

REGULATORY IMPACT STATEMENT FOR HOUSEHOLD APPLIANCES

Prepared by:

Energy Efficiency Branch,
BC Ministry of Energy, Mines and Petroleum Resources
<http://www.empr.gov.bc.ca/EEC/Strategy/EEA/Pages/default.aspx>

September 2010

<p>Type of Device</p>	<p>Residential Refrigerators Residential Freezers Residential Dishwashers Residential Clothes Washers</p> <p>For all products covered by this proposed regulation, the regulated standard is fully harmonized with the AHAM-ACEEE Multi-Product Standards Agreement issued on July 30, 2010. Please visit http://www.aham.org/ht/a/GetDocumentAction/i/49956 for more information on the Agreement.</p>
<p>Proposed Energy Performance Standard</p> <p>Fridges & Freezers</p>	<p>Refrigerators and Freezers: Equivalent to AHAM-ACEEE Multi-Product Standards Agreement --see Appendix A for detailed description of performance standards for fridges and freezers</p>

**Proposed
Energy
Performance
Standard**

Dishwashers

Dishwashers:

Equivalent to AHAM-ACEEE Multi-Product Standards Agreement.

Performance Requirements

Type	Maximum TAEC ¹	Maximum WF ²
Standard ³	307 kWh/a	18.93 l/cycle (5.0 gal/cycle)
Compact ⁴	222 kWh/a	13.25 l/cycle (3.5 gal/cycle)

¹ TAEC: Total Annual Energy Consumption

² WF: Water Factor

³ defined as a dishwasher with a capacity equal to or greater than eight place settings plus six serving pieces

⁴ defined as a dishwasher that has a capacity less than eight place settings and six serving pieces

Test Standard

CAN/CSA -C373-04 Energy Consumption Test Methods and Limits for Household Dishwashers

<p>Proposed Energy Performance Standard</p> <p>Clothes Washers</p>	<p>Clothes Washers:</p> <p>Equivalent to AHAM-ACEEE Multi-Product Standards Agreement.</p> <p>Applies to standard-capacity clothes washer with a tub capacity of 45 l (1.6 ft³) or greater.</p> <p>Performance Requirements</p> <table border="1" data-bbox="457 489 1385 1104"> <thead> <tr> <th>Product Description</th> <th>Product Class</th> <th>Tier 1 (Jan 1, 2015)</th> <th>Tier 2 (Jan 1, 2018)</th> </tr> </thead> <tbody> <tr> <td>Top Loading, compact (less than 45 l (1.6 ft³ capacity))</td> <td>1</td> <td>MEF: 1.26 WF: 14.0</td> <td>MEF: 1.81 WF: 11.6</td> </tr> <tr> <td>Top-Loading, Standard</td> <td>2</td> <td>MEF: 1.72 WF: 8.0</td> <td>MEF: 2.0 WF:6.0</td> </tr> <tr> <td>Front-Loading, Standard</td> <td>4</td> <td colspan="2">MEF: 2.2 WF:4.5</td> </tr> <tr> <td>Front Loading, compact (less than 45 l (1.6 ft³ capacity))</td> <td>6</td> <td colspan="2">MEF: 1.72 WF:8.0</td> </tr> </tbody> </table> <p>MEF: Modified Energy Factor in L/kWh/cycle WF: Water Factor in gal/cycle/ft³</p> <p>Test Standard:</p> <p>CAN/CSA-C360-03 (R2009) - Energy Performance, Water Consumption and Capacity of Household Clothes Washers</p>	Product Description	Product Class	Tier 1 (Jan 1, 2015)	Tier 2 (Jan 1, 2018)	Top Loading, compact (less than 45 l (1.6 ft ³ capacity))	1	MEF: 1.26 WF: 14.0	MEF: 1.81 WF: 11.6	Top-Loading, Standard	2	MEF: 1.72 WF: 8.0	MEF: 2.0 WF:6.0	Front-Loading, Standard	4	MEF: 2.2 WF:4.5		Front Loading, compact (less than 45 l (1.6 ft ³ capacity))	6	MEF: 1.72 WF:8.0	
Product Description	Product Class	Tier 1 (Jan 1, 2015)	Tier 2 (Jan 1, 2018)																		
Top Loading, compact (less than 45 l (1.6 ft ³ capacity))	1	MEF: 1.26 WF: 14.0	MEF: 1.81 WF: 11.6																		
Top-Loading, Standard	2	MEF: 1.72 WF: 8.0	MEF: 2.0 WF:6.0																		
Front-Loading, Standard	4	MEF: 2.2 WF:4.5																			
Front Loading, compact (less than 45 l (1.6 ft ³ capacity))	6	MEF: 1.72 WF:8.0																			
<p>Effective Dates</p>	<p>Residential Refrigerators January 1, 2014</p> <p>Residential Freezers January 1, 2014</p> <p>Residential Dishwashers January 1, 2013</p> <p>Residential Clothes Washers January 1, 2015 (Tier 1), January 1, 2018 (Tier 2)</p>																				

