

US Market Penetration Of WaterSense Shower Heads, Lavatory Faucets And Toilets



A GMP Research Industry Report commissioned by
Plumbing Manufacturers International (PMI)

July 2015



GMP Research
Global Solutions

GMP Research Inc. | 2999 River Vista Way | Mount Pleasant, SC 29466 USA | 843-884-9567 | www.gmpresearch.com

About Plumbing Manufacturers International (PMI)

Plumbing Manufacturers International is the voluntary, not-for-profit international industry association of manufacturers of plumbing products, serving as the Voice of the Plumbing Industry. Member companies produce about 90 percent of the nation's plumbing products. As part of its mission, PMI advocates for plumbing product performance and innovation contributing to water savings, sustainability, public health and safety, and consumer satisfaction. For more information on PMI or its conferences, contact the organization at 1921 Rohlwing Road, Unit G, Rolling Meadows, IL, 60008; tel.: 847-481-5500; fax: 847-481-5501. Visit our website at <http://www.safeplumbing.org>.

About GMP Research

GMP Research is a global full service market research and consulting firm located in Mount Pleasant, SC. GMP Research aims to provide leaders in manufacturing, distribution, commercial, public and social sectors, and legislators with facts and insights on which to base management and policy decisions.

GMP Research combines the disciplines of economics and management, employing the analytical tools of economics with the insights of business leaders. Our "micro-to-macro" methodology examines forces affecting business strategy and public policy. GMP Research's in-depth industry reports have covered more than 50 countries and various industries related to both the commercial and residential construction markets.

Current research focuses on the market trends in the commercial and residential construction markets, with special focus on the kitchen/bath industry, the HVAC-R industry and building materials industry.

GMP Research is led by Victor Post, trained as a corporate economist with a major in marketing management and market research. Mr. Post has successfully built business in the United States, Latin America, Europe and Asia. He has held executive positions with the Kohler Company, Gerber Plumbing, Briggs Industries, Nokia, Hewlett Packard and Digital Equipment. He spent 20 years living in Europe and is fluent in English, German, French and Spanish.

GMP Research works with a network of affiliated partners throughout the world. Our clients are the leaders of their industry and are at the forefront of technology and design.

Our mission is to supply our clients with the best market intelligence always. We go to great lengths to research the subject matter at hand, and then spend an equal amount of time validating our data, to ensure our clients are receiving the best possible market intelligence.

TABLE OF CONTENTS	Page
Executive Summary	4
Research Methodology	6
Key Findings	10
• Existing Home Inventory in the United States	10
• Existing Commercial Inventory in the United States	16
• US Installed base of Shower Heads, Lavatory Faucets and Toilets	18
• Market Penetration for Shower Heads, Lavatory Faucets and Toilets	26
Conclusions	34
Final Thoughts	35

EXECUTIVE SUMMARY

Despite the urgent need to save water, consumers and businesses in drought-stricken states have been slow to purchase and install the most water-efficient toilets, shower heads and lavatory faucets, according to this study, conducted by [GMP Research, Inc.](#), and commissioned by [Plumbing Manufacturers International \(PMI\)](#).

The study found that only 5.5 percent of California's 33.5 million installed residential and commercial toilets are high-efficiency toilets using 1.28 gallons per flush – the Environmental Protection Agency's WaterSense® standard for toilets evaluated to be 20 percent more water-efficient than other plumbing products meeting federal standards. Despite drought conditions in California, only 21.1 percent of lavatory faucets there meet the WaterSense standard of 1.5 gallons per minute (gpm) and 23.9 percent of shower heads meet the WaterSense standard of 2.0 gpm. The WaterSense program was introduced in 2006 to encourage the use of water-efficient plumbing products.

The study further found that, on average, 7.0 percent of toilets installed nationwide are WaterSense toilets, 25.4 percent of lavatory faucets are WaterSense certified and 28.7 percent of shower heads are WaterSense certified. New York, New Jersey and Pennsylvania have the highest WaterSense toilet installation rates (averaging 10.0 percent), and Alabama, Kentucky, Tennessee and Mississippi the lowest (averaging 5.1 percent). Texas has the highest WaterSense shower head installation rate (39.5 percent), and Arkansas the highest WaterSense lavatory faucet installation rate (35.1 percent). Connecticut has the lowest installation rates for both WaterSense lavatory faucets (12.7 percent) and WaterSense shower heads (13.6 percent).

“With droughts beginning to affect more regions of the U.S., now is the time to create stronger rebates and incentives for consumers and businesses to purchase and install WaterSense plumbing products,” said Barbara C. Higgins, PMI CEO and executive director, noting that up to 360 million gallons of water a day can be saved through stronger adoption of WaterSense products in California alone. “WaterSense products are widely available now, and can quickly help save water.”

PMI has been providing input to the California Energy Commission, the Department of Water Resources and the State Water Resources Control Board as they work to fulfill Governor Jerry Brown's executive order to develop a statewide rebate program providing monetary incentives for the purchase of water-efficient plumbing products.

“We also are reaching out to the governors of states impacted by drought to offer our point of view and assistance,” Higgins continued. “The future is now – a time when steps to sustain an ever-precious resource must be taken,” Higgins stated. “As good stewards of the environment, PMI wants everyone to know that using WaterSense plumbing products is an immediate action that can be taken to save water. There have been tremendous advancements in the technology and efficacy of plumbing products. Using WaterSense products is common sense. Start saving more water today.”

GMP Research reviewed the current housing and commercial property inventory in all 50 states, speaking with industry professionals, utilities, retailers, builders and distributors. GMP Research examined the housing characteristics of over 171,240 homes in all price ranges in 90 metropolitan areas to determine the number of bathrooms per home, and to determine the number of plumbing fixtures and fittings installed.

In addition, GMP Research examined the current inventory of commercial properties in the United States and, by using the requirements spelled out in the International Plumbing Code, estimated the number of installed plumbing fixtures and fittings in these properties.

The study revealed that almost two-thirds of the homes in the United States are equipped with the original fixtures that were installed when the house was built.

- 26.7% of the homes were equipped with toilets that consume 3.5 gallons or more per flush.
- 66.3% of the homes were equipped with toilets that consume 1.6 gallons per flush.
- 7.0% of the homes were equipped with WaterSense certified toilets, using 1.28 gallons per flush or less.

The following table gives a regional overview of the market penetration of the various types of lavatory faucets, shower heads and toilets installed in the United States:



US Region	States	Lavatory Faucets			Shower Heads			Toilets			
		> 2.2 GPM	2.2 GPM	WaterSense	> 2.5 GPM	2.5 GPM	WaterSense	5.0 gpf	3.5 gpf	1.6 gpf	WaterSense
New England	CT, MA, ME, NH, RI, VT	7.6%	74.6%	17.8%	9.1%	70.9%	20.0%	5.0%	20.0%	67.5%	7.50%
Middle Atlantic	NJ, NY, PA	9.4%	74.7%	15.9%	11.1%	70.9%	18.0%	5.5%	21.9%	62.6%	10.0%
South Atlantic	DC, DE, FL, GA, NC, SC, VA, WV	14.0%	58.2%	27.8%	12.8%	55.6%	31.6%	2.9%	19.4%	71.4%	6.3%
East North Central	IL, IN, MI, OH, WI	9.9%	69.2%	20.9%	10.3%	66.0%	23.7%	6.0%	35.4%	51.8%	6.8%
West North Central	IA, KS, MN, MO, ND, NE, SD	14.4%	60.4%	25.2%	11.3%	60.0%	28.7%	2.0%	10.8%	79.6%	7.6%
East South Central	AL, KY, MS, TN	11.4%	57.2%	31.4%	9.5%	55.7%	34.8%	5.3%	34.0%	54.6%	6.1%
West South Central	AR, LA, OK, TX	7.1%	59.6%	33.3%	5.4%	57.9%	36.7%	2.0%	18.5%	74.3%	5.2%
Mountain	AZ, CO, ID, MT, NM, NV, UT, WY	17.2%	51.5%	31.3%	14.7%	50.2%	35.1%	3.5%	14.0%	76.3%	6.2%
Pacific	AK, CA, HI, OR	10.8%	62.3%	26.9%	9.5%	60.0%	30.5%	3.5%	14.0%	76.3%	6.2%
USA	All 50 States	11.2%	63.4%	25.4%	10.7%	60.6%	28.7%	4.5%	22.2%	66.3%	7.0%

Sources: US Census Bureau, GMP Research field interviews

RESEARCH METHODOLOGY

During the months of March through June 2015, GMP Research reviewed the penetration rate of WaterSense certified products among the installed base of residential and commercial bathroom fixtures.

