



Country:	Canada
Technology:	Washing Machines
Sub Category:	Domestic top and front loaders

Introduction

The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

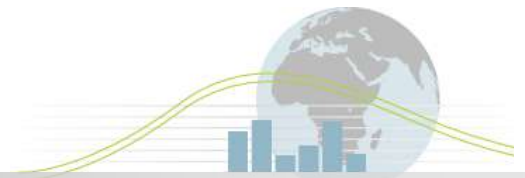
The summary definition for this product is:

<p>Washing machines, defined as: <i>'An appliance for cleaning and rinsing of textiles using water which is principally designed for use within a domestic environment. The appliance may draw water from a cold and/or hot water supply and may also have a means of extracting excess water from the textiles.'</i></p> <p>Data will be analysed for the following types of washing machine :</p>		
Technology	User intervention	All Types - Automatic, semi-automatic and manual
	Orientation	All Types - Horizontal (front loaders) and Vertical Plane (top loader)
	Configuration	All Types - Drum, Impeller, Agitator, Nutators Exclude all types of Washer/Dryer
	Coin/Card Operation	All Types
	Water intake	All Types - Hot fill/cold fill
	Spin Speed	All Speeds
Other variables	Capacity	Consider only units between 1Kg - 13kg (Use kWh/Kg as metric)

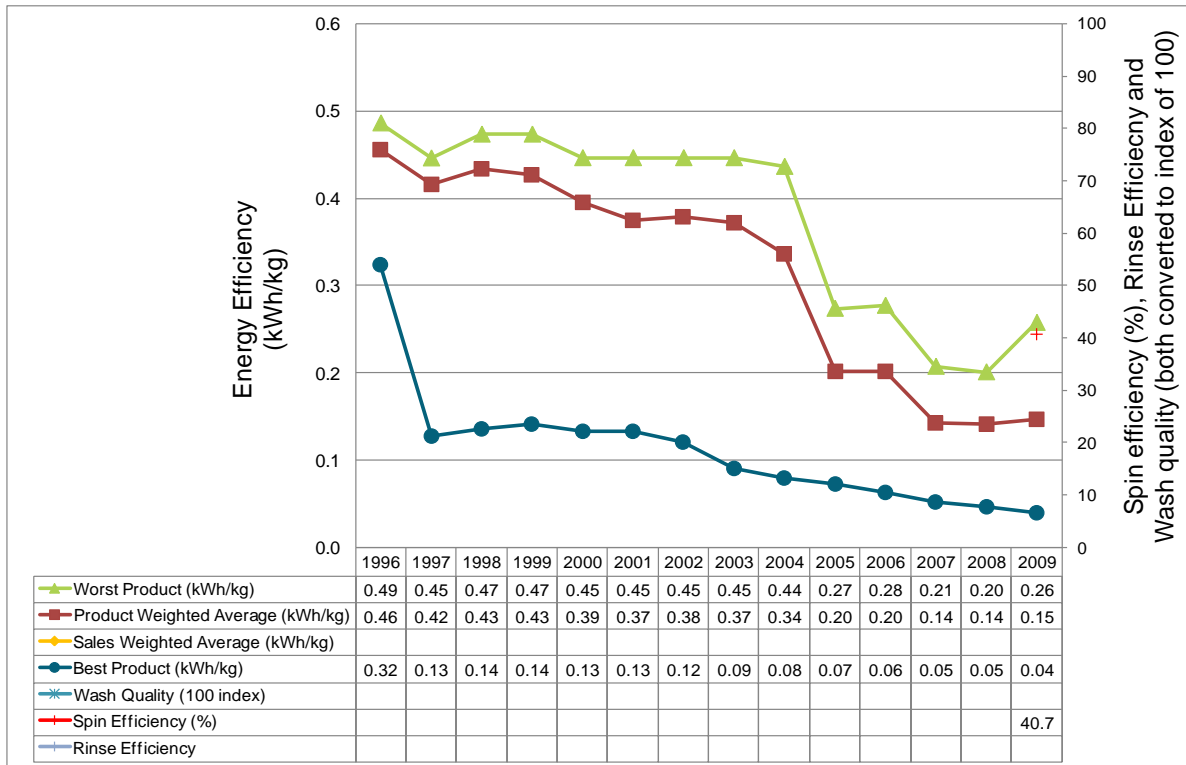
The detailed product definitions can be found at the Annex website:

<http://mappingandbenchmarking.iea-4e.org/matrix>



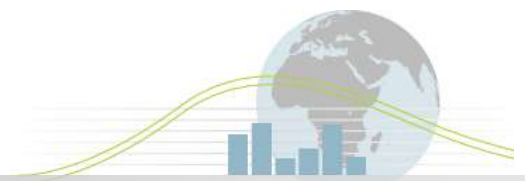


Energy Efficiency of New Washing Machines Canada

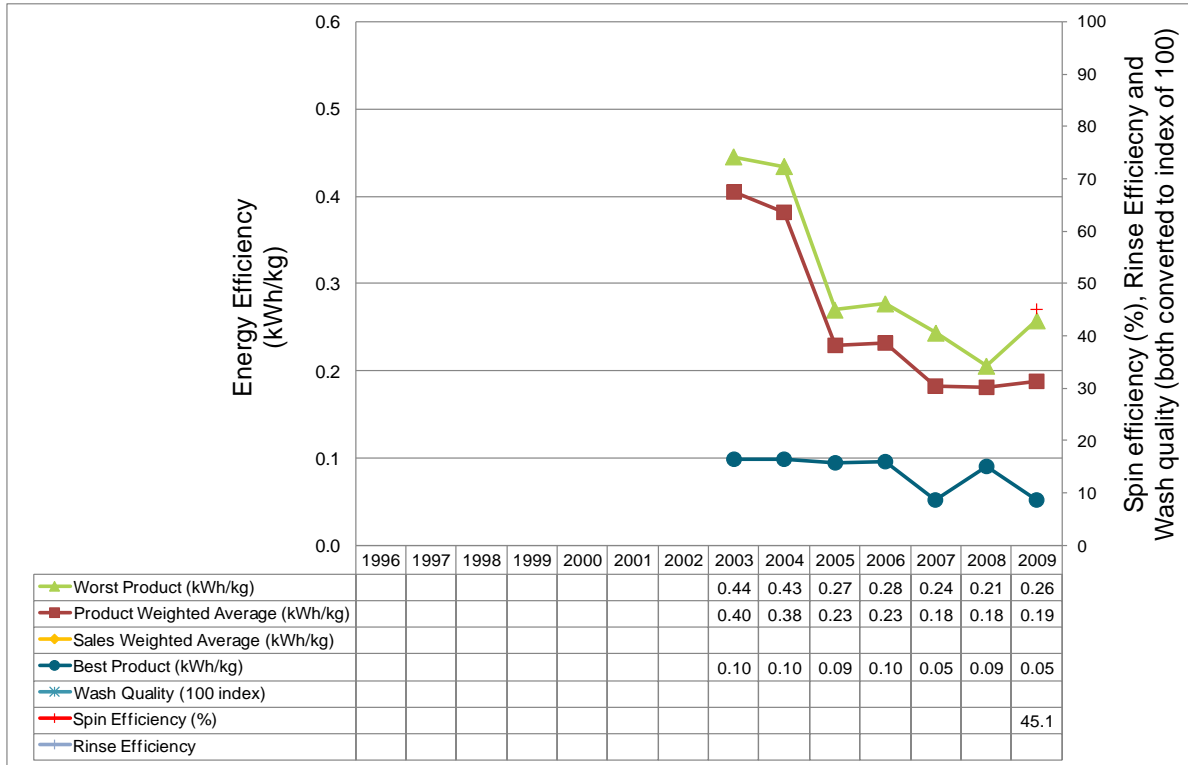


Key notes on Graph (see notes section 1)

