Green Procurement - Sanitary Tapware

February 2018

Introduction

Green Public Procurement (GPP) is a voluntary instrument, which basic concept relies on "having clear, verifiable, justifiable and ambitious environmental criteria for products and services, based on a lifecycle approach and scientific evidence base"[1].

The European Commission has presented so far several sets of recommended GPP criteria for a range of different products and services, which are available at the especially dedicated website. http://ec.europa.eu/environment/gpp/index_en.htm

In 2013, the Joint Research Centre (JRC), Institute for Prospective Technical Studies (IPTS), provided a Technical Background Report for the European Commission, which substantiates the proposal of GPP criteria developed for sanitary tapware. It contains also background information on the environmental impacts of sanitary tapware and describes the most important European legislation and labelling schemes relevant for this product group.

Key Environmental impacts - assessed by LCA tool *EcoReport*

The environmental performance of sanitary tapware was assessed by applying the *EcoReport* LCA tool. LCA (= Life Cycle Assessment) tools show various potential environmental impacts directly or indirectly to the product life cycle. In *EcoReport,* which is a streamlined LCA tool, all the life cycle phases of the product from cradle to grave including raw material extraction, production, distribution, use phase, recycling and disposal phase are analysed[2].

For the purpose of the project typical average products (base-cases) were identified

- two example taps, one made mainly of brass and the other of stainless steel
- two example showerheads, one mainly of plastic and the other of metal

and investigated in line with the methodology followed in the Ecodesign studies. Stakeholders, including the European Committee for the Valve Industry (CEIR), were consulted and supported the project team in the determination of these four base-cases.

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In this environmental assessment the focus was put on identifying which product life phases (i.e. production, distribution, use or end of life phase) contribute most to the overall environmental impacts of sanitary tapware and which are the most relevant environmental aspects.

The entire analysis and detailed results can be found in the base-case assessment report (available at the product website[3]). In this report also all the necessary assumptions, which were made regarding setting the system boundaries and estimating the user behaviour, are given. Main points of analysis and its outcomes are summarized below.

Information sources

For each life cycle phase information was collected from available sources, e.g. existing studies, reports and stakeholders` feedback. The *EcoReport* tool was applied with input data for two taps and two showerheads base-cases, provided by the European Committee for the Valve Industry (CEIR), in order to conduct the environmental assessment.

Two main resources consumed along the life cycle of taps and showerheads are water and energy. Their consumption constituted input into the *EcoReport* tool.

The calculation of water and energy consumption in the use phase strongly depends on user behaviour. A number of assumptions had to be made in order to estimate the average typical user behaviour and to calculate the average water and hot water consumption, taking into account the variability across various EU Member States. (The investigation of the influence of end-users was conducted in the framework of user behaviour analysis[4])

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[1] http://ec.europa.eu/environment/gpp/index_en.htm

[2] A detailed analysis and results interpretation of the results of environmental assessment of sanitary tapware products was conducted in the frame of the project´s task Base-case assessment. The following section constitutes a part of this report. The complete report is available on the project´s website: http://susproc.jrc.ec.europa.eu/ecotapware/whatsnew.html

[3] For details see Report: base-case assessment, chapter 2.3 and 3, available on: http://susproc.jrc.ec.europa.eu/ecotapware/whatsnew.html

[4] The results can be found in Report: Market and economic analysis & User behaviour, available on: http://susproc.jrc.ec.europa.eu/ecotapware/whatsnew.html

