Computers and Monitors Regulatory Impact Statement

REGULATORY PROPOSAL - REVISION 1 SEPT 5 2019

PREPARED BY:

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B.C. MINISTRY OF ENERGY, MINES AND PETROLEUM RESOURCES

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Contents:

SCOPE AND REQUIREMENTS

TYPE OF DEVICE	**"Computer"** means a device that performs logical operations and processes data. A computer includes both stationary and portable units and includes a desktop computer, a portable all-in-one, a notebook computer, a mobile gaming system, a high expandability computer, a small-scale server, a thin client, and a workstation. Although a computer is capable of using input devices and displays, such devices are not required to be included with the computer when the computer is shipped. A computer is composed of, at a minimum: (1) A central processing unit (CPU) to perform operations or, if no CPU is present, then the device must function as a client gateway to a server and the server acts as a computational CPU; (2) Ability to support user input devices such as a keyboard, mouse, or touchpad; and (3) An integrated display screen or the ability to support an external display screen to output information. The term "computer" does not include a tablet, a game console, a television, a small computer device, a server other than a small-scale server, or an industrial computer. **"Computer monitor"** means an analog or digital device of diagonal screen size greater than or equal to 17 inches and less than or equal to 61 inches, that has a pixel density of greater than 5,000 pixels per square inch, and that is designed primarily for the display of computer generated signals for viewing by one person in a desk-based environment. A computer monitor is composed of a display screen and associated electronics. A computer monitor does not include: (1) Displays with integrated or replaceable batteries designed to support primary operation without AC mains or external DC power (e.g., electronic readers, mobile phones, tablets, battery-powered digital picture frames); or (2) A television or a signage display.
TEST STANDARD	**Computers:** ENERGY STAR Program Requirements for Computers, Final Test Method Rev. March-2016 with the additional requirements described in California's Title 20 § 1604. Test Methods for Specific Appliances (v) (4). **Computer monitors:** ENERGY STAR Program Requirements for Displays, Final Test Method Rev. Sep-2015 with the additional requirements described in California's Title 20 § 1604. Test Methods for Specific Appliances (v) (5).

PROPOSED ENERGY PERFORMANCE STANDARD

Computers: The proposed energy performance standards for desktop computers, thin clients, mobile gaming systems, portable all-in-ones, notebook computers, small-scale servers and workstations is equivalent to the requirements set forth in California's Title 20 § 1605.3. (v) (5) and (6):

Computer Type	Tier 1	Tier 2
Desktop Computers, mobile gaming systems, and thin clients with an ES $\leq$ 250	50 kWh/yr + applicable adders	50 kWh/yr + applicable adders
Desktop Computers, mobile gaming systems, and thin clients with an 250 < ES $\leq$ 425	80 kWh/yr + applicable adders	60 kWh/yr + applicable adders
Desktop Computers, mobile gaming systems, and thin clients with an 425 < ES $\leq$ 690	100 kWh/yr + applicable adders	75 kWh/yr + applicable adders
Notebook computers and portable all-in-ones	30 kWh/yr + applicable adders	30 kWh/yr + applicable adders

The performance metric consists of a basic consumption allowance and applicable adders. Adders are additional consumption allowances (kWh/yr) for product features. The maximum consumption (kWh/yr) of a computer with many features will be higher (due to the inclusion of applicable adders) than a computer will only a few features. Applicable adders will be further defined in the regulation and will be equivalent to the adders set forth in California's Title 20 § 1605.3. (v) (5).

Computer Monitors: The proposed computer monitor standard requires that on-mode power draw shall be less than or equal to the following equation with each of the applicable allowances applied at most once. Applicable allowances will be further defined in the regulation and will be equivalent to the allowances set forth in California's Title 20 § 1605.3. (v) (4).

$E_{on} < (E_{on\_max} + E_{EP} + E_{Game} + E_{OLED} + E_{Curve})$

Where:

- E_{on} is the computer monitor on-mode power draw in watts;
- E_{on_max} is the maximum on-mode power draw in watts;
- E_{EP} is the enhanced performance display allowance in watts;
- E_{Game} is the gaming monitor allowance in watts;
- E_{OLED} is the OLED monitor allowance in watts; and
- E_{Curve} is the curved monitor allowance in watts.