According to the US Census Bureau, there are 132.8 million homes in the United States. In addition, there are approximately 11.4 million commercial properties.

Commercial buildings include hotels, restaurants, schools, nursing homes, health care facilities, retail/wholesale establishments, government buildings, gas stations, passenger terminals, sport stadiums, shopping centers, office buildings, university buildings, museums, cinemas and performing arts facilities.

GMP Research first examined the number of homes and commercial properties per US state and then reviewed when the buildings were built.

GMP Research then examined the housing characteristics of 171,240 homes in all price ranges in 90 metropolitan areas to determine the average number of bathrooms and plumbing products per house.

For the commercial properties, GMP Research relied on statistical information provided by the US Census Bureau concerning the number of employees per commercial property and used the International Plumbing Code to approximate the number of plumbing fixtures and fittings for each type of commercial building.

In a next step, GMP Research interviewed the manufacturers of bathroom fixtures and fittings to determine the average life expectancy of shower heads, lavatory faucets and toilets, in order to determine the estimated replacement cycle for the products.

Through field interviews with plumbers in all 50 states, GMP Research determined on average the number of homes with original plumbing fixtures and fittings still installed, even though they technically were beyond the expected life expectancy of the product.

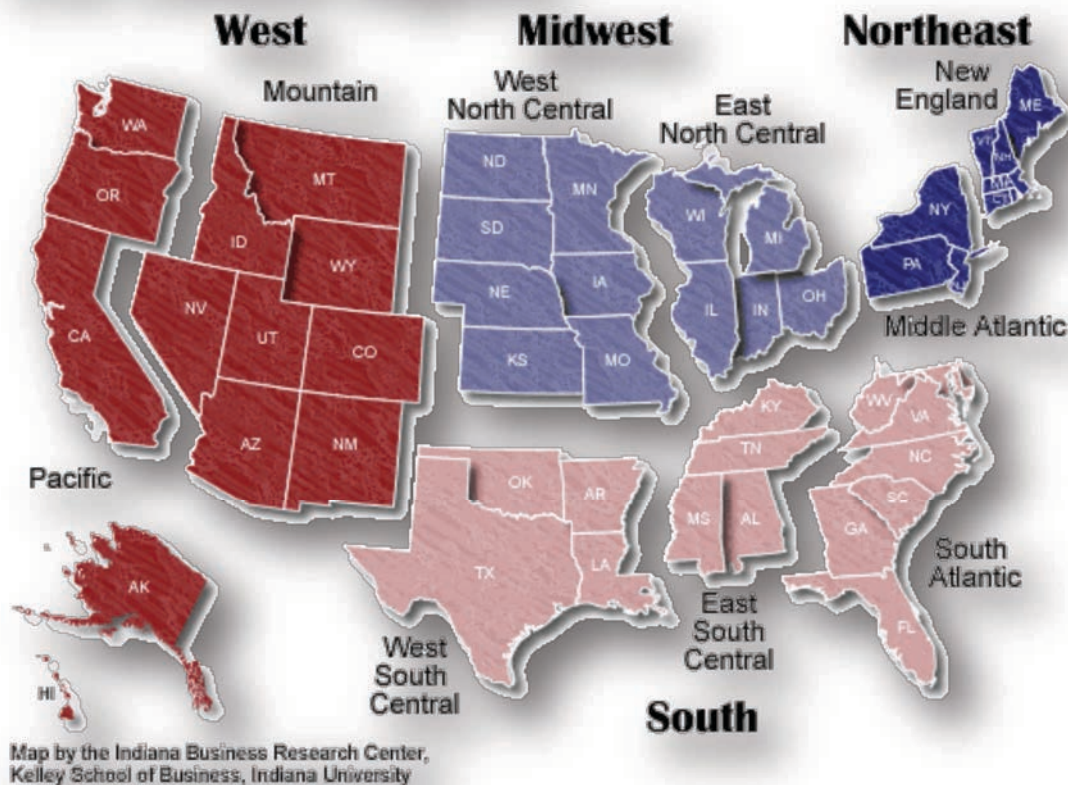
In a final step, GMP Research reviewed when federal legislation was enacted, determining when low flow and WaterSense products had to be installed with any new construction.

This led to a detailed assessment of the market penetration of WaterSense certified products installed in each of the 50 US states and cumulatively in the United States. While the study is based on certain product life expectancy assumptions, GMP Research interviewed several of the leading plumbing fixture and fittings manufacturers, as well as plumbers and property managers, to get as accurate a read as possible of the type of plumbing fixtures and fittings that are installed in the United States.

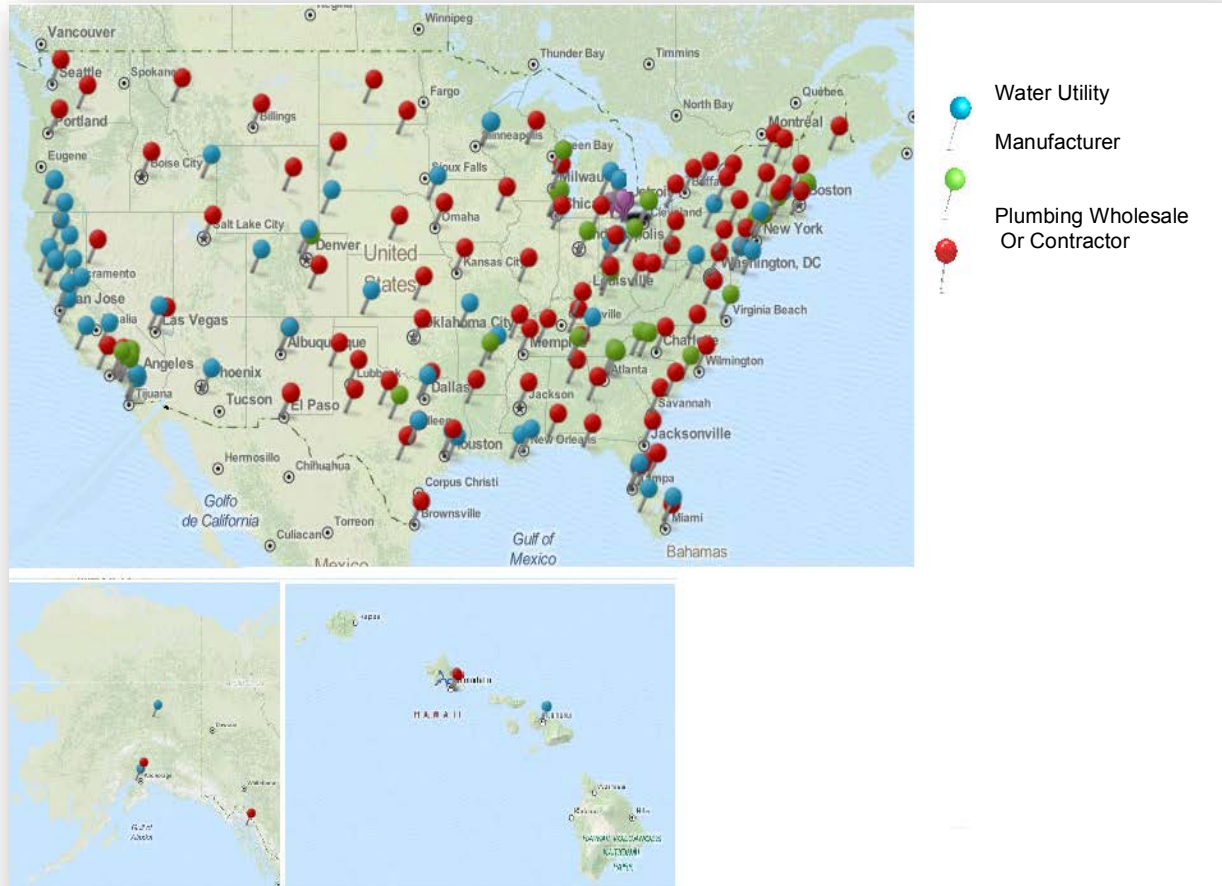
To ensure the research sample was representative of the demographics of the United States, interviews were conducted in all 50 US states. The research sample included 60 plumbing/fitting manufacturers, 165 plumbing wholesalers or contractors, and 115 water utilities.

The US Census segments the country into 9 US Census regions. We followed this approach to determine the regional market penetration of WaterSense products.