- The rapid improvement in efficiency in 2004 is due to the introduction of the MEF (ie a revised regulatory requirement for efficiency - see section 1 of notes). It seems to have had a greater impact on the design of top loading washers (change in temperature and mechanical design) than front loaders. At the time top loaders continued to dominate the market which resulted in the overall results showing a significant drop in average energy consumption/efficiency improvement
- Unit consumption data was supplied on a consumption per year basis and has been converted to consumption per cycle. Load capacities have been converted from Container Volumes (L) to loads (kg) using the table which defines test loads in the Canadian test methodology. These derived values are used to calculate efficiencies in kWh/kg.
- In order to indicate a Worst performing product that reflects the broad market (as opposed to representing perhaps a single unusual or wrongly reported product), the 'energy efficiency of worst product' is in fact the energy efficiency of the product at the 'worst 5%' point of a ranked list in the dataset. The Best performing product is that with the lowest energy efficiency.
- Data for spin efficiency only recently become available and therefore only one data point



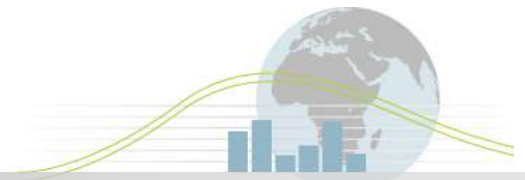
Energy Efficiency of New Top Loader Washing Machines Canada



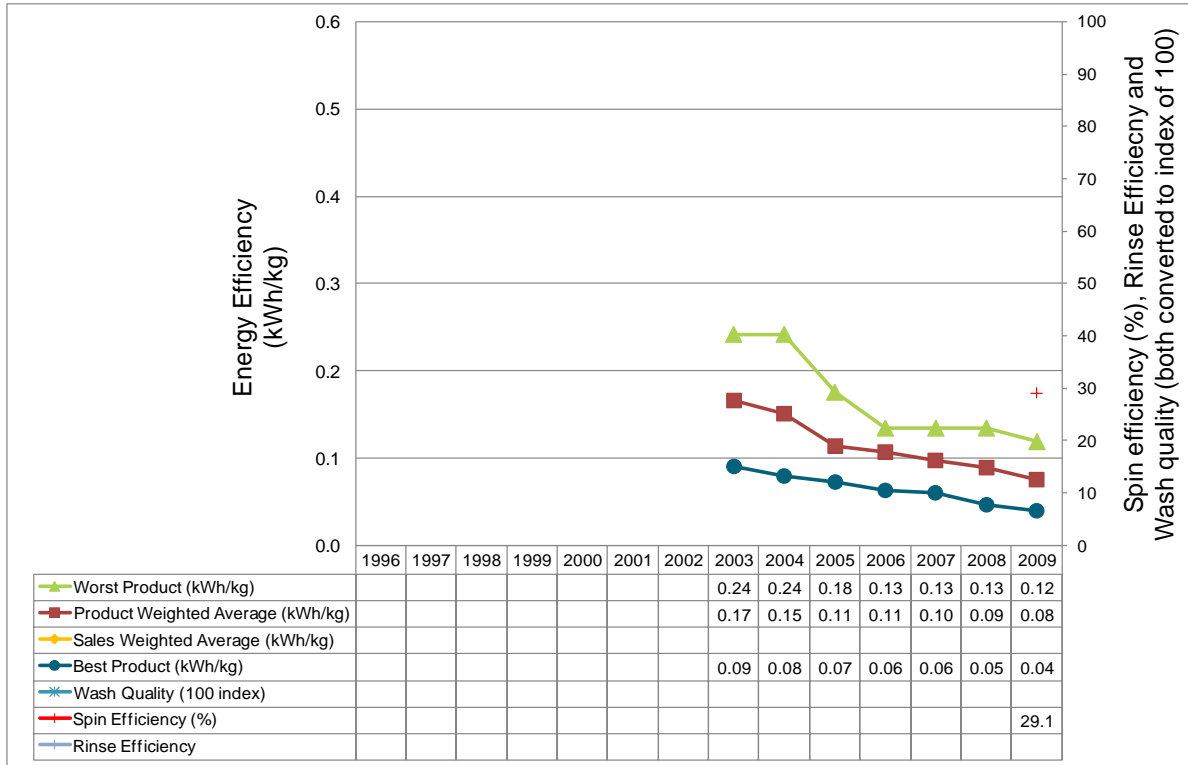
Key notes on Graph (see notes section 1)

- The orientation of machines is not available in the dataset prior to 2003
- Unit consumption data was supplied on a consumption per year basis and has been converted to consumption per cycle. Load capacities have been converted from Container Volumes (L) to loads (kg) using the table which defines test loads in the Canadian test methodology. These derived values are used to calculate efficiencies in kWh/kg.
- The rapid improvement in efficiency in 2004 is due to the introduction of the MEF (ie a revised regulatory requirement for efficiency - see section 1 of notes). It seems to have had a greater impact on the design of top loading washers (change in temperature and mechanical design) than front loaders. At the time top loaders continued to dominate the market which resulted in the overall results showing a significant drop in average energy consumption/efficiency improvement
- In order to indicate a Worst performing product that reflects the broad market (as opposed to representing perhaps a single unusual or wrongly reported product), the 'energy efficiency of worst product' is in fact the energy efficiency of the product at the 'worst 7.5%'¹ point of a ranked list in the dataset. The Best performing product is that with the lowest energy efficiency.
- Data for spin efficiency only recently become available and therefore only one data point

¹ A smaller dataset for top loaders in 2007 meant 7.5% was applied instead of 5% for this product in order that this method continued to exclude outlying products.



Energy Efficiency of New Front Loader Washing Machines Canada

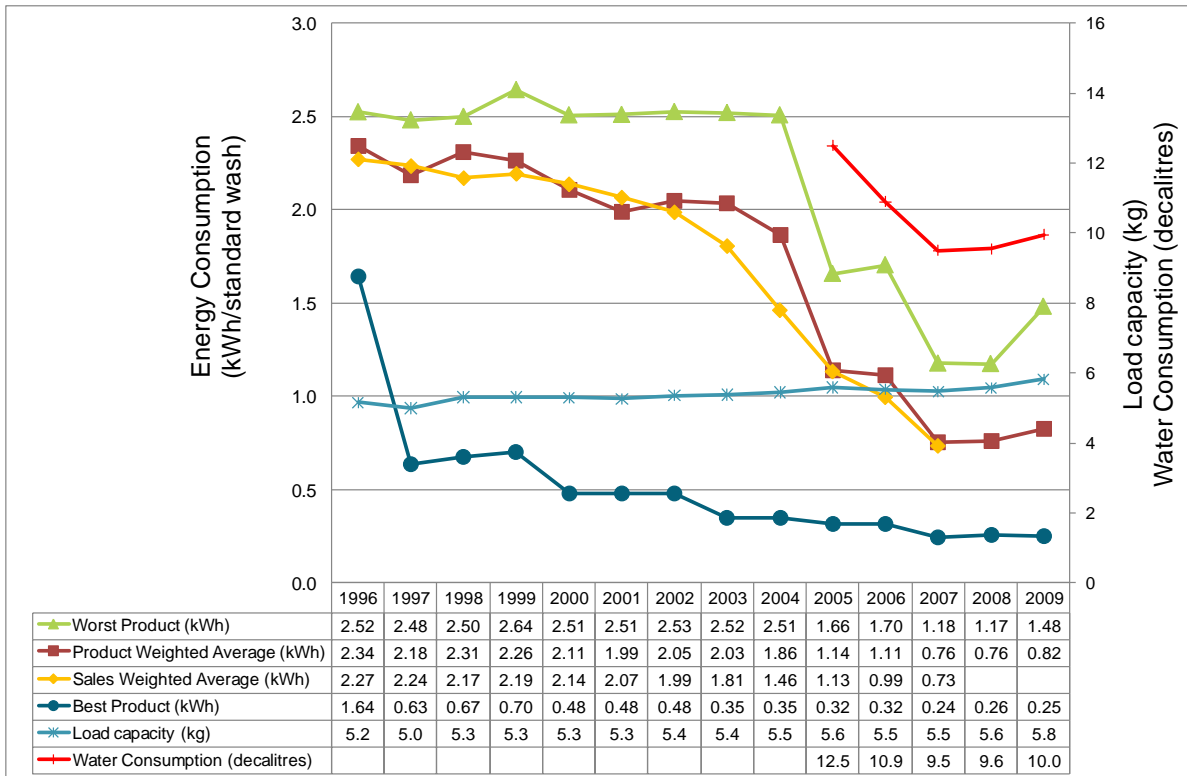


Key notes on Graph (see notes section 1)

