMPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total import (000)kg	EU27 EXTRA	EU27 INTRA	Total import million euro
EU-27	56,993	82,689	139,682	517	1,434	1,951
Austria	1,186	3,378	4,564	13	61	74
Belgium	3,035	3,723	6,758	29	81	109
Bulgaria	768	392	1,161	5	6	11
Cyprus	98	447	545	1	7	8
Czech Republic	725	1,845	2,570	7	29	36
Denmark	922	1,739	2,661	10	33	43
Estonia	90	421	511	1	7	8
Finland	87	1,242	1,328	1	26	27
France	4,096	17,190	21,286	47	305	351
Germany	17,890	20,403	38,292	194	307	501
Greece	694	3,782	4,476	5	40	45
Hungary	254	1,399	1,653	2	19	21
Ireland	113	975	1,088	1	11	12
Italy	5,111	5,608	10,719	42	96	137
Latvia	135	341	477	1	6	7
Lithuania	982	479	1,461	6	9	16
Luxembourg	0	264	264	0	9	9
Malta	54	173	227	0	2	3
Poland	5,134	2,649	7,783	38	44	82
Portugal	645	1,378	2,023	7	20	27
Romania	2,468	1,041	3,508	4	14	18
Slovakia	379	506	886	3	11	14
Slovenia	509	558	1,067	3	9	12
Spain	2,421	4,089	6,510	19	95	114
Sweden	624	1,412	2,036	7	22	28
The Netherlands	1,415	3,900	5,315	12	93	105
The United Kingdom	7,161	3,352	10,513	61	71	132

**Table 2 Imports expressed in percentages for 84 81 80 11**

The table presents the shares of Member States imports in the overall imports (intra EU27, extra EU27 and total [intra + extra]), i.e. looking at Austria, Austrian extra EU27 import represented 2.1% of all extra EU imports, while Austrian intra EU27 import represented 4.1% of all intra Europe imports. The overall Austrian share in extra and intra EU27 imports was 3.3%. This data allows us to identify which Member States are the dominant importers within the EU27.

	IMPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total import	EU27 EXTRA	EU27 INTRA	Total import
Austria	2.1%	4.1%	3.3%	2.5%	4.3%	3.8%
Belgium	5.3%	4.5%	4.8%	5.6%	5.6%	5.6%
Bulgaria	1.3%	0.5%	0.8%	0.9%	0.4%	0.6%
Cyprus	0.2%	0.5%	0.4%	0.1%	0.5%	0.4%
Czech Republic	1.3%	2.2%	1.8%	1.3%	2.0%	1.8%
Denmark	1.6%	2.1%	1.9%	2.0%	2.3%	2.2%
Estonia	0.2%	0.5%	0.4%	0.1%	0.5%	0.4%
Finland	0.2%	1.5%	1.0%	0.2%	1.8%	1.4%
France	7.2%	20.8%	15.2%	9.0%	21.3%	18.0%
Germany	31.4%	24.7%	27.4%	37.4%	21.4%	25.7%
Greece	1.2%	4.6%	3.2%	1.0%	2.8%	2.3%
Hungary	0.4%	1.7%	1.2%	0.3%	1.3%	1.1%
Ireland	0.2%	1.2%	0.8%	0.3%	0.7%	0.6%
Italy	9.0%	6.8%	7.7%	8.1%	6.7%	7.0%
Latvia	0.2%	0.4%	0.3%	0.2%	0.4%	0.3%
Lithuania	1.7%	0.6%	1.0%	1.2%	0.6%	0.8%
Luxembourg	0.0%	0.3%	0.2%	0.0%	0.7%	0.5%
Malta	0.1%	0.2%	0.2%	0.1%	0.2%	0.1%
Poland	9.0%	3.2%	5.6%	7.4%	3.1%	4.2%
Portugal	1.1%	1.7%	1.4%	1.3%	1.4%	1.4%
Romania	4.3%	1.3%	2.5%	0.8%	1.0%	0.9%
Slovakia	0.7%	0.6%	0.6%	0.6%	0.7%	0.7%
Slovenia	0.9%	0.7%	0.8%	0.5%	0.7%	0.6%
Spain	4.2%	4.9%	4.7%	3.7%	6.6%	5.9%
Sweden	1.1%	1.7%	1.5%	1.3%	1.5%	1.5%
The Netherlands	2.5%	4.7%	3.8%	2.3%	6.5%	5.4%
The United Kingdom	12.6%	4.1%	7.5%	11.8%	5.0%	6.8%