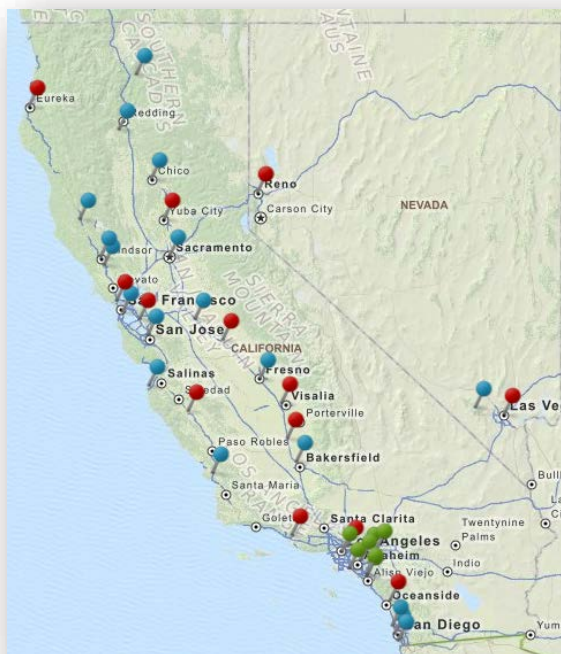
U.S. Census Regions



The following map gives an overview of the research sample for this study:



As the state of California is the most affected by the current drought, GMP Research conducted 17 interviews with regional water utilities, six manufacturers, and 11 major plumbing wholesalers in the state of California.



In California, water utilities were contacted in Anderson, Chico, Fresno, Imperial Beach, Los Angeles, McCloud City, Modesto, Monterey, Oceanside, Sacramento, San Diego, San Francisco, San Jose, San Luis Obispo, Santa Rosa, Ukiah, and Windsor.

KEY FINDINGS

Existing Home Inventory in the United States

According to the US Census, there are 132.8 million existing homes in the United States.

- 66.3% are single family homes
- 3.8% are duplex homes
- 4.5% are 3-4 unit town houses
- 4.9% are 5-9 unit apartment or condominium buildings
- 4.6% are 10-19 unit apartment or condominium buildings
- 8.6% are 20 or more unit apartment or condominium buildings
- 6.4% are mobile homes
- 0.9% are classified as other types of homes

On a regional basis, we see the following:

- 5.0% of the homes are in the New England region
- 13.2% of the homes are in the Middle Atlantic region
- 20.0% of the homes are in the South Atlantic region
- 15.5% of the homes are in the East North Central region
- 7.0% of the homes are in the West North Central region
- 6.3% of the homes are in the East South Central region
- 11.3% of the homes are in the West South Central region
- 7.4% of the homes are in the Mountain region
- 14.3% of the homes are in the Pacific region

The chart on the following page gives an overview of the total housing inventory in the United States by region and housing type.

US Housing Stock by Type of Home and by US Census Region

in million units – by dwelling type

Region	States	Single Family	Duplex	3-4 Unit Town House	5-9 Unit Apartment or Condominium Building	10-19 unit Apartment or Condominium Building	20 or More Unit Apartment or Condominium Building	Mobile Home	Other	Total
		a	b	c	d	e	f	g	h	a+b+c+d+e+f+g
New England	CT, MA, ME, NH, RI, VT	3.251	0.584	0.712	0.550	0.441	0.615	0.301	0.178	6.642
Mid Atlantic	NJ, NY, PA	10.404	1.498	1.082	0.795	0.66	2.623	0.454	0.008	17.534
South Atlantic	DC, DE, FL, GA, MD, NC, SC, VA, WV	17.069	0.537	0.805	1.249	1.409	2.184	2.366	0.948	26.567
East North Central	IL, IN, OH, MI, WI	14.779	0.892	0.920	1.029	0.792	1.344	0.828	0.005	20.589
West North Central	IA, KS, MN, MO, ND, NE, SD	6.949	0.246	0.315	0.319	0.350	0.647	0.468	0.004	9.298
East South Central	AL, KY, MS, TN	5.909	0.225	0.277	0.375	0.274	0.285	1.02	0.003	8.368
West South Central	AR, LA, OK, TX	10.36	0.342	0.490	0.654	0.791	0.994	1.353	0.026	15.010
Mountain	AZ, CO, ID, MT, NM, NV, UT, WY	6.838	0.195	0.400	0.448	0.455	0.669	0.813	0.012	9.830
Pacific	AK, CA, HI, OR, WA	12.444	0.496	0.987	1.101	0.978	2.105	0.879	0.005	18.995
USA		88.013	5.015	5.988	6.520	6.150	11.466	8.492	1.189	132.833
% of total		56.3%	3.8%	4.5%	4.9%	4.6%	8.6%	6.4%	0.9%	100.0%

Sources: US Census Bureau / American FactFinder

Number of Bedrooms and Bathrooms per House

The US Census Bureau provided insight into the number of bedrooms per home:

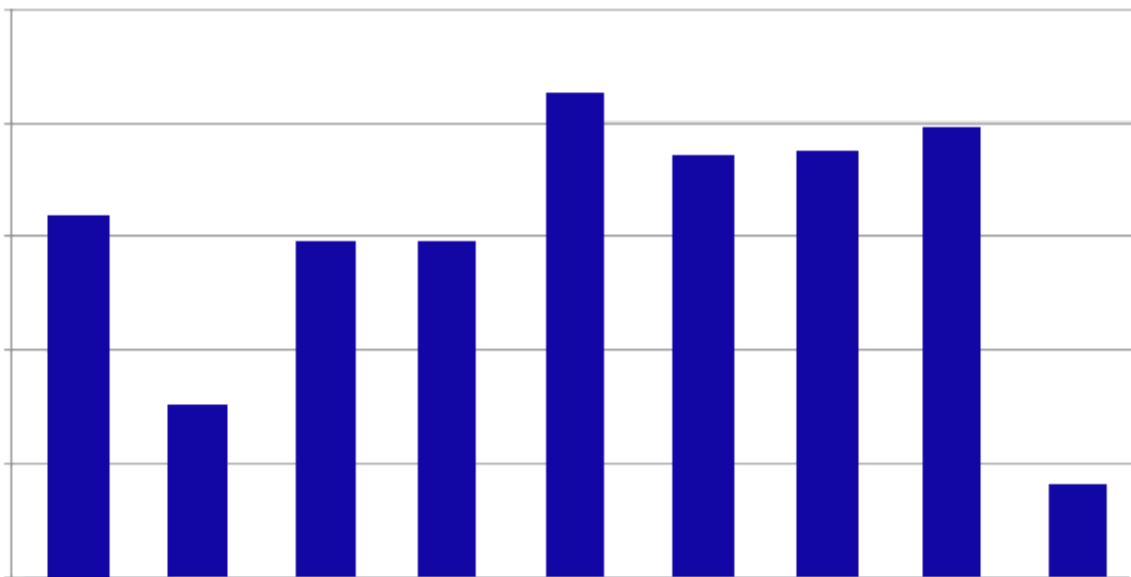
- 2.2% of the homes had no bedrooms
- 11.2% of the homes had one bedroom
- 26.7% of the homes had two bedrooms
- 39.7% of the homes had 3 bedrooms
- 16.0% of the homes had four bedrooms
- 4.2% of the homes had five or more bedrooms

Using this information, GMP Research reviewed a total of 171,240 homes in 90 metropolitan areas, covering all price points, to determine the average number of bathrooms per home:

- 36.4% of the homes had one bathroom
- 12.5% of the homes had 1-1/2 bathrooms
- 33.1% of the homes had two bathrooms
- 9.0% of the homes had three bathrooms
- 5.6% of the homes had four bathrooms
- 3.4% of the homes had five or more bathrooms