- The orientation of machines is not available in the dataset prior to 2003
- Unit consumption data was supplied on a consumption per year basis and has been converted to consumption per cycle. Load capacities have been converted from Container Volumes (L) to loads (kg) using the table which defines test loads in the Canadian test methodology. These derived values are used to calculate efficiencies in kWh/kg.
- In order to indicate a Worst performing product that reflects the broad market (as opposed to representing perhaps a single unusual or wrongly reported product), the 'energy efficiency of worst product' is in fact the energy efficiency of the product at the 'worst 5%' point of a ranked list in the dataset. The Best performing product is that with the lowest energy efficiency.

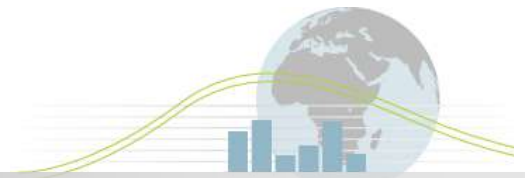


Energy Consumption of New Washing Machines Canada

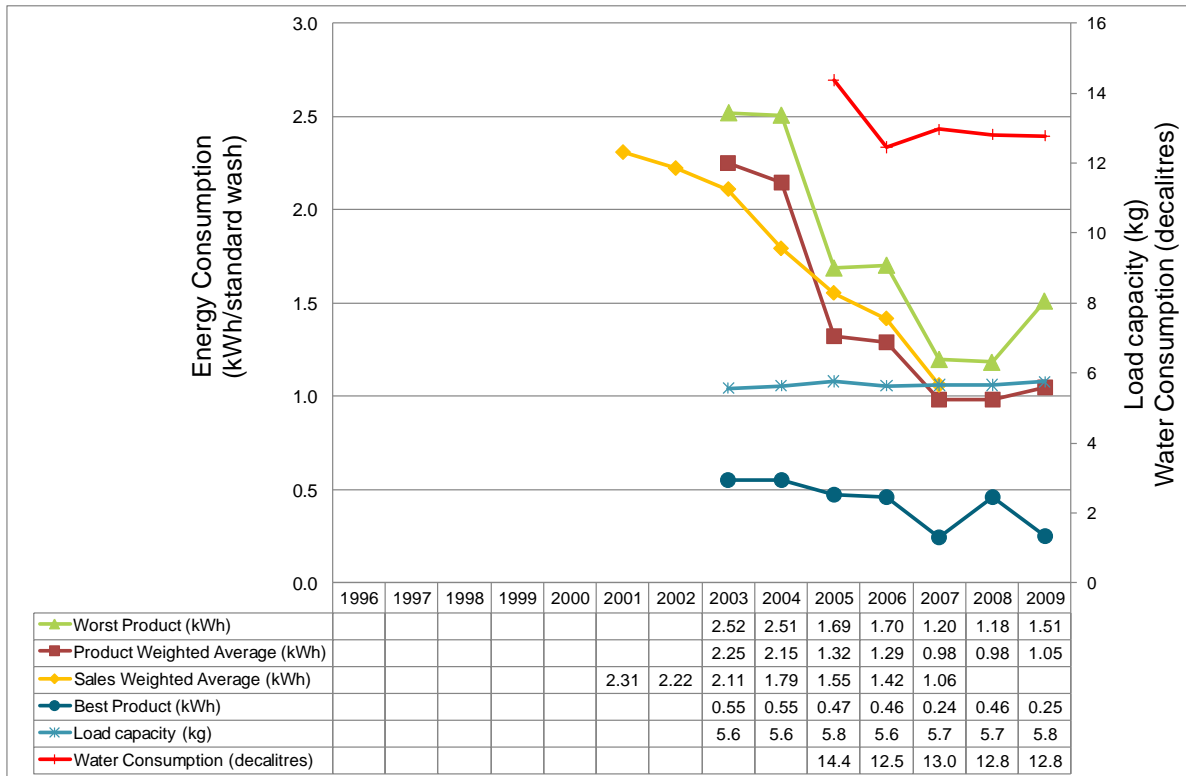


Key notes on Graph (See notes section 2)

- Sales Weighted Average Consumption data and Product Weighted Data (including best and worst performing products) are from different data reports
- Unit consumption data was supplied on a consumption per year basis and has been converted to consumption per cycle. Load capacities have been converted from Container Volumes (L) to loads (kg) using the table which defines test loads in the Canadian test methodology.
- The drop in consumption in 2004 is due to the introduction of the MEF (ie a revised regulatory requirement for efficiency - see section 1 of notes). It seems to have had a greater impact on the design of top loading washers (change in temperature and mechanical design) than front loaders. At the time top loaders continued to dominate the market which resulted in the overall results showing a significant drop in average energy consumption
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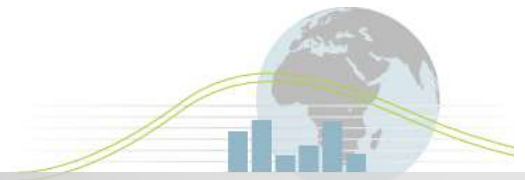


Energy Consumption of New top loader Washing Machines Canada

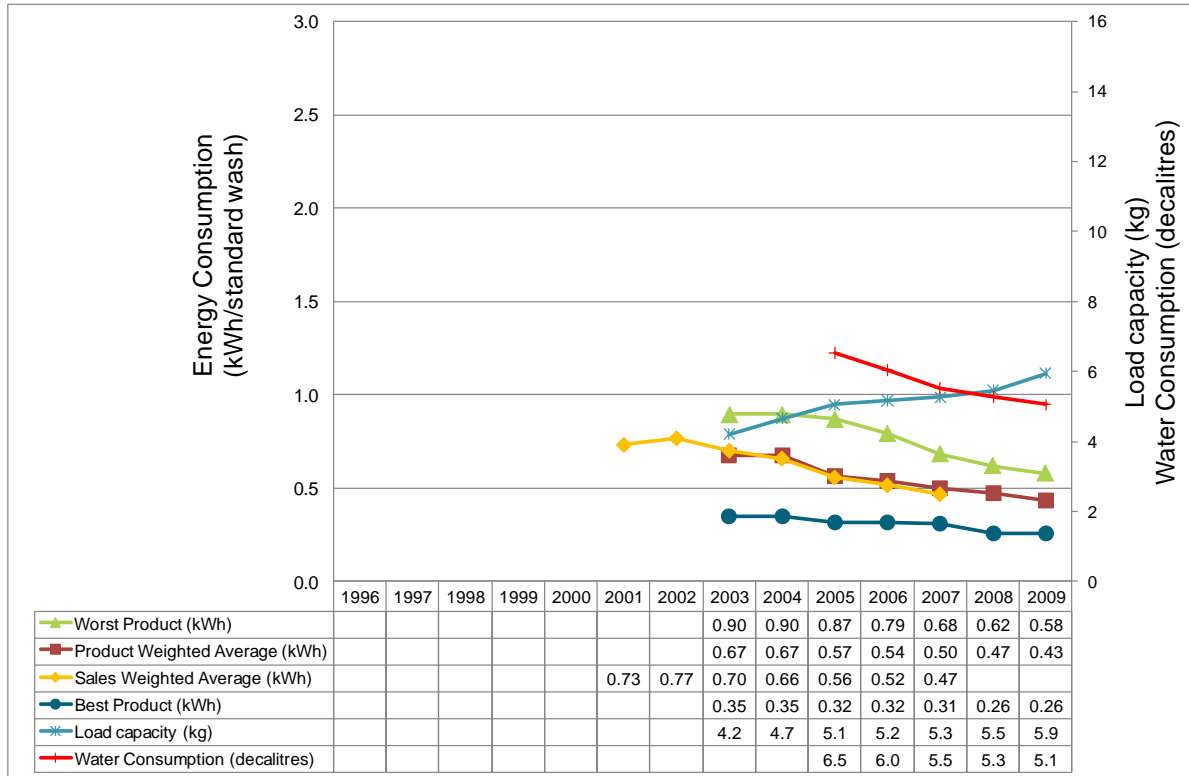


Key notes on Graph (See notes section 2)