**Table 3 Exports for 84 81 80 11 (in kg and Euro)**

	EXPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total export (000)kg	EU27 EXTRA	EU27 INTRA	total export Million euro
EU-27	37,970	89,160	127,130	753	1,588	2,341
Austria	720	3,272	3,992	9	44	53
Belgium	96	3,174	3,270	1	35	35
Bulgaria	2,302	5,916	8,218	38	72	111
Cyprus	0	5	5	0	0	0
Czech Republic	297	2,436	2,733	4	14	18
Denmark	1,610	1,244	2,854	34	41	75
Estonia	75	38	113	2	1	2
Finland	786	1,067	1,853	20	27	47
France	889	1,826	2,715	14	41	55
Germany	14,558	23,713	38,271	373	552	925
Greece	190	326	516	3	3	6
Hungary	543	216	758	8	3	11
Ireland	22	3	25	0	0	0
Italy	7,956	23,778	31,735	130	413	543
Latvia	14	5	19	0	0	0
Lithuania	640	101	741	6	1	7
Luxembourg	0	10	10	0	0	0
Malta	0	0	0	0	0	0
Poland	812	1,951	2,764	10	29	39
Portugal	424	12,598	13,023	5	191	196
Romania	4	1	5	0	0	0
Slovakia	0	128	128	0	2	2
Slovenia	1,252	1,244	2,496	17	13	31
Spain	2,346	3,163	5,509	33	53	86
Sweden	1,213	1,771	2,984	28	30	58
The Netherlands	74	556	630	2	6	7
The United Kingdom	1,147	620	1,767	16	17	33

**Table 4 Exports expressed in percentages for 84 81 80 11**

The table presents the shares of each Member States export in overall EU27 exports (intra EU27, extra EU27 and total). This data allows us to identify which Member States are the dominant exporters within the EU27.

	EXPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total export	EU27 EXTRA	EU27 INTRA	total export
Austria	1.9%	3.7%	3.1%	1.2%	2.8%	2.3%
Belgium	0.3%	3.6%	2.6%	0.1%	2.2%	1.5%
Bulgaria	6.1%	6.6%	6.5%	5.1%	4.6%	4.7%
Cyprus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Czech Republic	0.8%	2.7%	2.1%	0.5%	0.9%	0.8%
Denmark	4.2%	1.4%	2.2%	4.5%	2.6%	3.2%
Estonia	0.2%	0.0%	0.1%	0.2%	0.0%	0.1%
Finland	2.1%	1.2%	1.5%	2.6%	1.7%	2.0%
France	2.3%	2.0%	2.1%	1.9%	2.6%	2.4%
Germany	38.3%	26.6%	30.1%	49.6%	34.7%	39.5%
Greece	0.5%	0.4%	0.4%	0.4%	0.2%	0.2%
Hungary	1.4%	0.2%	0.6%	1.0%	0.2%	0.5%
Ireland	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Italy	21.0%	26.7%	25.0%	17.3%	26.0%	23.2%
Latvia	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Lithuania	1.7%	0.1%	0.6%	0.8%	0.1%	0.3%
Luxembourg	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Malta	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Poland	2.1%	2.2%	2.2%	1.3%	1.8%	1.7%
Portugal	1.1%	14.1%	10.2%	0.7%	12.1%	8.4%
Romania	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Slovakia	0.0%	0.1%	0.1%	0.0%	0.1%	0.1%
Slovenia	3.3%	1.4%	2.0%	2.3%	0.8%	1.3%
Spain	6.2%	3.5%	4.3%	4.4%	3.3%	3.7%
Sweden	3.2%	2.0%	2.3%	3.7%	1.9%	2.5%
The Netherlands	0.2%	0.6%	0.5%	0.2%	0.4%	0.3%
The United Kingdom	3.0%	0.7%	1.4%	2.2%	1.1%	1.4%

**84 81 80 19 TAPS, COCKS AND VALVES FOR SINKS, WASHBASINS, BIDETS, WATER CISTERNS, BATHS AND SIMILAR FIXTURES (EXCL. MIXING VALVES)**