US Housing Stock by Age of Home

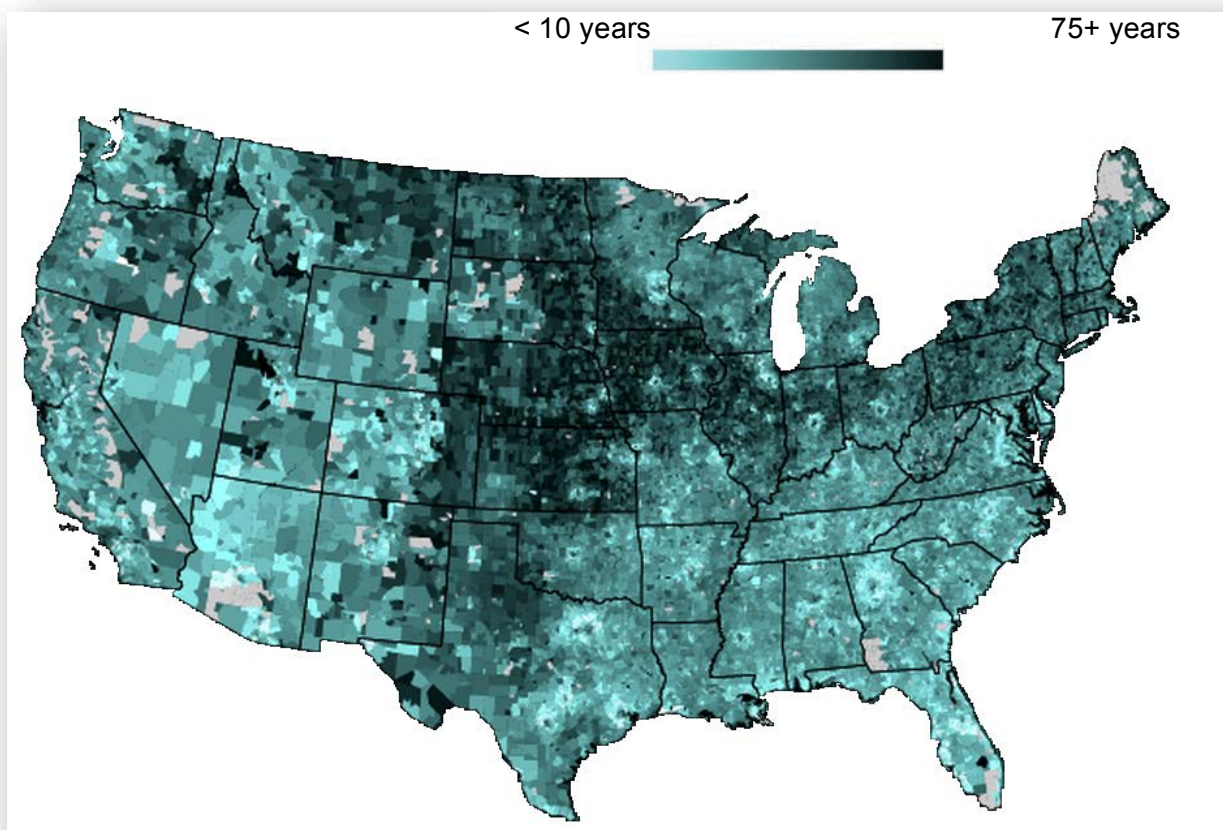
The following chart gives an overview of when the existing homes in the United States were built.



1939 or earlier	1940-49	1950-59	1960-69	1970-79	1980-89	1990-99	2000-09	2010 or later	Total
76 years or older	66-75 years	56-65 years	46-55 years	36-45 years	26-35 years	16-25 years	6-15 years	5 years or less	in Millions
15.760	7.118	14.398	14.566	20.931	18.250	18.409	19.867	3.534	132.833
11.9%	5.4%	10.8%	11.0%	15.7%	13.7%	13.8%	15.0%	2.7%	100.0%

Source: US Census Bureau

The following map gives an overview of the concentration of homes in the United States by age of the home:



Source: US Census Bureau / American Community Survey 5- year estimates / 2014

The table on the following page gives an overview of 30 US metropolitan areas with the largest share of housing units built before 1940.

The table is ranked according to the percentage of homes of the local housing inventory that were built before 1940.

US Metropolitan Areas with the Largest Share of Housing Units Constructed before 1940 (older than 74 years)

Rank	Metropolitan Area	Share of Housing Stock Built before 1940	Rank	Metropolitan Area	Share of Housing Stock Built before 1940
1	Boston, MA	35.7%	16	Baltimore, MD	14.4%
2	Providence, RI	33.1%	17	Portland, OR	13.1%
3	Buffalo, NY	30.5%	18	Columbus, OH	12.5%
4	New York, NY	28.9%	19	Louisville, KY	12.3%
5	Rochester, NY	28.8%	20	Indianapolis, IN	12.1%
6	Pittsburgh, PA	27.2%	21	Los Angeles, CA	12.0%
7	Milwaukee, WI	23.3%	22	Detroit, MI	12.0%
8	Cleveland, OH	22.7%	23	Kansas City, MO	11.9%
9	Chicago, IL	21.3%	24	New Orleans, LA	11.7%
10	Philadelphia, PA	21.2%	25	Seattle, WA	11.1%
11	San Francisco/Oakland, CA	20.4%	26	Richmond, VA	9.0%
12	Hartford, CT	19.3%	27	Salt Lake City, UT	8.9%
13	Cincinnati, OH	17.2%	28	Washington DC	8.6%
14	St. Louis, MO	15.8%	29	Denver, CO	7.1%
15	Minneapolis, MN	15.0%	30	Birmingham, AL	6.8%

Source: America's Oldest Cities | www.newgeography.com

Existing Commercial Inventory in the United States

According to the US Census, there are 11.361 million existing commercial buildings in the United States.

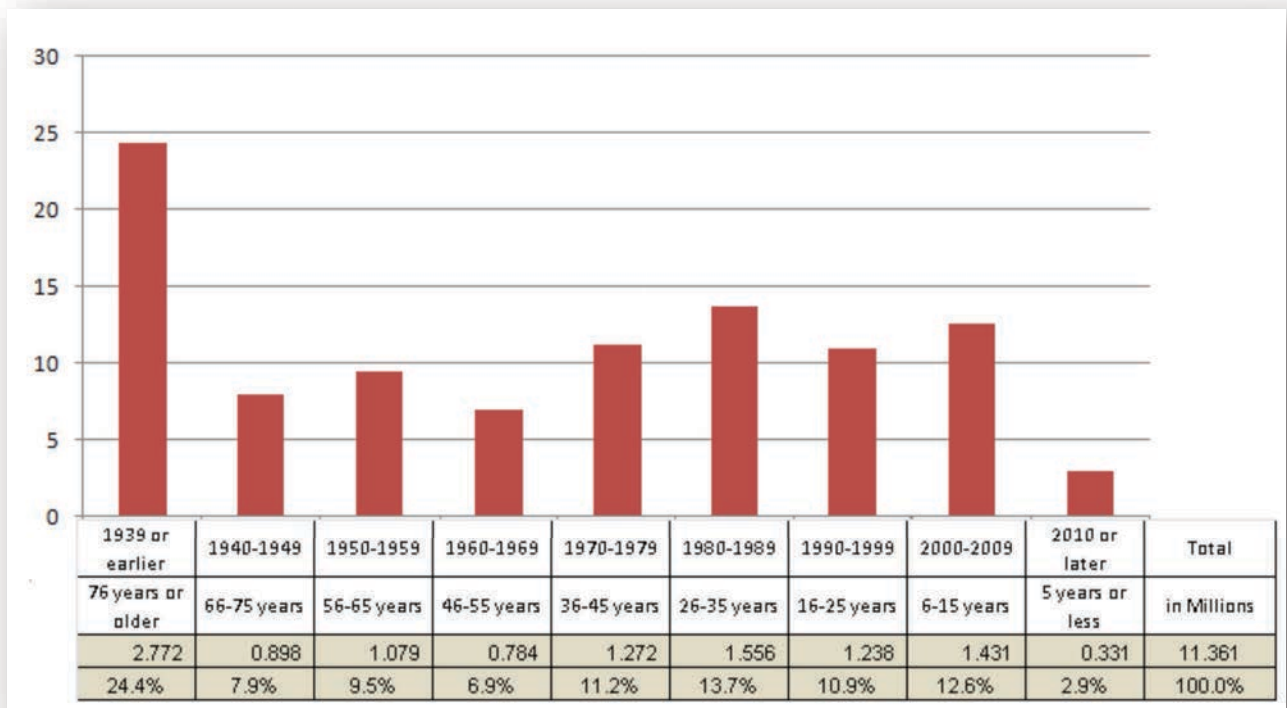
- 5,966 airports (international, large, midsize and small airports)
- 2,617 sports stadiums
- 5,053,400 office buildings
- 87,600 shopping centers
- 103,825 education and office buildings on a university campus
- 131,400 elementary and middle schools
- 37,100 public and private high schools
- 6,792 hospitals
- 56,880 nursing homes
- 495,450 other health care facilities
- 7,300 museums
- 39,600 cinemas
- 123,150 performing arts facilities
- 52,887 hotels
- 1,000,000 restaurants (full service, fast food, limited service restaurants)
- 1,624,600 retail/wholesale establishments
- 9,600 government buildings
- 43,750 gas stations
- 338,413 manufacturing facilities
- 2,140,670 commercial facilities classified as "other", which include utilities, EDP centers, Waste treatment facilities, leisure and entertainment facilities, military installations and penal institutes

On a regional basis, we see the following:

- 5.7% of the commercial properties are in the New England region
- 14.3% of the commercial properties are in the Middle Atlantic region
- 19.8% of the commercial properties are in the South Atlantic region
- 14.7% of the commercial properties are in the East North Central region
- 8.1% of the commercial properties are in the West North Central region
- 5.1% of the commercial properties are in the East South Central region
- 13.7% of the commercial properties are in the West South Central region
- 4.8% of the commercial properties are in the Mountain region
- 13.8% of the commercial properties are in the Pacific region

US Commercial Properties by Age of Property

The next chart provides an overview of when existing commercial properties in the United States were built. According to industry market studies conducted by GMP Research, approximately 4% of all plumbing products are sold into new commercial applications, while 6% of all plumbing products are sold as replacement products for commercial applications.