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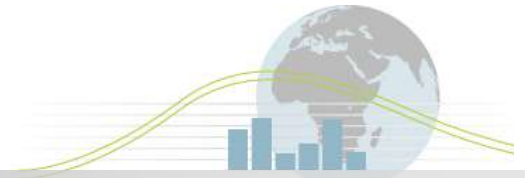
Energy Consumption of New front loader Washing Machines Canada



Key notes on Graph (See notes section 2)

- Sales Weighted Average Consumption data and Product Weighted Data (including best and worst performing products) are from different reports
- Unit consumption data was supplied on a consumption per year basis and has been converted to consumption per cycle. Load capacities have been converted from Container Volumes (L) to loads (kg) using the table which defines test loads in the Canadian test methodology.
- In order to indicate a Worst performing product that reflects the broad market (as opposed to representing perhaps a single unusual or wrongly reported product), the 'energy efficiency of worst product' is in fact the energy efficiency of the product at the 'worst 5%' point of a ranked list in the dataset. The Best performing product is that with the lowest energy efficiency.

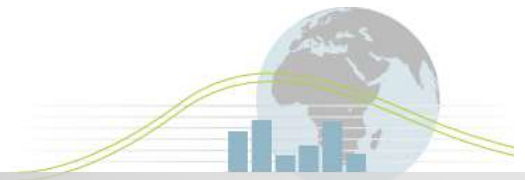




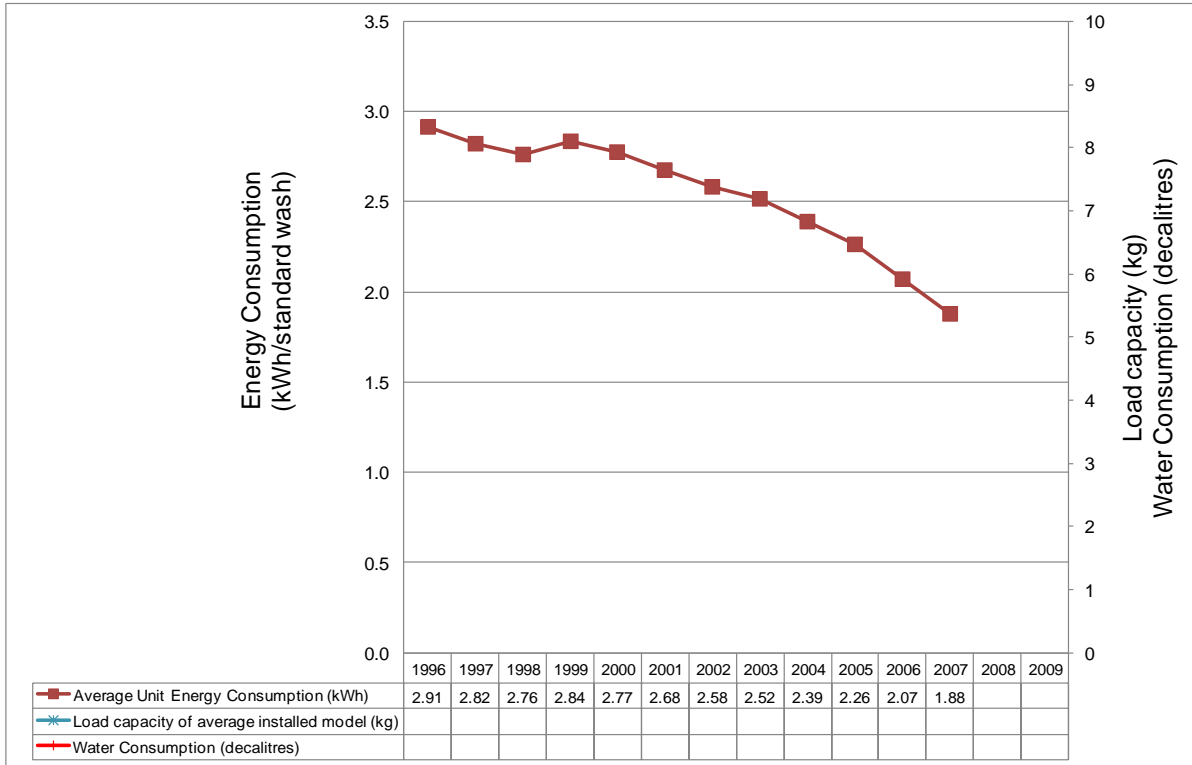
Unit Energy Efficiency in the Installed Washing Machines Stock - Canada

Unable to plot this graphic as insufficient data is available on the load capacity of units in stock. However, limited information is provided on the capacity of units in stock in Section 3 of the Notes. Other information is included on knowledge of stock including washes per week, temperature of washes, age profile of units in stock, etc.





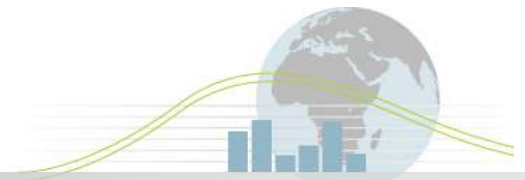
Unit Energy Consumption in the Installed Washing Machines Stock - Canada



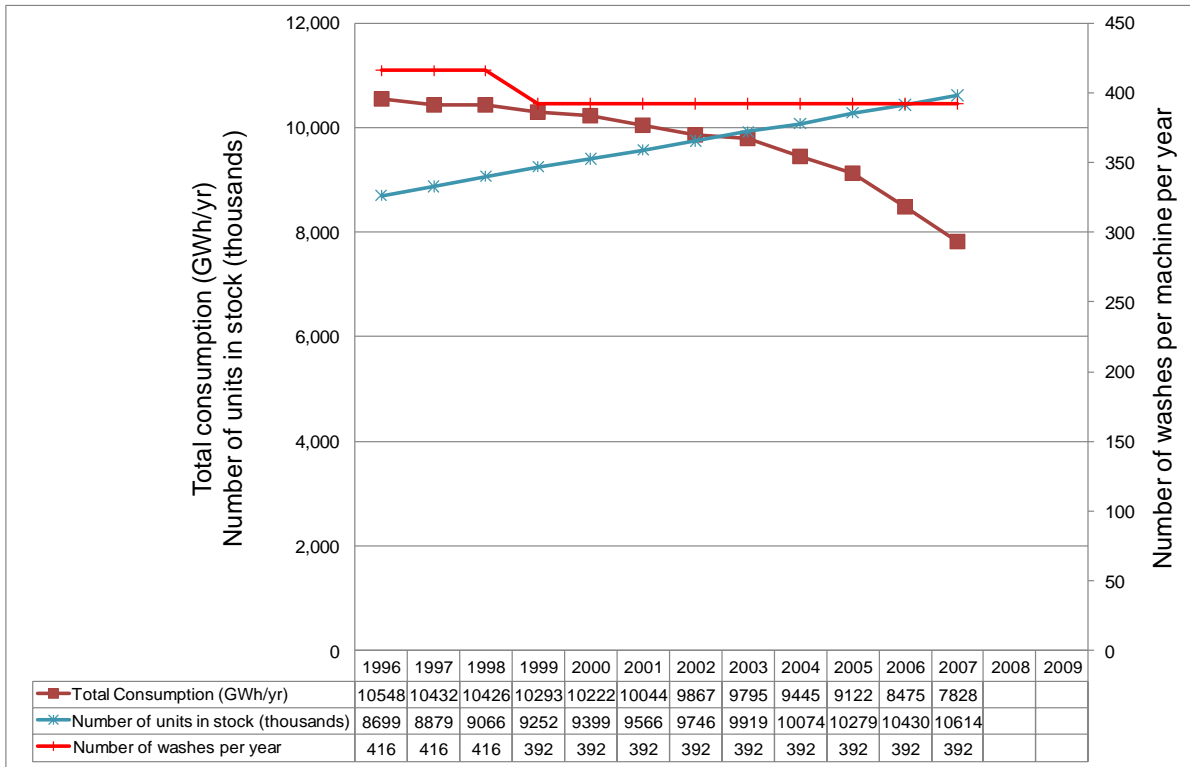
Key notes on Graph (See notes section 3)