Certification	CSA certification as noted in the “Proposed Energy Performance Standard” for each regulation above will be used to determine compliance with the regulation.
----------------------	--

Need for the Regulation	<p>The proposed regulation supports the updated 66% electricity conservation target for 2020, as set out in the <i>Clean Energy Act</i>, which received Royal Assent on June 3, 2010. 32% of the electricity savings target for the current BC Hydro Long-Term Acquisition Plan is achieved through codes and standards.</p> <p>If adopted, the new appliance efficiency standards would position BC as a leader in establishing a common North American standard on energy efficiency standards for household appliances. It will allow electrical utilities to offer incentives on even more efficient products to continue the market transformation of the household appliance sector.</p>
Transparent Regulation Development	<p>Development of regulation involved the following procedure:</p> <ul style="list-style-type: none"> • Identified targeted equipment and a potential standard • Identified test procedure • Market analysis • Economic assessment • Regulatory assessment <p>Formal stakeholder consultations will take place in September and October 2010, including written responses to regulatory impact statement and stakeholder feedback sessions to be scheduled as required.</p>
Market Transformation Strategy	<p>The provincial government had a Provincial Sales Tax exemption (7%) on ENERGY STAR qualified clothes washers, refrigerators and freezers to March 31, 2010.</p> <p>From January 15, 2008 to May 31, 2010, BC Hydro Power Smart offered a \$50 incentive to purchase ENERGY STAR refrigerators and clothes washers and a \$25 incentive to purchase ENERGY STAR freezers.</p> <p>As of June 1, 2010, BC Hydro Power Smart is offering incentives on select appliances that are more efficient than ENERGY STAR, as the standard ENERGY STAR products have achieved strong market penetration in British Columbia.</p> <p>Incentives include \$50 on super-efficient ENERGY STAR refrigerators and clothes washers and \$25 on super-efficient ENERGY STAR dishwashers. A \$25 incentive remains for all ENERGY STAR freezers. BC Hydro Power Smart has a refrigerator buy-back program, which will pick up fridges that are still in working condition. BC Hydro will pick up, recycle and give consumers \$30 for fridges that meet the program criteria.</p>

Assessment from an Industry Perspective

Range of products affected	See “Type of Device” heading for list of products covered by the proposed regulation.
Competitive Analysis	There are no manufacturers of the products covered by this regulation in British Columbia.
Market Share	<p>British Columbians have been leaders in choosing high-efficiency ENERGY STAR models in their appliance purchases. Current ENERGY STAR market share for individual products are a good predictor of future demand for appliances meeting the proposed regulated standards under the AHAM/ACEEE agreement. The percentages below represent the availability of in-store product that meets current ENERGY STAR standards, based on a BC Hydro market study completed in February 2010 (the 2009 results are in brackets to show the year-to-year trend).</p> <p>Fridge with Top freezer: 64% (43%), Fridge with Bottom Freezer: 83% (64%), Fridge with Freezer Unit Side-by-Side: 83% (70%) Freezers (upright): 55% (45%) Dishwashers: 92% (80%) Clothes Washers (Front): 91% (88%) Clothes Washers (Top): 64% (22%)¹</p> <p>Note: The AHAM/ASCEE agreement performance standards are above current ENERGY STAR levels. The Ministry does not have data on compliance with the AHAM/ASCEE agreement standards at this time.</p> <p>Source: BC Hydro Power Smart Tracking Study: Showroom Presence Study of Appliances and TVs, February 2010</p>
Waste Management	The Ministry of Environment is requiring province-wide recycling programs for all large appliances covered by the proposed regulation, effective July 1, 2012. For more information on B.C. recycling standards, visit http://www.env.gov.bc.ca/epd/recycling/electronics/index.htm .