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Example 1: Brass tap

Parameter	Units	Production % of total	Distribution % of total	Use % of total	End of Life % of total	Total % of total
Total Energy (GER)	MJ	0.06 %	0.07 %	**99.86 %**	0.01 %	100.00 %
of which electricity (in primary MJ)	MJ	0.01 %	0.00 %	**99.99 %**	0.00 %	100.00 %
Water (process)	ltr	0.00 %	0.00 %	**100.00 %**	0.00 %	100.00 %
Water (cooling)	ltr	0.01%	0.07 %	**99.99 %**	0.00 %	100.00 %
Waste, non-hazardous, landfill	g	2,79 %	0.05 %	**97.09 %**	0.07 %	100.00 %
Waste, hazardous / incinerated	g	0.05 %	0.05 %	**96.96 %**	2.90 %	100.00 %
Emissions (Air)						
Greenhouase Gases in GWP 100	kg CO2 eq.	0.08 %	0.13 %	**99.80 %**	0.00 %	100.00 %
Ozon Depletion, emissions	mg R-11 eq.					neg.
Acidification, emissions	g SO2 eq.	0.16 %	0.06 %	**99.78 %**	0.00 %	100.00 %
Volatile Organic Compounds (VOC)	g	0.00 %	0.00 %	**100.00 %**	0.00 %	100.00 %
Persistent Organic Pollutants (POP)	ng i-Teq	5.74 %	0.00 %	**94.26 %**	0.00 %	100.00 %
Heavy Metals	mg Ni eq.	5.37 %	0.18 %	**94.33 %**	0.12 %	100.00 %
PAHs	mg Ni eq.	1.63 %	1.63 %	**96.20 %**	0.00 %	100.00 %
Particulate Matter (PM, dust)	g	0.37 %	5.75 %	**91.84 %**	2.04 %	100.00 %
Emissions (Water)						
Heavy Metals	mg Hg/20	1.36 %	0.00 %	**98.64 %**	0.17 %	100.00 %
Eutrophication	g PO4	0.00 %	0.00 %	**100.00 %**	0.00 %	100.00 %
Persistent Organic Pollutants (POP)	ng i-Teq					neg.

Table 1: Percentage breakdown of impacts across life cycle phases for the different impact categories for a brass tap. Values have been rounded to whole numbers, and percentages to two decimal places. Therefore the values in each life cycle phase may not appear to add up to the total value, and small percentages may appear as 0.00 %.

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Example 1: Plastic showerhead

Parameter	Units	Production % of total	Distribution % of total	Use % of total	End of Life % of total	Total % of total
Total Energy (GER)	MJ	0.03 %	0.07 %	**99.89 %**	0.00 %	100.00 %
of which electricity (in primary MJ)	MJ	0.01 %	0.00 %	**99.99 %**	0.00 %	100.00 %
Water (process)	ltr	0.00 %	0.00 %	**100.00 %**	0.00 %	100.00 %
Water (cooling)	ltr	0.01%	0.00 %	**99.99 %**	0.00 %	100.00 %
Waste, non-hazardous, landfill	g	0.08 %	0.06 %	**99.86 %**	0.01 %	100.00 %
Waste, hazardous / incinerated	g	0.09 %	0.04 %	**92.00 %**	7.87 %	100.00 %
Emissions (Air)						
Greenhouase Gases in GWP 100	kg CO2 eq.	0.03 %	0.13 %	**99.85 %**	0.00 %	100.00 %
Ozon Depletion, emissions	mg R-11 eq.					neg.
Acidification, emissions	g SO2 eq.	0.03 %	0.06 %	**99.90 %**	0.00 %	100.00 %
Volatile Organic Compounds (VOC)	g	0.00 %	0.00 %	**97.06 %**	0.00 %	100.00 %
Persistent Organic Pollutants (POP)	ng i-Teq	0.17 %	0.00 %	**99.83 %**	0.00 %	100.00 %
Heavy Metals	mg Ni eq.	2.49 %	0.19 %	**97.13 %**	0.19 %	100.00 %
PAHs	mg Ni eq.	0.00 %	1.69 %	**98.31 %**	0.00 %	100.00 %
Particulate Matter (PM, dust)	g	0.19 %	5.77 %	**91.06 %**	2.98 %	100.00 %
Emissions (Water)						
Heavy Metals	mg Hg/20	0.17 %	0.00 %	**99.65 %**	0.17 %	100.00 %
Eutrophication	g PO4	0.00 %	0.00 %	**100.00 %**	0.00 %	100.00 %
Persistent Organic Pollutants (POP)	ng i-Teq					neg.

Table 2: Percentage breakdown of impacts across life cycle phases for the different impact categories for a plastic shower-head. Values have been rounded to whole numbers, and percentages to two decimal places. Therefore the values in each life cycle phase may not appear to add up to the total value, and small percentages may appear as 0.00 %.

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Environmental Impact Assessment - results

Taps

The analysis for taps (example / table 1) shows that all impact categories are dominated by the use phase and this is mainly related to the energy use associated with the heating of water, with the exception of process water, which is attributable to the direct consumption of water.