- No detailed average load capacities are known for the stock. However, limited information is provided on the capacity of units in stock in Section 3 of the Notes. Other information is included on knowledge of stock including washes per week, temperature of washes, age profile of units in stock, etc.





Energy Consumption in the installed Washing Machines Stock Canada



- Projections shown are based partially on market survey and partially on projection. Underlying assumptions in the projection are not all known so graphic should be treated with caution.



Major Policy Interventions (See notes Section 5)

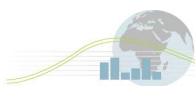
Canada has two primary federal policy interventions related to the energy efficiency (MEPS and EnerGuide labeling) of washers, dryers and integrated clothes washer-dryers; a third policy relates only to washers and the washing component of integrated products:

- **Minimum Energy Performance Standards (MEPS):** The “Energy Efficiency Act”, enacted in 1992, gives the Government of Canada the authority to make and enforce regulations on performance standards and labelling requirements for energy-using products that are imported into Canada or shipped across provincial and/or territorial borders for the purpose of sale or lease.

MEPS for washers, dryers and integrated clothes washer-dryers were first introduced in May 1995, shortly after the registration of the “Energy Efficiency Regulations” in February 1995. Since then, two amendments have been made to the Regulations concerning domestic laundry equipment. Amendment 8, published in September 2004, introduced two levels of more stringent minimum Modified Energy Factors (MEF) for residential washers and integrated clothes washer-dryers that came into effect in 2004 and 2007. Amendment 10, published in December 2008, established MEPS for residential-style commercial clothes washers.

Generally, regulations and MEPS serve in transforming the Canadian marketplace by eliminating products with poor energy efficiency performance, while fostering a commitment to improving efficiency for energy-using equipment.

- **Mandatory Labelling:** The EnerGuide label was introduced in 1978 under the “Consumer Packaging and Labelling Act”(1971), giving Canadians the opportunity to compare the energy consumption of major electrical household appliances, including washers, dryers, and integrated equipment. With the enactment of the “Energy Efficiency Regulations”, placement of the EnerGuide label on major electrical household appliances and room/window air conditioners became mandatory. In addition to providing the average annual energy consumption of appliances, the EnerGuide label also includes a scale showing how the given appliance compares with other similar products in terms of annual energy consumption.
- **Voluntary Labelling:** In 2001, Canada officially introduced ENERGY STAR. Washers and the washer component of integrated clothes washer/dryers that exceed the regulated performance standards by approximately 30% and use 35% to 50% less water than comparable models in the market are eligible for the ENERGY STAR label. ENERGY STAR has also been integrated with the EnerGuide label to further enable consumers to identify the most energy efficient products.
- **Conformity Assessment:** Various monitoring activities are utilized achieving a high level of compliance: self-monitoring by manufacturers and dealers; monitoring by regulatory authorities including NRCan designated inspectors, provincial partners, and Canada Customs and Border Services (CBSA); market surveys, product testing and electronic monitoring of energy efficiency reports and imports; third-party verification mark issued by independent certification organizations accredited by the





Standards Council of Canada; and finally with complaints and tips from dealers, manufacturers and consumers. Compliant products are listed on NRCan's website² and in product directories for consumers, utilities, dealers, and the public. The data is monitored electronically to detect non-compliant products.

In addition to these major policy interventions, federal, provincial and territorial governments and utilities have also introduced programs to encourage the purchase and use of energy efficient equipment, including grants, rebates and incentives programs.

² <http://oee.nrcan.gc.ca/residential/personal/new-appliances.cfm?attr=4>

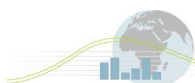


Cultural Issues (See Notes Section 6)

- The total number of Canadian households with a washing machine has remained relatively flat, with ownership changing slowly from almost 81% in 2002 to 82% in 2007;
- In 2007, the majority of new washer models (71%) used less than 400 kWh per year, whereas in 1990 the majority of new washer models (64.3%) used more than 1000 kWh annually. In 2007 the products had an average annual energy consumption for front-loading washer of approximately 184 kWh and approximately 415 kWh for top-loading (the equivalent for the later during the 1980s was 1360 kWh, while in the 1990s it was 1218 kWh.)
- The popularity of front-loading machines has grown dramatically among Canadians. In 2001, they represented just under 16%³ of market share; by 2008, 57%⁴ of new washer models were front-loading.
- Canadians continue to prefer full-size washers, while market stock in compact and stacked models has declined. From 2002 to 2008, shipments of full-size models grew from 92% to slightly over 94% of market share, whereas shipments of compact and stacked washers declined from 2% to 1%, and 6.5% to 4.6%, respectively (2008 Major Appliance Industry Trends and Forecast, CAMA, 2009);
- The average useful life of a domestic washing machine is 15 years (2008 Major Appliance Industry Trends and Forecast, CAMA, 2009);
- Shipments to retail, building, and other consumers of ENERGY STAR washers have grown significantly from 24% in 2003 to 64% in 2008.

³ Energy Consumption of Major Household Appliances Shipped in Canada, Trends for 1990-2006, Natural Resources Canada, December 2008

⁴ 2008 Major Appliance Industry Trends and Forecast, Canadian Appliance Manufacturers Association, 2009)



Notes on data

Section 1: Notes on Product Efficiency

1.1 Test methodologies and Performance Standards

1.1.1 Regulatory Scope

- CSA/C360-03 harmonized with the AHAM test procedure

Regulations apply to:

- “Compact” type includes all household clothes washers with a tub capacity of less than 1.6 cu. ft. or 13 gallons of water.
- “Standard” type includes all household clothes washers with a tub capacity of 1.6 cu. ft. or 13 gallons of water or more.

ENERGY STAR⁵, products are restricted to front and top loader standard clothes washers with capacities of greater than 1.6 ft³, in Canada, clothes washers must be tested to CSA/C360 in order to determine the MEF; the clothes washers must meet the Regulations first in order to be qualified for E*.

1.1.2 Test methodology

Canadian Standard Association CSA/C360-03 is harmonized with AHAM test procedure (Association of Home Appliance Manufacturers Performance Evaluation Procedure for Household Washers ANSI/AHAM HLW-1-2007⁶).