**Table 5 Imports 84 81 80 19 (in kg and Euro)**

	IMPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total import (000)kg	EU27 EXTRA	EU27 INTRA	Total import million euro
EU-27	38,351	38,103	76,453	321	500	821
Austria	191	1,810	2,000	2	28	30
Belgium	502	2,035	2,537	5	29	33
Bulgaria	338	262	600	2	2	4
Cyprus	54	105	160	0	1	2
Czech Republic	337	607	944	3	11	13
Denmark	195	777	972	2	18	19
Estonia	34	205	239	0	1	1
Finland	73	148	221	1	4	5
France	2,429	3,433	5,862	16	41	57
Germany	4,769	5,037	9,807	51	58	109
Greece	963	1,783	2,746	6	20	26
Hungary	109	615	724	1	6	7
Ireland	539	1,524	2,064	4	12	16
Italy	7,415	1,605	9,021	55	36	91
Latvia	13	100	113	0	1	1
Lithuania	135	394	529	1	3	4
Luxembourg	6	156	162	0	4	4
Malta	99	51	151	0	1	1
Poland	1,070	920	1,990	7	15	22
Portugal	214	858	1,071	2	10	12
Romania	751	1,015	1,766	3	13	16
Slovakia	526	539	1,064	2	7	9
Slovenia	260	325	585	2	4	5
Spain	4,199	3,656	7,856	31	55	86
Sweden	359	1,853	2,212	4	11	15
The Netherlands	609	2,301	2,910	6	16	22
The United Kingdom	12,163	5,989	18,151	116	93	209

**Table 6 Imports expressed in percentages for 84 81 80 19**

The table presents the shares of each Member States import in overall EU 27 imports (intra EU27, extra EU27 and total). This data allows us to identify which Member States are the dominant importers within the EU27.

	IMPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total import	EU27 EXTRA	EU27 INTRA	Total import
Austria	0.5%	4.7%	2.6%	0.6%	5.7%	3.7%
Belgium	1.3%	5.3%	3.3%	1.4%	5.8%	4.1%
Bulgaria	0.9%	0.7%	0.8%	0.5%	0.5%	0.5%
Cyprus	0.1%	0.3%	0.2%	0.1%	0.3%	0.2%
Czech Republic	0.9%	1.6%	1.2%	0.8%	2.1%	1.6%
Denmark	0.5%	2.0%	1.3%	0.5%	3.6%	2.4%
Estonia	0.1%	0.5%	0.3%	0.1%	0.2%	0.2%
Finland	0.2%	0.4%	0.3%	0.3%	0.8%	0.6%
France	6.3%	9.0%	7.7%	5.1%	8.2%	7.0%
Germany	12.4%	13.2%	12.8%	15.9%	11.5%	13.2%
Greece	2.5%	4.7%	3.6%	1.8%	4.0%	3.1%
Hungary	0.3%	1.6%	0.9%	0.2%	1.3%	0.8%
Ireland	1.4%	4.0%	2.7%	1.2%	2.4%	1.9%
Italy	19.3%	4.2%	11.8%	17.2%	7.2%	11.1%
Latvia	0.0%	0.3%	0.1%	0.0%	0.2%	0.2%
Lithuania	0.4%	1.0%	0.7%	0.2%	0.7%	0.5%
Luxembourg	0.0%	0.4%	0.2%	0.0%	0.7%	0.5%
Malta	0.3%	0.1%	0.2%	0.1%	0.2%	0.1%
Poland	2.8%	2.4%	2.6%	2.3%	3.0%	2.7%
Portugal	0.6%	2.3%	1.4%	0.5%	2.0%	1.4%
Romania	2.0%	2.7%	2.3%	0.9%	2.5%	1.9%
Slovakia	1.4%	1.4%	1.4%	0.5%	1.5%	1.1%
Slovenia	0.7%	0.9%	0.8%	0.5%	0.7%	0.6%
Spain	10.9%	9.6%	10.3%	9.8%	11.0%	10.5%
Sweden	0.9%	4.9%	2.9%	1.2%	2.3%	1.8%
The Netherlands	1.6%	6.0%	3.8%	1.8%	3.2%	2.6%
The United Kingdom	31.7%	15.7%	23.7%	36.3%	18.6%	25.5%