Showerheads

The analysis for showerheads (example / table 2) shows that all impact categories are dominated by the use phase and this is mainly related to the energy use associated with the heating of water, with the exception of process water, which is attributable to the direct consumption of water.

Summary

It is clear from the above analysis that the use phase is key, as there is not category where the use phase does not dominate. Table 1 (brass tap) and table 2 (plastic showerhead) clearly demonstrate this for the example products. The same trends are also shown in the data for stainless steel taps and metal showerheads.

Thus reducing the consumption of water (including hot water) via efficient products is the key priority in greener (public) procurement of sanitary tapware.

GROHE

Water saving products

We have developed a line of smart water-saving products that use less water but do not reduce the enjoyment of the experience. GROHE EcoJoy faucets, for example, use a flow-limiting mousseur to reduce water consumption from 10 liters per minute to just over five litres. But because GROHE EcoJoy faucets also have an aerator, the user experiences the same voluminous flow as that given by a regular faucet.

We also have infrared sensors built into faucets, so water flows only when hands are underneath the tap. And our toilets can come with concealed dual-flush cisterns or start/stop systems to minimise water usage.

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Energy saving technologies

In addition to water-saving features, we have also developed a line of energy-saving products. GROHE SilkMove ES, for example, saves energy by supplying cold water with the faucet lever in the middle position of the fitting. In this way it prevents unnecessary production of hot water and also helps to ensure that drawn water is never hotter than intended. Thanks to special cartridge features, such as high quality ceramic discs and Teflon® technology, the GROHE SilkMove ES also offers a uniquely smooth operation which results in a lifetime of effortless precision.

We also help save energy with advanced thermostats. For example, GROHE TurboStat technology provides the desired shower temperature in the fastest possible and most comfortable way. Firstly, this saves water and time since cold water inflow is diminished during the warm-up phase. In addition, due to the active control mechanism, GROHE TurboStat keeps the water temperature constant for the duration of the shower which prevents the need for undesired manual adjustments and therefore also saves energy and water.

An further key aspect of thermostats is the safety feature with antiscald protection.

Another smart, energy-saving idea is our GROHE PowerBox which uses the flow of in-pipe water to generate the electrical energy needed to run an infrared sensor. The sensor detects when hands are removed from the water flow and then instantly closes the faucet.

Longevity

We also take great care in maximizing the longevity of our products: the average lifetime of GROHE fittings is around 17 years. However, almost all faucet replacements are made because the user wants a more up-to-date looking faucet. That´s why our designs are timeless, not trendy, so customers can enjoy them for longer. To enjoy a long, reliable lifetime, we also give a five-year warranty on most products and even a 10-year warranty on all concealed parts. In addition, GROHE spare parts are available for at least 15 years. It all adds up to a longer usage lifetime and less waste.

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Building sustainability

Planners, architects and investors have a historic opportunity: to fully embrace sustainable architecture and shape the future for generations to come. It´s an opportunity already being seized by many, because buildings with “green” certifications such as LEED, DGNB and BREEAM not only have less impact on the environment, they are also more valuable since they cost less to operate and maintain. However, one of the easiest ways to build in long-term sustainability is to save energy and resources through correct product selection.

All green building certification methodologies underline the importance of water efficiency within buildings. Planners, architects and investors can insist on clearly specified flow rates of faucets and shower heads.

With our sustainability credentials, together with our proven resource-saving products such as the GROHE Eurosmart Cosmopolitan E, we are helping planners, architects and investors to gain green building accreditations such as DGNB, LEED and BREEAM.

When it comes to emphasising how resource-conscious a new building design is, nothing beats the notion of “no need - no flow” in sanitation areas. That´s precisely what the GROHE Eurosmart Cosmopolitan E provides. Thanks to infrared sensing, water flows through these faucets only if needed: when a hand is underneath the spout. Depending on the model, the mixer automatically turns off and saves water when the user removes his or her hands, for example when applying soap, or after a pre-set time. The easy-to-clean mixer body makes it ideal for a wide range of buildings, including hotels and restaurants, leisure and sports facilities, hospitals, clinics and schools. And the automated on-off will make new building design proposals that extra bit greener.

With intelligent sensor technology it is even possible to adjust the detection range or flow time according to your needs. Via a remote control it is also possible to monitor the total usage of the faucet and gain insight into the number of litres of water consumed.

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