1.1.3 Key Testing Parameters and Regulatory Requirements

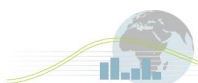
Summary of requirements

MEPS for washers, dryers and integrated clothes washer-dryers were first introduced in May 1995, shortly after the registration of the “Energy Efficiency Regulations” in February 1995. Since then, two amendments have been made to the Regulations concerning domestic laundry equipment. Amendment 8, published in September 2004, introduced two levels of more stringent minimum Modified Energy Factors (MEF) for residential washers and integrated clothes washer-dryers that came into effect in 2004 and 2007.

Premium requirements are required for products to be registered by ENERGY STAR.

⁵ http://www.energystar.gov/index.cfm?c=clotheswash.pr_crit_clothes_washers

⁶ CSA/C360-03 can be purchased at <http://www.csa.ca/cm/ca/en/home>; Available for purchase at <http://www.aham.org/ht/d/ProductDetails/sku/4045-110-140/from/714/pid/5132>.



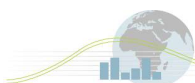


Evolution of MEPS and ENERGY STAR for Clothes Washers

Effective Date	Minimum MEF	ENERGY STAR MEF + WF
1995	1.18 (EF)	2.50 (EF)
January 1, 2001	1.18 (EF)	1.26
January 1, 2004	1.04	1.42
January 1, 2007	1.26	1.72 + 8.0
July 1, 2009	1.26	1.8 + 7.5
January 1, 2011	TBD	2.0 + 6.0

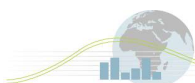
Summary Details of Testing Requirements

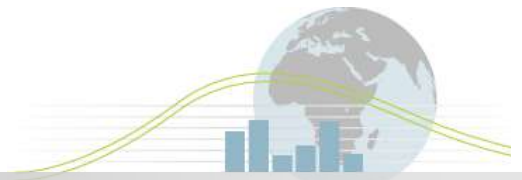
Standard Number (test)	CSA/C360-03 (identical to AHAM test procedure)
Standard Scope	Compact clothes washers with clothes container capacity of less than 1.6 ft ³ (45 L); Standard clothes washers with clothes container capacity of 1.6 ft ³ (45 L) or greater.
Voltage	120V 60Hz
Test Cycle	Variable depending on washer unit type, water and temperature control. Energy test cycle for cottons and linens.
Load/Capacity	Capacity of unit defined by maximum amount of water that can be held in the "clothes container" (measured by sealing clothes container with plastic coating and filling with water) Maximum, minimum, and, when required, average test load sizes shall be determined using Table 3 (as per C360-03) 5.4 and the clothes container capacity as measured in 5.1(as per C360-03) Table 3 (as per C360-03) defines the test load sizes, load make up and corresponding water fill settings which are to be used when measuring water and energy consumptions





<p>Water Supply</p>	<p><i>Clothes washers in which electrical energy consumption or water energy consumption are affected by the inlet water temperature. (For example, water heating clothes washers or clothes washers with thermostatically controlled water valves.). The temperature of the hot water supply at the water inlets shall not exceed 135 °F (57.2 °C) and the cold water supply at the water inlets shall not exceed 60 °F (15.6 °C).</i></p> <p><i>Clothes washers in which electrical energy consumption and water energy consumption are not affected by the inlet water temperature. The temperature of the hot water supply shall be maintained at 135 °F±5 °F (57.2 °C±2.8 °C) and the cold water supply shall be maintained at 60 °F±5 °F (15.6 °C±2.8 °C).</i></p>
<p>Water Test Temperature</p>	<p><i>Variable depending on washer unit type, water and temperature control. Typical tests uses (adjusted) average of a combination of temperatures</i></p>
<p>Energy Consumption per Cycle</p>	<p><i>The total clothes washer energy consumption per cycle, with such energy consumption expressed as the (adjusted) sum of the machine electrical energy consumption, the hot water energy consumption, and the energy required for removal of the remaining moisture in the wash load.</i></p> <p><i>Consumption is typically averaged across a number of cycle types.</i></p>
<p>Cycle Efficiency</p>	<p><i>Modified Energy Factor (MEF) is the quotient of the litres capacity of the clothes container divided by the total clothes washer energy consumption per cycle L/kWh/cycle.</i></p> <p><i>Prior to 2004, Energy Factor (EF) used with differing derivation.</i></p>
<p>Measurement of Water Consumption</p>	<p><i>WF is the quotient of the total weighted per-cycle water consumption, divided by the capacity of the clothes washer.</i></p> <p><i>Total weighted per-cycle water consumption is variable depending on washer unit type, water and temperature control and is typically averaged across a number of cycle types.</i></p>





Spin Extraction Ratio

Typically: ((Weight of Test Load After Cycle-Weight of Bone Dry Test Load)/Weight of Bone Dry Test Load) x 100, with slight modifications depending on unit type and wash temperatures. Maximum Load Capacity required for the test.

Bone-dry means a condition of a load of test cloth which has been dried in a dryer at maximum temperature for a minimum of 10 minutes, removed and weighed before cool down, and then dried again for 10 minute periods until the final weight change of the load is 1 percent or less.

1.2 Product Efficiency Graphic

1.2.1 Sources:

- Energy Consumption of Major Household Appliances Shipped in Canada, Trends for 1990-2007, Natural Resources Canada, December 2009⁷
- Major Appliance Industry Trends and Forecast, Canadian Appliance Manufacturers Association, 2008 and 2009 (confidential)
- Energy Use Data Handbook tables 1990-2007⁸

1.2.2 Data Clarifications

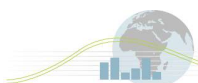
Data on capacity was supplied as a drum volume. To convert this to a load in kg, table 3 from the CSA/C360-03 standard was used. This table is drawn directly from the Canadian regulations where it is used to define test loads in the Canadian test methodology. The maximum load in the table for a given capacity range has been used here to create an equation from which an equivalent load in kg could be calculated for any given volume declared by manufacturers. The resulting formula is:

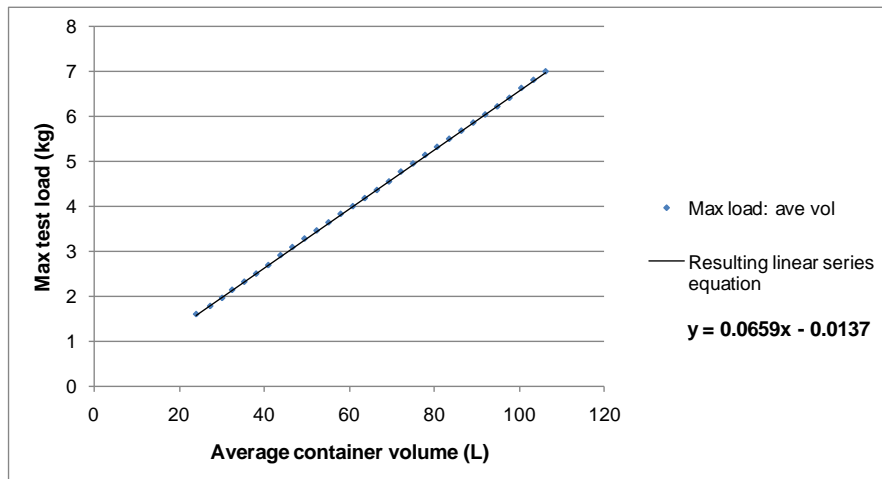
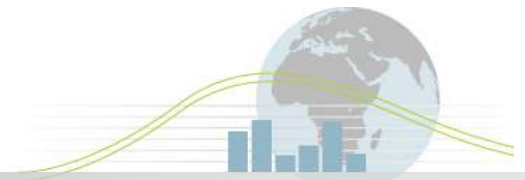
$$\text{Load (kg)} = 0.0659 \text{ Container volume (L)} - 0.0137$$

The formula is shown in the graph below.