The table below gives the average age of commercial building by building type. This table indicates which industry sectors within the commercial non-residential building market have the greatest need for product replacements:

Average Age of Non-Residential Commercial Buildings by Building Type													
Building Type	Office	Lodging	Schools	Universities	Museums	Performing Arts	Cinemas	Shopping Malls	Retail /Wholesale	Hospitals	Restaurants	Stadiums	Airports
USA + Canada	44 years	38.5 years	53 years	63 Years	48 years	51 Years	34 years	43.5 years	56 years/ 34 years	45 years	41 years	42 years	29 years

Source: SMR Research, www.imt.org, US Census Bureau.

Source: US Census Bureau

US Installed Base of Toilets, Lavatory Faucets and Shower Heads

To arrive at the market penetration rates of WaterSense products, GMP Research measured the number of WaterSense products installed compared to the total installed base of toilets, lavatory faucets and shower heads.

To quantify the total number of toilets, lavatory faucets and shower heads installed, GMP Research made the following assumptions:

- According to industry market studies conducted by GMP Research, roughly 70% of the plumbing fixtures/fittings are sold as replacement items, while roughly 20% are sold into new residential construction and 10% are sold into commercial construction applications

- Plumbing fixtures and fittings per home

Number of Bathrooms per home	1	1 1/2	2	3	4	5	6	7
Lavatory Faucets per bathroom	1	2	4	5	6	7	9	10
Shower Heads per bathroom	1	1	2	3	4	5	6	6
Toilets per bathroom	1	2	2	3	4	5	6	7

- A shower head is replaced every 12.5 years
 - All shower heads installed prior to 1992 had flow rates greater than 2.5 gallons per minute. All shower heads installed from 1992 to 2006 had flow rates of 2.5 gallons per minute, as stipulated by the Energy Policy Act of 1992.
 - According to various faucet/shower head manufacturers, approximately 98% of all shower heads installed after 2006 were WaterSense-certified and had a flow rate of 2.0 gallons per minute.
- A lavatory faucet is replaced every 15 years
 - All lavatory faucets installed prior to 1992 had flow rates in excess of 2.2 gallons per minute. All lavatory faucets installed from 1992-2006 had flow rates of 2.2 gallons per minute as stipulated by the Energy Policy Act of 1992.
 - According to various faucet manufacturers, approximately 98% of all faucets installed after 2006 were WaterSense-certified and had a flow rate of 1.5 gallons per minute
- A toilet is replaced every 30 years
 - Research has revealed that some 60% of the homes are equipped with toilets originally installed when the house was built. Of these toilets, 22% will use 3.5 gallons per flush or more, while 38% will be use 1.6 gallons per flush.
 - All toilets installed prior to 1992 used 3.5 gallons or more per flush. Toilets installed from 1992 to 2006 used 1.6 gallons per flush, as stipulated by the Energy Policy Act of 1992. By January 1, 1994, all replacement residential toilets installed needed to comply with the Energy Policy Act of

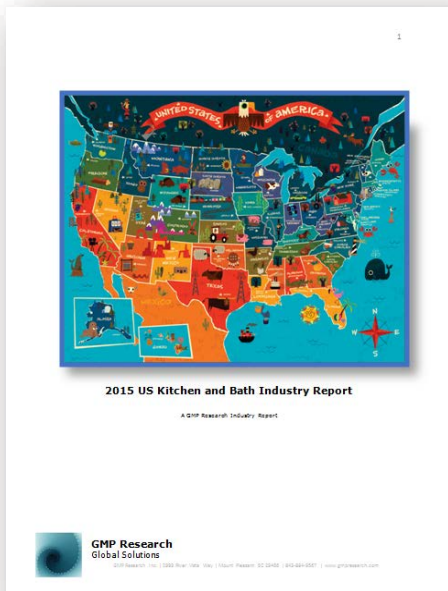
1992. By January 1, 1997, all newly installed commercial toilets needed to comply with the Energy Policy Act.

- WaterSense toilets were introduced in 2006. While installing WaterSense toilets is recommended, it is not mandated. The market continues to prefer 1.6 gallon per flush toilets over the 1.28 gallon per flush WaterSense products as consumers are seemingly more concerned with toilet performance than water savings and generally lack a clear understanding of the excellent performance of WaterSense toilets.
- According to plumbing manufacturers, WaterSense toilets represent approximately 30% of all new product sales in 2015.

The following table gives an overview of the installed shower heads, lavatory faucets and toilets installed in the 132.8 million homes:

	1	1 1/2	2	3	4	5	6	7	Total
Number of Bathrooms	44.167	20.783	43.973	11.955	7.439	0.225	0.212	4.079	132.833
Lavatory Faucets	44.167	41.566	175.892	59.775	44.634	1.575	1.908	40.790	410.307
Shower Heads	44.167	20.783	87.946	35.865	29.756	1.125	1.272	24.474	245.388
Toilets	44.167	41.566	87.946	35.865	29.756	1.125	1.272	28.553	270.250

Source: US Census Bureau, GMP Research



2015 US Kitchen and Bath Industry Report
Source: GMP Research Inc.

Every year GMP Research completes a detailed analysis of the US Kitchen/Bath Industry by product type. To complete these studies, GMP Research interviews all of the major manufacturers, distributors, retailers and contractors to learn about the market dynamics.

These reports specify the annual volume of toilets, lavatory faucets and shower heads sold in the United States since 1987 to present and highlight into which construction applications the products were sold.

The US Census Bureau supplied detailed information about the number of homes that were built from 1939 to present. From this, and from our analysis of the 171,240 homes in all price ranges in the ninety largest metropolitan areas, we were able to infer how many products were sold in the time period from 1939-1987.

Also from the US Census Bureau, GMP Research obtained the inventory count of all the commercial properties in the United States. The US Bureau of Economic Analysis provided insight into the non-residential construction expenditures per year dating back to 1939.

This allowed GMP Research to further fine tune its analysis of the market penetration for WaterSense products.

In a next step, GMP Research considered the "normal" replacement cycle for the products.

The replacement demand has a direct correlation to when the products were installed. A residential shower head will typically be replaced every 12.5 years. A lavatory faucet is replaced every 15 years and a toilet is replaced on average every 30 years.

The time of replacement is important, because it will, to a large extent, determine the market penetration of WaterSense products, which came on to the market after 2006.

This Old House

Let's consider a house that was built in 1939. By 2014, let's assume this house will have experienced several upgrades or had plumbing products replaced.



Source: www.realtor.com

By 2014, the shower heads will have been replaced at least five times.

The first replacement would have occurred around 1951, roughly 12.5 years after the initial shower head was installed.

The second shower head replacement would have been around 1964, 12.5 years after the second shower head had been installed.

The third replacement would have been in 1976.

The fourth replacement would have been in 1988.

The fifth replacement would have been in 2001.

Based on the time frame when new technology was introduced, assume the original shower head and the first three replacement units were designed around old technology and were using more than 2.5 gallons per minute.

In the case of our 1939 house, the last water guzzling shower head was replaced in 1989 - three years before the enactment of the Energy Act of 1992, which stipulated shower head had to a maximum of 2.5 gallons per minute. This shower head reached its theoretical "end-of-life" at around 2001 and, if replaced, was replaced with an Energy Act shower head that only used 2.5 gallons per minute.

In 2006 WaterSense products were introduced. The most current shower head in the 1939 house was replaced in 2001 - five years before the introduction of WaterSense products. Let's assume the shower head will be replaced at the end of its technical life span of 12.5 years - within the 2013-2014 time frame. As 98% of the shower heads currently being manufactured are WaterSense products, assume the shower head was replaced with a WaterSense product.

There are similar replacement scenarios for lavatory faucets and toilets.