¹ Note: The 22% of top load washers represented the amount of product that was labelled Energy Star compliant in the 2009 shelf study. The 2010 shelf study found that 47% of the product showed an Energy Star label but further research showed that 64% of the models displayed in the showroom are actually compliant. The 2009 study did not identify the number of actual compliant products. The jump from 22% to 64% may underestimate the true compliance level in 2009.

Cost Assessment from a Consumer Perspective

Criteria	Evaluation
Capital / purchase costs	<p>The proposed standards could increase the purchase cost of various white goods appliances compared to current prices for less efficient models which will be prohibited by the regulation, Estimated incremental costs are as follows:</p> <ul style="list-style-type: none"> • Clothes Washers (front load) \$198 • Clothes Washers (top load): \$231 • Refrigerators: \$60 • Freezers: \$50 • Dishwashers: \$84 <p>- If the US Department of Energy (DOE) formalizes the AHAM/ACEEE standards into law, as expected, the BC regulated standards and timelines will be harmonized with the US regulations, which will be established as the North American standard for major appliances. BC consumers will benefit from that market transformation and capital costs will be minimized due to competitive market pressures.</p> <p>The Ministry will monitor the DOE rulemaking process over the coming months. Should the AHAM standards be modified in the final rulemaking, Ministry staff will prepare corresponding changes to the B.C. standards to ensure harmonization.</p>

<p>Cost-Benefit Analysis</p> <p>Energy savings for each consumer</p>	<p>While British Columbia consumers would be subject to the same white good standards required across the United States, two of the four proposed products have a positive financial value for consumers over their lifetime, while two do not, based on current incremental capital cost estimates. However, it is expected that capital costs will decline due to economies of scale, increased competition for such products and North-American wide adoption of the standards. Also, projected increases in electricity and gas prices will increase the cost-efficiency for consumers. Utility incentives prior to the regulatory effective date will encourage consumers to adopt the standards before they are required.</p> <p>The following financial analysis was based on current incremental capital costs and electricity/natural gas rates.</p> <p>The analysis below is based on an electricity price of 6.8 cents/kWh in 2010, with rate increases as indicated in Budget 2010 and in the most recent BC Hydro long-term acquisition plan. All financial analysis is discounted at 8%.</p> <p>The results are as follows:</p> <p>Clothes Washers:</p> <ul style="list-style-type: none"> • Up to 164 kWh/year electricity savings; up to 1.124 GJ/year gas savings (from water heating) • Net present value (NPV) of \$-58.45 (front load washers); • Simple Payback of 15.1 years (note: the expected product life is 14 years) (front load washers) <p>Refrigerators:</p> <ul style="list-style-type: none"> • 92 kWh/year electricity savings • NPV of \$23.45 • Simple Payback of 7.5 years (note: the expected product life is 17 years) <p>Freezers:</p> <ul style="list-style-type: none"> • 99 kWh/year electricity savings • NPV of \$ 38.70 • Simple Payback of 5.8 years (note: the expected product life is 21 years) <p>Dishwashers:</p> <ul style="list-style-type: none"> • Up to 48 kWh/year electricity savings • Up to 0.05 GJ/year gas savings (from water heating) • NPV of \$ -39.78 • Simple Payback of 19.9 years (note: the expected product life is 13 years)
--	---

Assessment from a Provincial Government Perspective

Economic assessment from a provincial perspective
(Aggregate energy, emission and net cost savings)

The economic analysis considers the province-wide impact. In this case, the marginal cost of electricity supply was used, assumed to be 11 cents per kWh in 2010 plus a 2.5% per year escalator above normal inflation until 2018. The analysis assumes constant rates after 2018. The analysis is for the period between 2012 and the duration of the lifetime of each of the white goods appliances. The incremental capital cost of products is the same as those noted in the consumer impact assessment section.