⁷ <http://oee.nrcan.gc.ca/Publications/statistics/cama09/index.cfm?attr=0>

⁸ http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tableshandbook2/res_00_16_e_4.cfm?attr=0





Additionally, unit consumption data while determined on a per cycle basis, was supplied on a consumption per year basis. To convert to consumption per cycle, the following conversions have been used based on Canadian mandatory regulations:

- Up to 1998: 416 cycle/years
- After 1998: 392 cycle/years

Additional Specific Data Cautions

The dataset varied in size by year from 204 to 871 units with an average of 393 units. Although each dataset is considered to be representative, this can have some analytical impacts e.g. on the method for selecting the average values for the worst products.

1.2.3 Proportion of data set included

2006 - 2 units out of 483 (no consumption value)

1.2.4 Key calculations undertaken

Additional key calculations on data are as follows:

Declared Unit Load Capacity: Unit load capacity in kg is defined by local regulations and declared by manufacturers Unit kg).

(Note: This capacity is defined using the mixture of materials defined in the local regulations which is not necessarily in line with the mixture of material used elsewhere (for local load mix, refer to Section 1.1 on “Notes on Data”).

Model Energy Consumption: Model Energy Consumption is the energy consumed by the unit to complete one wash cycle as defined by local test conditions (Unit: kWh/wash).





Sales Weighted Energy Consumption of New Models: Value calculated by [Sum of (Model Energy Consumption multiplied by sales volume of Model in year) for all Models] divided by [Sum of (sales volume of all Models in year)]. Unit kWh/wash.

Model Weighted Consumption of New Models: Value calculated by [Sum of (Model Energy Consumption for all models sold in year)] divided by [Sum of (Number of Models sold in year)]. Unit kWh/wash.

Model Energy Efficiency: Value calculated by dividing Model Energy Consumption by Declared Unit Load Capacity (kWh/Kg/Wash).

Sales Weighted Energy Efficiency of New Models: Value calculated by [Sum of (Derived Model Energy Efficiency multiplied by sales volume of Model in year) for all Models] divided by [Sum of sales volume of all Models in year]. Unit kWh/kg/Wash.

Model Weighted Energy Efficiency of New Models: Value calculated by [Sum of Model Energy Efficiency for all models sold in year] divided by [Number of Models sold in year]. Unit kWh/Kg/Wash.

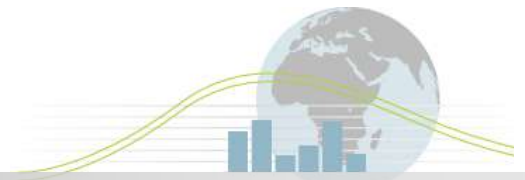
Spin Efficiency: The efficiency of removal of water from the test load as defined in local test conditions (refer to Section 1.1 on “Notes on Data”).

Wash Quality: The efficiency of cleansing of test load as defined in local test conditions (refer to Section 1.1 on “Notes on Data”).

Rinse Efficiency: The efficiency of removal of detergent, softener or other additive from the test load as defined in local test conditions (Unit: comparative percentage).

Spin Speed: The highest spin speed attainable by the unit (Unit: revolutions per minute – rpm).





Section 2: Notes on Product Consumption

2.1 Test methodologies, Performance Standards and Labelling Requirements

Refer to section 1.1

2.2 Product Consumption Graphic

Refer to section 1.2



Section 3: Notes on the Efficiency and Consumption of Units in the Installed Stock

3.1 Unit Stock Efficiency Graphic

3.1.1 Data Source

None

3.1.2 Data Clarifications

None

3.2 Unit Stock Consumption Graphic

3.2.1 Data Source

- i) Energy Use Data Handbook tables 1990-2007⁹
- ii) Energy Consumption of Major Household Appliances Shipped in Canada --- Trends for 1990-2006 (Dec 2008)

3.2.2 Data Clarifications

Source i) provides:

- A. Annual Energy Consumption (AEC) of New Clothes Washers excluding hot water requirements
- B. AEC of Stock Clothes Washers excluding hot water requirements

Source ii) provides:

- C. shipment weighted average AEC of New Clothes washers including hot water requirements.

AEC of stock including hot water requirements was calculated as: $B / (A/C)$

3.3 Available Information on Capacity of Units in Stock

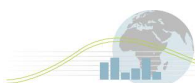
3.3.1 Data Source

Information in this sub-section is drawn from:

- 2007 Survey of Household Energy Use - Detailed Statistical Report (December 2010)¹⁰

⁹ http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tableshandbook2/res_00_16_e_4.cfm?attr=0

¹⁰ <http://oee.nrcan.gc.ca/Publications/statistics/sheu07/index.cfm?attr=0>





- *Based on 1997 Survey of Household Energy Use - Detailed Statistical Report, December 2000*
- *National Resources Canada*¹¹

Please refer to the individual survey for details of data collection, calculations and assumptions made.

¹¹ http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/tableshandbook2/res_00_15_e_3.cfm?attr=0

3.3.2 Stock-information

2007 Survey of Household Energy Use

(The letter beside each estimate classifies its quality as follows: **A** – Acceptable, **M** – Use with caution, **U** – Too unreliable to be published)

Macro Data

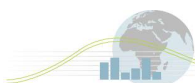
Total Number of Households	12,932,350
----------------------------	------------

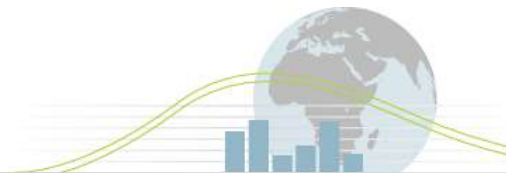
Households with a clothes washer

Yes	11 414 615	A
No	1 287 211	A
Not stated	230 524	A

Type of clothes washer

Standard top-loading	8 122 433	A
Standard front-loading	2 043 261	A
Washer/dryer combination with top-loading washer	451 048	A
Washer/dryer combination with front-loading washer	265 823	A
Other	72 060	M
Don't know		U
Not stated	633 403	A





Size of the clothes washer

<i>Mini (compact – less than 45 litres/10 gallons)</i>	<i>501 622</i>	<i>A</i>
<i>Standard (full size – greater than or equal to 45 litres/10 gallons)</i>	<i>10 141 950</i>	<i>A</i>
<i>Don't know</i>	<i>438 669</i>	<i>A</i>
<i>Not stated</i>	<i>562 898</i>	<i>A</i>

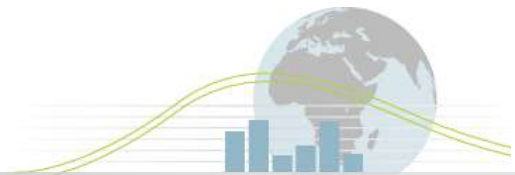
Age of the clothes washer

<i>5 years or less</i>	<i>4 689 260</i>	<i>A</i>
<i>6 to 10 years</i>	<i>3 136 532</i>	<i>A</i>
<i>11 to 15 years</i>	<i>1 547 284</i>	<i>A</i>
<i>16 to 20 years</i>	<i>704 323</i>	<i>A</i>
<i>21 to 25 years</i>	<i>262 145</i>	<i>A</i>
<i>26 years or more</i>	<i>147 785</i>	<i>A</i>
<i>Don't Know</i>	<i>516 858</i>	<i>A</i>
<i>Not stated</i>	<i>640 952</i>	<i>A</i>

Households with an ENERGY STAR clothes washer

<i>Yes</i>	<i>4 565 242</i>	<i>A</i>
<i>No</i>	<i>3 149 964</i>	<i>A</i>
<i>Don't know</i>	<i>2 035 179</i>	<i>A</i>
<i>Not stated</i>	<i>1 894 754</i>	<i>A</i>





Water temperature used most for washing clothes

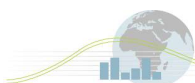
<i>Hot</i>	<i>465 974</i>	<i>A</i>
<i>Cold</i>	<i>5 497 525</i>	<i>A</i>
<i>Warm</i>	<i>5 073 881</i>	<i>A</i>
<i>Don't know</i>	<i>73 456</i>	<i>M</i>
<i>Not stated</i>	<i>534 302</i>	<i>A</i>