According to plumbing manufacturers, lavatory faucets are replaced on average every 15 years. In the case of our 1939 house, by 2014, the lavatory faucets will have probably been replaced four times. The first replacement would have occurred around 1954. The second replacement would have taken place around 1969. The third replacement would have been around 1984. The fourth replacement would have occurred in the 1999-2000 time frame.

The current lavatory faucets would have been installed during the time frame when 2.2 gallons per minute water usage was mandated. These faucets are due to be replaced in 2015. According to various faucet manufacturers, 98% of the current faucet production is WaterSense products. Assume the current lavatory faucets installed in our 1939 house will be replaced with WaterSense lavatory faucets.

For toilets, manufacturers are suggesting an average life span of 30 years.

In our 1939 house example, this would mean the toilets probably have been replaced twice. The first replacement would have occurred around 1969, while the subsequent replacement would have taken place around 1999-2000.

Based on the available technology at the time, assume the original toilet consumed 5.0 gallons per flush. In 1969, those toilets were probably replaced with toilets that used 3.5 gallons per flush.

In the next wave of replacements, in 1999 or 2000, the 3.5 gallon per flush toilets were replaced with 1.6 gallon per flush toilets, as specified by the Energy Act of 1992.

By 2014, these 1.6 gpf toilets were still in use. Expect the home owner to use the 1.6 gpf toilets for the next 15 years, and to only replace them as needed, unless they receive a financial incentive from the community or water utility to replace them earlier.

The chart on the following page is an illustration of the theoretical replacement cycles for shower heads, lavatory faucets and toilets. These are the theoretical replacement cycles, as typically products are only replaced as needed.

Discussions with plumbing manufacturers and wholesale and plumbing contractors confirm our knowledge that products are replaced when they stop working, or when the home owner has decided to complete a home renovation project.

- Shower heads are replaced more frequently - mainly because the product performance starts to deteriorate from daily use. The replacement products are readily available and relatively easy for a home owner to install.
- Lavatory faucets are replaced a bit less frequently than a shower head. In the case of faucets, replacement is usually driven by design rather than functionality. The replacement products are readily available. The installation is, however, a bit more difficult. Some home owners choose to do the product swap out themselves, while others rely on the plumber. Faucets are usually replaced when a bathroom is either getting a face lift, or when it is totally being remodeled.
- Toilets are replaced infrequently. Usually they are replaced only if the product becomes defective, or it is replaced in the case of a bathroom remodel. While replacement products are readily available, most home owners choose to have a plumber or handyman install the products.

What Does This Imply?

According to the annual GMP Research Kitchen and Bath Industry Analysis, roughly 20% of the kitchen/bath products are sold into new residential construction, 10% are sold into commercial construction and 70% of the products are sold into the replacement market.

As illustrated in the example of our 1939 built house, the vast majority of the US housing inventory is entering into a product replacement phase for shower heads and lavatory faucets. When home owners replace products, they will likely select WaterSense products, resulting in significant future water savings.

In the case of toilets, the majority of existing homes in the United States have replaced their older toilets with 1.6 gpf toilets. There is, however, a considerable time lag expected before these 1.6 gpf toilets will be replaced with WaterSense products, which save roughly 20% more water than products meeting the higher federal standards.

Unless financial incentives are offered to home and business owners to replace their existing toilets with WaterSense products, we will continue to see WaterSense toilets having a low market penetration for years.

- **Shower Heads**

According to the research, there are 245.4 million shower heads installed in the US homes. During 2007-2014, our annual industry analysis indicates some 71.862 million shower heads were sold, of which 24% were sold into new residential construction and 76% were sold as replacements.

Based on inputs from the manufacturers, 98% of these 71.862 million shower heads sold were WaterSense products. This indicates the total amount of WaterSense shower heads was 70.4 million units.

Based on our assumptions of installation, there are 148.7 million shower heads that operate with a 2.5 gallon per minute flow rate and 26.2 million installed shower heads that are operating with a flow rate greater than 2.5 gallons per minute.

- **Lavatory Faucets**

According to the research, there are 410.3 million lavatory faucets installed in the US homes. During 2007-2014 a total of 106.343 million lavatory faucets were sold, of which 23.8% were sold into new construction and 76.2% were sold as replacement. 98% of these faucets were WaterSense lavatory faucets (104.2 million lavatory faucets).

Based on our installation assumptions there are 260.2 million faucets installed with a flow rate of 2.2 gallons per minute, and 45.913 million lavatory faucets with a flow rate greater than 2.2 gallons per minute.

- **Toilets**

According to the research, there are 270.3 million toilets installed in US homes. In addition, there are approximately 12.5 million residential toilets installed in the various light commercial applications (office buildings, hotel rooms, restaurants, nursing homes, retail/wholesale establishments, government buildings, gas stations and manufacturing).

The total amount of residential toilets installed is therefore:

270.3 million residential toilets installed in homes
+ 12.5 million residential toilets installed in light commercial applications
282.8 million residential toilets installed

During 2007-2014, a total of 19.842 million WaterSense toilets have been sold. Based on our assumptions of installation, there are 75.6 million toilets installed that require 3.5 gallons or more per flush and 187.3 million toilets which require 1.6 gallons per flush.


Not included in this calculation are the commercial toilets that require a flush valve. (Commercial spud bowls). These toilets are typically found in high traffic areas, such as airports, bus terminals, leisure and entertainment venues, health care facilities, and other commercial buildings. According to our field research, we believe an additional 45.6 million commercial spud-bowl toilets are installed throughout the United States.


On page 33 of this report, there is a table showing the types of toilets installed in the residential, light commercial and commercial applications.




Market Penetration for Shower Heads, Lavatory Faucets And Toilets

On a national level, we see the following market penetration of WaterSense products:


		Installed Base In Million Units	% of Installed Base
Shower Heads			
	> 2.5 gallons per minute	26.2	10.7%
	2.5 gallons per minute	148.7	60.6%
	2.0 gallons per minute	70.4	28.7%
Total		245.3	100.0%

		Installed Base In Million Units	% of Installed Base
Lavatory Faucets			
	> 2.2 gallons per minute	45.9	11.2%
	2.2 gallons per minute	260.2	63.4%
	1.5 gallons per minute	104.2	25.4%
Total		410.3	100.0%

		Installed Base In Million Units	% of Installed Base
Residential Toilets			
	3.5 gallons per flush or more	75.6	26.7%
	1.6 gallons per flush	187.3	66.3%
	1.28 gallons per flush or less	19.8	7.0%
Total		282.7	100.0%

Source: GMP Research field interviews with plumbing manufacturers, wholesalers, contractors and water utilities March-June 2015

Within the toilet category, we need to further examine the products by the flushing technology used within the toilet:

Total installed residential toilets in the United States			
	Gallons Per Flush	Residential Toilets	% of Total US Residential Toilets
Prior to Energy Policy Act of 1992	5.0 gpf	12,778,050	4.5%
	3.5 gpf	62,870,445	22.2%
Energy Policy Act of 1992	1.6 gpf	169,835,550	60.1%
	1.6 gpf pressure assist	17,434,775	6.2%
	1.28 gpf	10,525,820	3.7%
	1.28 gpf pressure assist	3,994,690	1.4%
	Dual Flush 1.6 / 1.28 gpf	5,323,665	1.9%
Total Residential Toilets		282,762,995	100.0%

Source: GMP Research field interviews with plumbing manufacturers, wholesalers, contractors and water utilities March-June 2015

Residential toilets have undergone significant technological advancements. With the introduction of the Energy Policy Act of 1992, toilets were redesigned to flush with 1.6 gallons per flush. Since 1992, toilet manufacturers have invested significantly to improve the effectiveness of toilets. New technology, advanced fluid dynamic modeling and modern manufacturing enable manufacturers to significantly boost performance of toilets without increasing water usage.

To meet the WaterSense requirements established in 2006, toilets must consume 20% less water while performing at the same level or higher as products meeting the 1992 Energy Policy Act. This means toilets are only allowed to use a maximum of 1.28 gallons per flush.

Regional Market Penetration of WaterSense Products

The following pages give detailed information concerning the market penetration of WaterSense lavatory faucets shower heads and toilets per US Census region and within the region per US State.

The regional market penetration information for the WaterSense toilets is listed subsequently. In addition to the regional market penetration, there is an overview of where residential and commercial toilets are installed.

The applications chart shows where market replacement action needs to be effectively implemented to gain the biggest overall water savings.