EFFECTIVE DATE (UPDATED SEPTEMBER 5, 2019)	Regulated computers and monitors manufactured and sold after July 1, 2020. Regulated computers manufactured between July 1, 2020 and July 1, 2021 must comply with the Tier 1 performance standard. Regulated computers manufactured on or after July 1, 2021 must comply with the Tier 2 performance standard.
CERTIFICATION	Compliance with the proposed standard will be based on testing and verification by a certification body accredited by an International Accreditation Forum Multilateral Recognition Arrangement signatory to ISO/IEC 17065 which maintains an internet accessible product listing. No unique B.C. labeling will be required.
CURRENT STANDARD	The B.C. Energy Efficiency Standards Regulation currently does not have any requirements for computers or computer monitors.
HARMONIZATION	These proposed standards are harmonized with state regulations in California, Vermont, and recently passed legislation in Washington State. The standards became effective in California on January 1, 2019, and will become effective on January 1, 2020 and January 1, 2021 in Vermont and Washington, respectively.
NEED FOR REGULATION	Household electricity uses from personal electronics, including computers, has increased from 7 to 17 percent since the early 1990s in B.C. The trend of an increasing number of personal electronic devices and an increase in their use is expected to continue. Energy efficiency standards support B.C.'s energy objective in the *Clean Energy Act* to take demand-side measures and to conserve energy. The proposed standards reduce electricity costs for consumers and businesses. The standards will provide a positive economic return across most regulated products.
TRANSPARENT REGULATION DEVELOPMENT	Development of the proposed computers and monitors standard proceeded as follows: • Review of provincial climate and energy plans; • Market, economic and technical analysis; and • Development of a regulatory proposal. Public review and stakeholder consultation will be open for [45 days] after the publication of this document. Stakeholder consultation will be followed by regulatory drafting and submission of the regulatory proposal to Cabinet for approval.
ACCEPTANCE	The proposed standard will not create a significant change in the performance, interface or use of regulated products. Compliant products differ from non-compliant products by the addition of higher efficiency hardware components and by enhanced software. High-efficiency components are available at equivalent computer performance to incumbent technology. A large area of improvement is the computer's power consumption while idle, which has a negligible effect on product use. The performance metric for computers provides flexibility for more powerful computers to meet the standard. The performance metric for monitors accounts for screen size and resolution in order to provide flexibility for various product types to meet the standard.

MARKET TRANSFORMATION	Energy efficient computers and monitors have been promoted by the ENERGY STAR program since 1992. Hardware components and software enhancements developed to meet version 6 and 7 of the ENERGY STAR criteria (developed in 2014 and 2018) can be combined to meet the proposed standard.
AVAILABILITY	Computer and monitor manufacturers have developed a full spectrum of products to serve the California market. As of April 2019, the California Energy Commission's certified product directory showed 4,000 certified product families representing 45 manufacturing companies. The six major brands that represent 80% of the international market are all represented. B.C. is expected to have comparable product availability as California.

ASSESSMENT FROM AN INDUSTRY PERSPECTIVE

MANUFACTURER PERSPECTIVE	Computer manufacturers design products for global markets and seek to minimize differences in standards and classifications across different jurisdictions. The proposed B.C. standards are harmonized with California and Washington state, representing major west coast consumer markets.

ASSESSMENT FROM A CONSUMER PERSPECTIVE

COST-BENEFIT ASSUMPTIONS

A cost-benefit analysis was completed for products sold in B.C. Net Present Value (NPV) is used to represent the economic impact of the proposed standard on each product and weighs the benefits of the energy savings against the increased upfront cost over the life of the product.

Cost-benefit assumptions include:

- Weighted average BC Hydro electrical rates for residential and commercial buildings with forecasted rate increased between 2020 and 2040. Electrical rates include all applicable taxes and the rate rider.
- Incremental capital costs, energy consumption and product lifetime estimates derived from the California Energy Commission (CEC) Staff Report *Final analysis of Computers, Computer Monitors, and Signage Displays*.
- A consumer discount rate of 6%.

Estimated incremental purchase costs for various product types are shown in the table below:

Incremental Costs	
Desktops	Tier 1 - $12.13
	Tier 2 - $17.78

Notebook	$1.27
Small-scale Server	$16.51
Workstation	$16.51
Monitors	$6.35

COST-BENEFIT ANALYSIS

ENERGY SAVINGS FOR EACH CONSUMER

The NPV for various product types is shown below. A positive NPV shows a net benefit to the consumer.

NPV per product	
Desktops	Tier 1 $2.76
	Tier 2 $12.89
Notebook	$0.17
Small-scale Server	-$4.75
Workstation	$1.81
Monitors	$6.32

ASSESSMENT FROM A PROVINCIAL GOVERNMENT PERSPECTIVE

ECONOMIC ASSESSMENT FROM A PROVINCIAL PERSPECTIVE

(Aggregate energy, emission and net cost savings)

A cost benefit analysis was completed to assess the impact of the proposed standard on computer and monitor sales in the Province between 2020 and 2030. The Provincial cost benefit assumptions include:

- All assumptions made in the consumer cost-benefit analysis.
- A forecast of future shipments based on product replacement rates from the CEC staff report, provincial housing starts and historical stock of computing appliances per residential and commercial electricity account.

The Province-wide cost-benefits results are shown below:

Provincial Cost-Benefit Analysis	
Aggregated Annual Electrical Savings[1]	150 GWh in 2030
Provincial NPV	$60 Million by 2030

[1] The aggregated annual energy savings accounts for the energy savings that occur from all units installed since the implementation of the standard up to the year specified.

ADMINISTRATIVE FEASIBILITY FOR COMPLIANCE AND ENFORCEMENT	The compliance and enforcement approach under the *Energy Efficiency Act* is based on random inspections and response to compliance complaints. The certification body's internet accessible product listing will be used to determine product compliance.

NOTES

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