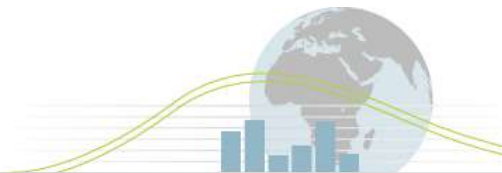
Water temperature used most for rinsing clothes

<i>Hot</i>	<i>120 044</i>	<i>M</i>
<i>Cold</i>	<i>9 068 671</i>	<i>A</i>
<i>Warm</i>	<i>1 784 275</i>	<i>A</i>
<i>Don't know</i>	<i>158 380</i>	<i>M</i>
<i>Not stated</i>	<i>513 768</i>	<i>A</i>

Loads of clothes washed in an average winter week

<i>One or less</i>	<i>1 041 058</i>	<i>A</i>
<i>Two to three</i>	<i>3 946 600</i>	<i>A</i>
<i>Four to seven</i>	<i>4 245 478</i>	<i>A</i>
<i>More than seven</i>	<i>1 378 024</i>	<i>A</i>
<i>Don't know</i>	<i>370 696</i>	<i>A</i>
<i>Not stated</i>	<i>663 282</i>	<i>A</i>





Loads of clothes washed in an average summer week

<i>One or less</i>	<i>922 420</i>	<i>A</i>
<i>Two to three</i>	<i>3 923 309</i>	<i>A</i>
<i>Four to seven</i>	<i>4 493 369</i>	<i>A</i>
<i>More than seven</i>	<i>1 276 270</i>	<i>A</i>
<i>Don't know</i>	<i>422 063</i>	<i>A</i>
<i>Not stated</i>	<i>607 707</i>	<i>A</i>

Frequency a household member ensures that the clothes washer is full before it is turned on

<i>Always</i>	<i>8 027 578</i>	<i>A</i>
<i>Often</i>	<i>1 591 971</i>	<i>A</i>
<i>Sometimes</i>	<i>609 658</i>	<i>A</i>
<i>Rarely or never</i>	<i>520 198</i>	<i>A</i>
<i>Do not have a clothes washer in the dwelling</i>	<i>1 287 211</i>	<i>A</i>
<i>Don't know</i>	<i>158 451</i>	<i>A</i>
<i>Refusal</i>	<i>737 283</i>	<i>A</i>





Based on 1997 Survey of Household Energy Use - Detailed Statistical Report, December 2000

Macro Data:

Total Number of Households	8,162,200	
Households using washing machines	7,871,900	(96.4%)

Type of machine:

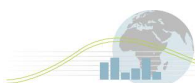
	Households	Percentage of Total with a Washing Machine	Percentage of Total Households
Automatic	7,714,462	98.00%	94.51%
Washer/dryer combination	94,463	1.20%	1.16%
Wringer or other	62,975	0.80%	0.77%

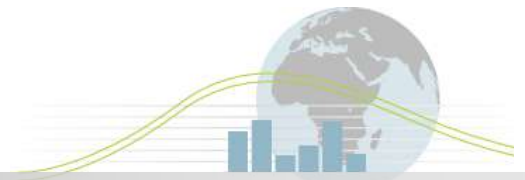
Age Profile of Washing Machines in Use:

Age	Percentage of Installed Units
1 year or less	6.6.%
from 2 to 5 years	27.40%
from 6 to 10 years	34.00%
from 11 to 15 years	16.80%
from 16 to 20 years	10.10%
over 20 years	5.10%
Average age (years)	9.4

Unit Capacities:

Very small (less than 60L)	0.024%
Standard (60-80L)	78.10%
Large (80+L)	19.50%





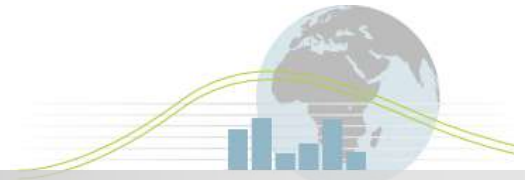
Typical Wash and Rinse Water Temperatures:

Wash	
Hot Water	5.70%
Warm water	65.80%
Cold water	28.50%
Rinse:	
Hot Water	0.50%
Warm water	20.70%
Cold water	78.80%

Wash loads per week:

1 or less	5.80%
2 or 3	25.20%
4 or 5	24.10%
6 or 7	18.30%
8 to 13	17.60%
14 and more	9.10%
Average	6.3





Section 4: Notes on Consumption of Stock

Refer to Notes Section 3



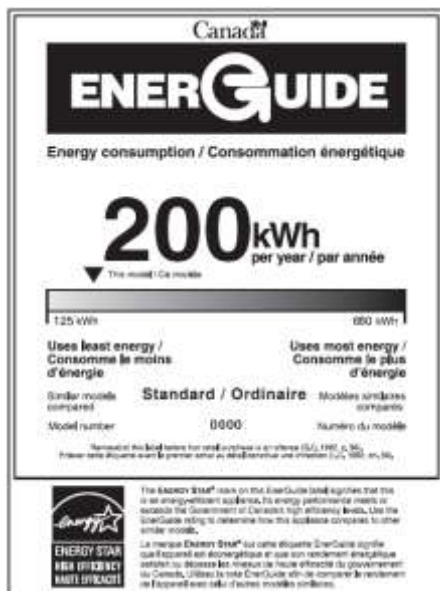
Section 5: Notes on Policy Interventions

5.1 Data Sources

- For information on the “Energy Efficiency Act”, the “Energy Efficiency Regulations”¹²
- For information on the “EnerGuide” Label on Laundry Appliances¹³

5.2 Mandatory Labelling: EnerGuide

The EnerGuide label on washing machines indicates how much electricity in kilowatt-hours (kWh) a particular model uses in one year and provides a indication of how the units performs in comparison with other units on the market. The EnerGuide label also incorporates the ENERGY STAR Mark for qualified products (as shown in the image below).



5.3 Voluntary Labelling: ENERGY STAR

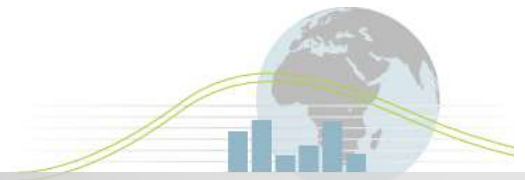
Voluntary Labelling: In 2001, Canada officially introduced ENERGY STAR. Washers and the washing component of integrated clothes washer/dryers that exceed the regulated performance standards by approximately 30% and use 35% to 50% less water than comparable models in the market are eligible for the ENERGY STAR label (refer to Notes Section 1.1.3 for performance requirements). See table below for the percentage of ENERGY STAR qualified products shipped in the Canadian market by year.

ENERGY STAR has also been integrated with the EnerGuide label to further enable consumers to identify the most energy efficient products.

¹² http://oee.nrcan.gc.ca/regulations/home_page.cfm

¹³ <http://oee.nrcan.gc.ca/publications/infosource/pub/appliances/2009/page3.cfm?attr=4>





Percentage of Total Shipments in Canada Qualifying for ENERGY STAR

	2003	2004	2005	2006	2007	2008	2009
Percentage of ENERGY STAR Products Shipped	24	35	42	45	56	64	69





Section 6: Notes on Cultural Issues

6.1 Data Sources

- Major Appliance Industry Trends and Forecast, Canadian Appliance Manufacturers Association, 2008 and 2009 (confidential)
- Energy Consumption of Major Household Appliances Shipped in Canada, Trends for 1990-2007, Natural Resources Canada, December 2009¹⁴

No additional notes

¹⁴ <http://oee.nrcan.gc.ca/Publications/statistics/cama09/index.cfm?attr=0>