The accumulated electricity and cost savings achieved in 2020 are shown below:

Proposed Regulations	Cumulative Electricity and Cost Savings in 2020
Clothes Washers	43 GWh/yr / \$16.3 M
Refrigerators	47 GWh/yr / \$21.9 M
Freezers	18 GWh/yr / \$8.3 M
Dishwashers	12 GWh/yr / \$6.2 M

The net present values (discounted financial value) to the province of the proposed standards are shown below. As noted in the previous heading, the NPV calculations below are based on current incremental appliance costs. They do not reflect expected cost reductions from continent-wide market transformation due to DOE standards for household appliances:

Proposed Regulations	Provincial NPV (millions)
Clothes Washers	\$-33.5
Refrigerators	\$22.0
Freezers	\$12.5
Dishwashers	\$-10.4

	<p>The proposed regulations will result in cumulative greenhouse gas (GHG) emissions reductions. The cumulative emissions savings in 2020 because of each of the regulations are shown below, assuming an emissions factor of 28 tonnes per GWh for electricity until 2016 and 0.05 tonnes per GJ natural gas:</p> <table border="1" data-bbox="518 409 1310 785"> <thead> <tr> <th data-bbox="521 411 971 512">Regulated Products</th> <th data-bbox="971 411 1307 512">Cumulative GHG Savings in 2020 (tonnes)</th> </tr> </thead> <tbody> <tr> <td data-bbox="521 512 971 579">Clothes Washers</td> <td data-bbox="971 512 1307 579">12,230</td> </tr> <tr> <td data-bbox="521 579 971 646">Refrigerators</td> <td data-bbox="971 579 1307 646">448</td> </tr> <tr> <td data-bbox="521 646 971 714">Freezers</td> <td data-bbox="971 646 1307 714">170</td> </tr> <tr> <td data-bbox="521 714 971 781">Dishwashers</td> <td data-bbox="971 714 1307 781">479</td> </tr> </tbody> </table> <p>Note that for clothes washers and dishwashers natural gas savings occur in households using natural gas for hot water supply. The impact on gas savings has been factored in to this analysis and results in significant GHG savings for clothes washers in particular.</p>	Regulated Products	Cumulative GHG Savings in 2020 (tonnes)	Clothes Washers	12,230	Refrigerators	448	Freezers	170	Dishwashers	479
Regulated Products	Cumulative GHG Savings in 2020 (tonnes)										
Clothes Washers	12,230										
Refrigerators	448										
Freezers	170										
Dishwashers	479										
<p>Regulatory Requirements Avoid or Eliminate Duplication with Other Jurisdictions</p>	<p>The proposed regulation was developed in discussions with the province of Ontario following the Ontario <i>Green Energy Act</i> introduction in February 2009, which initially aimed at proposed ENERGY STAR-level regulations for major appliances.</p> <p>To date, Ontario has not finalized its proposed regulatory standards for household appliances, but British Columbia will continue to work with Ontario and other provinces to encourage harmonization with the AHAM/ACEE appliance standards.</p>										
<p>Administrative Feasibility for Compliance and Enforcement</p>	<p>Compliance and enforcement approach under the <i>Energy Efficiency Act</i> is based on third-party verification, labelling of products and education of manufacturers, distributors, retailers and consumers with respect to energy efficiency standards and labelling requirements. All complaints of non-compliance are followed-up by Ministry staff, starting with industry education oriented materials. .</p> <p>As the proposed standards are harmonized with the expected US DOE standards derived from the recent AHAM/ACEE agreement, very high levels of compliance are expected with minimal resource requirements for enforcement.</p>										
<p>Regulatory Assessment Completed by</p>	<p>Erik Kaye, Senior Policy Advisor, Energy Efficiency Branch Tel: 250-356-1507 Email: Erik.Kaye@gov.bc.ca</p>										
<p>Date</p>	<p>September 2010</p>										