National Market Penetration Rates for WaterSense Lavatory Faucets and Shower Heads

USA



	Lavatory Faucets installed in the USA			Shower Heads installed in the USA		
	Flow Rate	Million Units	Lavatory Faucets	Flow Rate	Million Units	% of Total
Before Energy Policy Act of 1992 Installed base	> 2.2 GPM	45.913	11.2%	> 2.5 GPM	26.244	10.7%
Energy Policy Act of 1992 installed base	2.2 GPM	260.172	63.4%	2.5 GPM	148.718	60.6%
WaterSense Installed Base	1.5 GPM	104.216	25.4%	2.0 GPM	70.426	28.7%
Total Installed Base in Million Units		410.301	100.0%		245.388	100.0%

Regional Market Penetration Rates for WaterSense Lavatory Faucets and Shower Heads

in million units



New England

Mid Atlantic

Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
New England	CT	4.466	0.566	12.7%	3.344	74.9%	0.556	12.4%	2.671	0.362	13.6%	1.893	70.9%	0.416	15.6%
	MA	8.611	1.266	14.7%	6.653	77.3%	0.692	8.0%	5.150	0.859	16.7%	3.772	73.2%	0.519	10.1%
	ME	2.278	0.547	24.0%	1.640	72.0%	0.091	4.0%	1.362	0.371	27.2%	0.938	68.9%	0.053	3.9%
	NH	1.936	0.446	23.0%	1.375	71.0%	0.115	5.9%	1.158	0.303	26.2%	0.785	67.8%	0.070	6.0%
	RI	1.475	0.193	13.1%	1.243	84.3%	0.039	2.6%	0.882	0.130	14.7%	0.703	79.7%	0.049	5.6%
	VT	0.830	0.159	19.2%	0.567	68.3%	0.104	12.5%	0.496	0.108	21.8%	0.323	65.1%	0.065	13.1%
Mid Atlantic	NJ	11.114	1.956	17.6%	7.816	70.3%	1.342	12.1%	6.647	1.327	20.0%	4.447	66.9%	0.873	13.1%
	NY	22.638	3.351	14.8%	18.938	83.7%	0.349	1.5%	13.539	2.273	16.8%	10.726	79.2%	0.540	4.0%
	PA	18.190	2.774	15.3%	12.745	70.1%	2.671	14.7%	10.879	1.881	17.3%	7.236	66.5%	1.762	16.2%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

in million units



South Atlantic

Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
South Atlantic	DC	0.601	0.107	17.8%	0.423	70.4%	0.071	11.8%	0.359	0.073	20.3%	0.244	68.0%	0.042	11.7%
	DE	1.371	0.455	33.2%	0.663	48.4%	0.253	18.5%	0.820	0.309	37.7%	0.387	47.2%	0.124	15.1%
	FL	23.369	7.744	33.1%	13.527	57.9%	2.098	9.0%	13.976	5.247	37.5%	7.724	55.3%	1.005	7.2%
	GA	14.006	4.418	31.5%	7.179	51.3%	2.409	17.2%	8.377	3.001	35.8%	4.040	48.2%	1.336	15.9%
	MD	8.219	1.703	20.7%	4.865	59.2%	1.651	20.1%	4.916	1.155	23.5%	2.784	56.6%	0.977	19.9%
	NC	13.770	4.446	32.3%	7.871	57.2%	1.453	10.6%	8.235	3.012	36.6%	4.442	53.9%	0.781	9.5%
	SC	6.748	2.164	32.1%	3.808	56.4%	0.776	11.5%	4.036	1.468	36.4%	2.146	53.2%	0.422	10.5%
	VA	11.695	3.209	27.4%	6.376	54.5%	2.110	18.0%	6.994	2.176	31.1%	3.683	52.7%	1.135	16.2%
	WV	2.805	0.623	22.2%	1.926	68.7%	0.256	9.1%	1.678	0.422	25.1%	1.100	65.6%	0.156	9.3%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

in million units



East North Central

Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
East North Central	IL	15.804	3.210	20.3%	11.309	71.6%	1.285	8.1%	9.452	2.178	23.0%	6.447	68.2%	0.827	8.7%
	IN	8.556	2.090	24.4%	5.585	65.3%	0.881	10.3%	5.117	1.417	27.7%	3.202	62.6%	0.498	9.7%
	MI	14.393	2.522	17.5%	10.144	70.5%	1.727	12.0%	8.608	1.711	19.9%	5.771	67.0%	1.126	13.1%
	OH	15.949	2.898	18.2%	11.227	70.4%	1.824	11.4%	9.539	1.966	20.6%	6.391	67.0%	1.182	12.4%
	WI	7.904	1.908	24.1%	5.391	68.2%	0.605	7.7%	4.727	1.294	27.4%	3.086	65.3%	0.347	7.3%
West North Central	IA	4.104	0.956	23.3%	2.694	65.6%	0.454	11.1%	2.454	0.648	26.4%	1.543	62.9%	0.263	10.7%
	KS	3.861	0.822	21.3%	2.457	63.6%	0.582	15.1%	2.309	0.557	24.1%	1.405	60.8%	0.347	15.0%
	MN	7.885	1.833	23.2%	4.759	60.4%	1.293	16.4%	4.716	1.277	27.1%	2.703	57.3%	0.736	15.6%
	MO	8.823	2.244	25.4%	5.452	61.8%	1.127	12.8%	5.277	1.522	28.8%	3.132	59.4%	0.623	11.8%
	ND	1.280	0.397	31.0%	0.712	55.6%	0.171	13.4%	0.766	0.268	35.0%	0.413	53.9%	0.085	11.1%
	NE	2.634	0.592	22.5%	1.600	60.7%	0.442	16.8%	1.575	0.402	25.5%	0.917	58.2%	0.256	16.3%
	SD	1.306	0.388	29.7%	0.720	55.1%	0.198	15.2%	0.781	0.263	33.7%	0.417	53.4%	0.101	12.9%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

West North Central



in million units

East South Central

Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
East South Central	AL	7.249	2.251	31.1%	4.036	55.7%	0.962	13.3%	4.335	1.527	35.2%	2.339	54.0%	0.469	10.8%
	KY	5.701	1.628	28.6%	3.520	61.7%	0.553	9.7%	3.410	1.105	32.4%	2.029	59.5%	0.276	8.1%
	MS	4.233	1.404	33.2%	2.305	54.5%	0.524	12.4%	2.532	0.867	34.2%	1.363	53.8%	0.302	11.9%
	TN	9.062	2.976	32.8%	5.169	57.0%	0.917	10.1%	5.420	2.018	37.2%	2.999	55.3%	0.403	7.4%
West South Central	AR	3.902	1.369	35.1%	2.335	59.8%	0.198	5.1%	2.334	0.824	35.3%	1.399	59.9%	0.111	4.8%
	LA	6.054	1.993	32.9%	3.555	58.7%	0.506	8.4%	3.621	1.352	37.3%	2.062	56.9%	0.207	5.7%
	OK	5.153	1.549	30.1%	3.236	62.8%	0.368	7.1%	3.082	1.051	34.1%	1.866	60.5%	0.165	5.4%
	TX	30.634	10.686	34.9%	17.500	57.1%	2.448	8.0%	18.321	7.232	39.5%	9.950	54.3%	1.139	6.2%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

West South Central



in million units

Mountain

Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
Mountain	AZ	9.144	3.176	34.7%	5.094	55.7%	0.874	9.6%	5.469	2.152	39.3%	2.895	52.9%	0.422	7.7%
	CO	7.629	2.339	30.7%	3.961	51.9%	1.329	17.4%	4.563	1.586	34.8%	2.300	50.4%	0.677	14.8%
	ID	2.401	0.820	34.2%	1.051	43.8%	0.530	22.1%	1.436	0.499	34.7%	0.638	44.4%	0.299	20.8%
	MT	1.781	0.504	28.3%	0.972	54.6%	0.305	17.1%	1.065	0.342	32.1%	0.562	52.8%	0.161	15.1%
	NM	2.856	0.844	29.6%	1.734	60.7%	0.278	9.7%	1.708	0.572	33.5%	1.001	58.6%	0.135	7.9%
	NV	3.777	1.252	33.1%	2.182	57.8%	0.343	9.1%	2.259	0.850	37.6%	1.277	56.5%	0.132	5.8%
	UT	4.575	1.399	30.6%	1.605	35.1%	1.571	34.3%	2.736	0.949	34.7%	0.948	34.6%	0.839	30.7%
	WY	0.897	0.264	29.4%	0.476	53.1%	0.157	17.5%	0.535	0.181	33.8%	0.276	51.6%	0.078	14.6%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