**Table 7 Exports for 84 81 80 19 (in kg and Euro)**

	EXPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total export (000)kg	EU27 EXTRA	EU27 INTRA	total export Million euro
EU-27	22,168.0	22,366.6	44,534.6	325.8	380.8	706.6
Austria	141.3	371.1	512.4	1.8	5.5	7.3
Belgium	52.8	569.9	622.7	1.3	6.0	7.3
Bulgaria	8.1	2.4	10.5	0.1	0.0	0.1
Cyprus	0.2	0.3	0.5	0.0	0.0	0.0
Czech Republic	419.6	233.6	653.2	4.6	3.3	7.9
Denmark	241.3	713.1	954.4	7.4	22.0	29.4
Estonia	4.2	19.0	23.2	0.1	0.8	0.9
Finland	55.7	35.9	91.6	3.3	1.2	4.4
France	1,268.1	775.2	2,043.3	38.9	29.0	68.0
Germany	3,394.2	6,007.1	9,401.3	64.1	133.9	198.0
Greece	85.1	128.4	213.5	0.7	0.7	1.4
Hungary	10.1	84.4	94.5	0.5	1.3	1.8
Ireland	0.0	170.4	170.4	0.0	1.3	1.3
Italy	11,097.4	6,510.3	17,607.7	144.6	93.9	238.5
Latvia	20.1	1.7	21.8	0.2	0.0	0.3
Lithuania	101.3	567.6	668.9	1.7	14.1	15.8
Luxembourg	0.1	13.2	13.3	0.0	0.2	0.3
Malta	0.1	85.4	85.5	0.0	0.5	0.5
Poland	348.0	284.0	632.0	4.9	3.0	7.9
Portugal	878.8	1,254.7	2,133.5	6.6	16.2	22.8
Romania	67.2	82.1	149.3	0.6	0.5	1.1
Slovakia	34.1	22.0	56.1	0.2	0.5	0.7
Slovenia	483.4	1,214.8	1,698.2	5.2	11.7	16.8
Spain	2,389.4	1,504.3	3,893.7	21.3	17.8	39.0
Sweden	17.4	10.3	27.7	0.5	0.5	1.1
The Netherlands	144.8	96.4	241.2	4.9	1.5	6.4
The United Kingdom	905.2	1,609.0	2,514.2	12.5	15.2	27.7



**Table 8 Exports expressed in percentages for 84 81 80 19**

The table presents the shares of each Member States exports in overall EU27 exports (intra EU27, extra EU27 and total). This data allows us to identify which Member States are the dominant exporters within the EU27.

	EXPORTS					
	THOUSAND KG			MILLION euro		
	EU27 EXTRA	EU27 INTRA	total export	EU27 EXTRA	EU27 INTRA	total export
Austria	0.6%	1.7%	1.2%	0.5%	1.5%	1.0%
Belgium	0.2%	2.5%	1.4%	0.4%	1.6%	1.0%
Bulgaria	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cyprus	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Czech Republic	1.9%	1.0%	1.5%	1.4%	0.9%	1.1%
Denmark	1.1%	3.2%	2.1%	2.3%	5.8%	4.2%
Estonia	0.0%	0.1%	0.1%	0.0%	0.2%	0.1%
Finland	0.3%	0.2%	0.2%	1.0%	0.3%	0.6%
France	5.7%	3.5%	4.6%	11.9%	7.6%	9.6%
Germany	15.3%	26.9%	21.1%	19.7%	35.2%	28.0%
Greece	0.4%	0.6%	0.5%	0.2%	0.2%	0.2%
Hungary	0.0%	0.4%	0.2%	0.1%	0.3%	0.2%
Ireland	0.0%	0.8%	0.4%	0.0%	0.3%	0.2%
Italy	50.1%	29.1%	39.5%	44.4%	24.7%	33.8%
Latvia	0.1%	0.0%	0.0%	0.1%	0.0%	0.0%
Lithuania	0.5%	2.5%	1.5%	0.5%	3.7%	2.2%
Luxembourg	0.0%	0.1%	0.0%	0.0%	0.1%	0.0%
Malta	0.0%	0.4%	0.2%	0.0%	0.1%	0.1%
Poland	1.6%	1.3%	1.4%	1.5%	0.8%	1.1%
Portugal	4.0%	5.6%	4.8%	2.0%	4.3%	3.2%
Romania	0.3%	0.4%	0.3%	0.2%	0.1%	0.1%
Slovakia	0.2%	0.1%	0.1%	0.1%	0.1%	0.1%
Slovenia	2.2%	5.4%	3.8%	1.6%	3.1%	2.4%
Spain	10.8%	6.7%	8.7%	6.5%	4.7%	5.5%
Sweden	0.1%	0.0%	0.1%	0.2%	0.1%	0.1%
The Netherlands	0.7%	0.4%	0.5%	1.5%	0.4%	0.9%
The United Kingdom	4.1%	7.2%	5.6%	3.8%	4.0%	3.9%