in million units



Region	State	Total Lav Faucets Million Units	WaterSense Lav Faucets with 1.5 GPM Flow Rate		Low Flow Lav Faucets with 2.2 GPM Flow Rate		Other Lav Faucets with flow rates > 2.2 GPM		Total Shower Heads Million Units	Water Sense Shower Heads with 2.0 GPM Flow Rate		Low Flow Shower Heads with 2.5 GPM Flow Rate		Other Shower Heads with flow rates > 2.5 GPM	
			Million Units	%	Million Units	%	Million Units	%		Million Units	%	Million Units	%	Million Units	%
Pacific	AK	0.786	0.231	29.4%	0.504	64.1%	0.051	6.5%	0.470	0.157	33.4%	0.290	61.7%	0.023	4.9%
	CA	41.614	8.775	21.1%	28.325	68.1%	4.514	10.8%	24.888	5.949	23.9%	16.176	65.0%	2.763	11.1%
	HI	1.724	0.434	25.2%	1.033	59.9%	0.257	14.9%	1.031	0.294	28.5%	0.594	57.6%	0.143	13.9%
	OR	5.298	1.470	27.7%	3.305	62.4%	0.523	9.9%	3.169	0.997	31.5%	1.903	60.1%	0.269	8.5%
	WA	9.210	2.865	31.1%	5.265	57.2%	1.080	11.7%	5.508	1.942	35.3%	3.051	55.4%	0.515	9.4%
USA TOTAL	USA	410.301	104.216	25.4%	260.172	63.4%	45.913	11.2%	245.388	70.426	28.7%	148.718	60.6%	26.244	10.7%

Source: GMP Research field inputs from the various faucet manufacturers and plumbing wholesale, detailed architectural plans for homes with 0-5 bedrooms

Regional Market Penetration of WaterSense Toilets

USA										
	New England	Middle Atlantic	South Atlantic	East North Central	West North Central	East South Central	West South Central	Mountain	Pacific	US Average
States	CT, MA, ME, NH, RI, VT	NJ, NY, PA	DC, DE, FL, GA, MD, NC, SC, VA, WV	IL, IN, MI, OH, WI	IA, KS, MN, MO, ND, NE, SD	AL, KY, MS, TN	AR, LA, OK, TX	AZ, CO, ID, MT, NM, NV, UT, WY	AK, CA, HI, OR, WA	States
5.0 gpf	5.0%	5.5%	2.9%	6.0%	2.0%	5.3%	2.0%	3.5%	6.5%	4.5%
3.5 gpf	20.0%	21.9%	19.4%	35.4%	10.8%	34.0%	18.5%	14.0%	25.8%	22.2%
1.6 gpf Gravity	62.4	55.6%	66.0%	44.6%	71.6%	49.6%	68.3%	70.0%	55.0%	60.1%
1.6 gpf Pressure Assist	5.1%	7.0%	5.4%	7.2%	8.0%	6.0%	6.0%	6.3%	7.0%	6.2%
1.28 gpf Gravity	4.5%	5.2%	3.0%	2.9%	3.1%	2.9%	2.5%	4.2%	2.8%	3.7%
1.28 gpf Pressure Assist	1.0%	2.0%	0.7%	1.1%	2.5%	1.2%	1.7%	1.0%	1.4%	1.4%
Dual Flush	2.0%	2.8%	2.6%	2.8%	2.0%	1.0%	1.0%	1.0%	1.5%	1.9%
Total USA	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100%	100.0%



UNITED STATES

	Applications											All Toilets					
	Housing	Light Commercial								Commercial							
		Housing	Hotel	Restaurant	Nursing Home	Other Health Care	Retail Wholesale	Gov. building	Gas Station	Manufacturing	Other Commercial						
Total Residential Toilets																	
USA																	
5.0 gpf	12,778,050	243,865	23,625	86,650	3,855	107,535	1,220	2,060	19,680							12,778,050	3.9%
3.5 gpf	62,870,445	445,200	232,050	406,195	18,070	504,220	5,720	9,645	92,275							62,870,445	19.1%
1.6 gpf	169,835,550	1,259,640	626,850	1,149,280	51,135	1,426,640	9,135	27,290	261,080							169,835,550	51.7%
1.28 gpf	10,525,820	200,510	38,850	170,200	5,490	150,275	1,775	3,235	37,830							10,525,820	3.2%
1.6 gpf pressure	17,434,775	2,481,485	89,775	2,118,395	1,146,350	1,285,540	22,650	35,295	477,030							17,434,775	5.3%
1.28 gpf pressure	3,994,690	75,870	7,350	64,400	20,810	56,860	1,230	1,225	14,315							3,994,690	1.2%
Dual Flush	5,323,665	170,705.00	31,500	144,800	43,840	124,280	1,470	-								5,323,665	1.6%
Total Residential Toilets	282,762,995	4,877,275	1,050,000	4,140,000	1,289,550	3,655,350	45,200	78,750	902,210							282,762,995	86.1%
% of Residential Toilets	100.0%	1.72%	0.37%	1.46%	0.46%	1.29%	0.02%	0.03%	0.32%								
Total Commercial Toilets																	
Commercial Toilets	45,618,070	541,920	2,450,000	460,000	148,635	406,150	4,800	8,750	100,245	41,497,570						45,618,070	13.9%
% of Commercial Toilets	100.00%	1.2%	5.4%	1.0%	0.3%	0.9%	0.01%	0.02%	0.2%	90.97%						328,381,065	100.0%
All Toilets % of All Toilets																	
All Toilets	266,726,660	5,419,195	3,500,000	4,600,000	1,438,185	4,061,500	48,000	87,500	1,002,455	41,497,570						328,381,065	
% of All Toilets	81.22%	1.65%	1.07%	1.40%	0.44%	1.24%	0.01%	0.03%	0.31%	12.63%						100.0%	

CONCLUSIONS

In the case of WaterSense shower heads and lavatory faucets, we believe the best course of action is to continue to educate the consumer on the benefits of the WaterSense products.

WaterSense shower heads and lavatory faucets have achieved a healthy market penetration in a relatively short time period. In addition, a large number of homes are entering the next replacement cycle for shower heads and lavatory faucets. Home owners will be replacing their current shower heads and lavatory faucets with WaterSense labeled products, which will significantly increase the installed base for WaterSense shower heads and lavatory faucets.

In the case of WaterSense toilets, we believe significantly more work is needed for the products to gain comparable acceptance in the market place to the shower heads and lavatory faucets.

While manufacturers have invested heavily in the development of new products that feature superior performance, these products have not gained widespread acceptance with the end consumer.

We believe this is, in part, due to the 30 year replacement cycle for toilets. But we also believe the end consumer does not understand the advantages of the new WaterSense toilets.

We believe communities and utilities need to create financial incentives, which are geared at getting the home or the business owner to replace the 1.6 gpf toilets, or even the remaining 3.5 gpf toilets, with WaterSense certified 1.28 gpf toilets.

In conclusion, we believe:

- The market dynamics are working in favor of the WaterSense products. Houses that were constructed in the most recent building boom are approaching the time frame when shower heads and lavatory faucets are replaced. As 98% of the current products being manufactured are WaterSense certified, it is clear that, as the replacement cycle sets in, the current inefficient products will be replaced by WaterSense products, thus continuing to increase the installed base significantly.
- Concerning WaterSense toilets, more effective education of the end-consumer is needed. While manufacturers and industry advocates have spent significantly on advertising and public relations, the end-consumer simply is not aware, or is unwilling to recognize, the advantages of WaterSense toilets.
- We believe government officials and regulators are not sufficiently aware of the technological advancements that have taken place and the effect this has had on water conservation. We believe the industry needs to proactively communicate these technological advances with live flushing performances to augment the true water savings these products can achieve.
- We believe communities and water utilities need to invest in creating financial incentives, which will motivate home and business owners to swap out their existing water guzzling toilets with WaterSense products. We believe this will be the best and quickest tool to boost the market penetration of WaterSense products.
- We believe manufacturers should continue to invest in water saving technology and product advancements, but we need to understand that this is part of a long term strategy to reduce overall water consumption. New plumbing products and new plumbing technology take a very long time before they are accepted by the general public.

Product innovations are key to any industry. They are fundamental for the plumbing industry.

Mount Pleasant, July 2015
GMP Research Inc.

FINAL THOUGHTS

This report examines the market penetration of WaterSense shower heads, lavatory faucets and toilets, as was commissioned by the Plumbing Manufacturers International.

For more details and market insight, please contact Victor Post, Vice President and Managing Partner of GMP Research Inc. directly.

GMP Research Inc.
2999 River Vista Way
Mount Pleasant, SC 29466
Tel. 843-884-9567
email: vpost@gmpresearch.com