2024 Annual Report

Canadian Energy Efficiency Voluntary Agreement for Set-Top Boxes and Small Network Equipment

D+R International

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EXECUTIVE SUMMARY

The Canadian Energy Efficiency Voluntary Agreements ("CEEVA") are a collaboration between the largest Internet and Pay TV service providers and consumer electronics manufacturers, in consultation with Natural Resources Canada (NRCan), to improve the energy efficiency of the set-top boxes ("STB") that consumers use to access video services and the modems and routers (small network equipment, or "SNE") they use to access Internet service. The primary objective of the CEEVA STB[1] and CEEVA SNE[2] programs is to improve the energy efficiency of set-top boxes and small network equipment while promoting innovation and introduction of new features without compromising the customer experience.

The core commitment of each program is that 90% of new devices purchased by each signatory each year meet efficiency levels prescribed by each CEEVA agreement. In addition to procuring energy-efficient devices, the signatories provide public access to information about the energy consumption characteristics of reported devices.

The Data Aggregator, D+R International (D+R), oversees these commitments while continuing to monitor the effectiveness of CEEVA year-over-year, including through the publication of this Annual Report.

In 2024, 100% of all new set-top boxes procured met the efficiency levels specified in the agreement. In the seven years since the agreement's set-top box commitments initiated, the weighted average energy consumption for new set-top boxes has declined by 74%, as shown in Figure 1 below. These conclusions are based on 2024 procurement data and the results of independent testing and auditing described in this report.

Figure 1: Weighted Average Energy Consumption of Purchased Set-Top Boxes
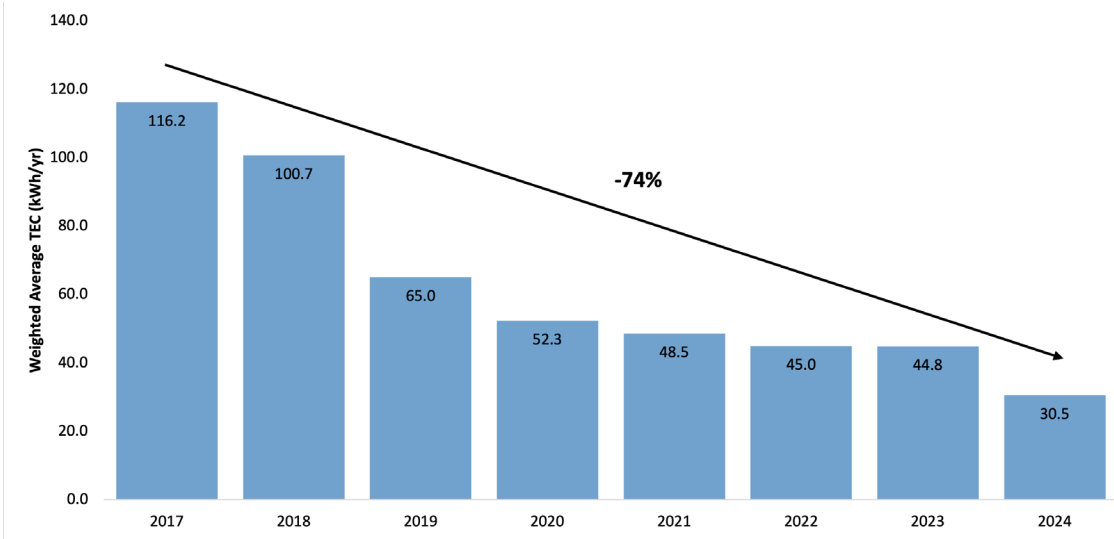
For the fourth consecutive year, each service provider signatory reported that 100% of its new SNE purchases in 2024 met the applicable efficiency levels. The efficiency of SNE relative to their capability has increased since 2020. As shown in Figure 2, the weighted average power of new SNE devices purchased each year has decreased by 64% relative to broadband download speeds since SNE reporting began in 2020.

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[1] Canadian Energy Efficiency Voluntary Agreement for Set-Top Boxes (CEEVA STB), available
at https://www.energyefficiency-va.ca/wp-content/uploads/2024/06/CEEVA-STB-as-Amended-Sep-2021-updated-2024_06_05.pdf
[2] Canadian Energy Efficiency Voluntary Agreement for Small Network Equipment (CEEVA SNE),
available at https://www.energyefficiency-va.ca/wp-content/uploads/2024/06/CEEVA-SNE-Amendment-Effective-2022_01_01-updated-2024_06_05.pdf

Figure 2: Weighted Average Energy Usage of New SNE, Relative to Broadband Download Speed 2020-2024
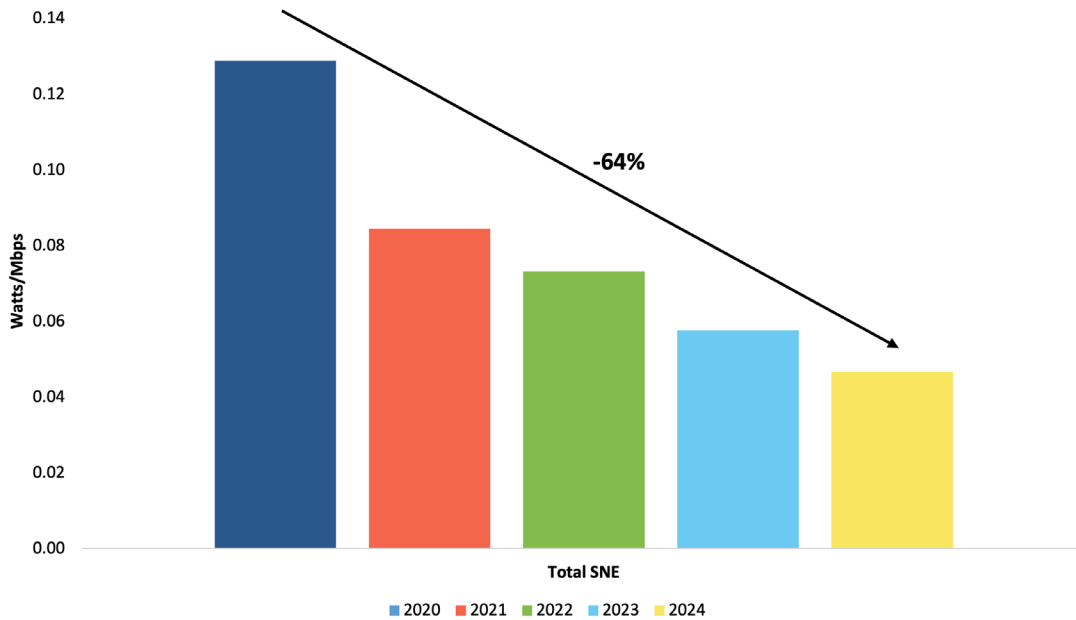
These figures were calculated by dividing the weighted average Ready State power of each equipment type as verified by D+R in this report by the fixed mean broadband download speed in Canada reported by Ookla.

OVERVIEW OF CEEVA

CEEVA Objective

The primary objective of CEEVA is to encourage deployment of energy-efficient set-top boxes and small network equipment while supporting advances in rapidly changing technologies and the enhancement of customer experience. By achieving this objective, CEEVA aims to reduce Canada's carbon footprint in a manner that supports innovation and the provision of high-quality service to meet customers' demands.

Given the nature of the North American consumer electronics market, CEEVA generally employs the same technical standards and test methods used in similar voluntary agreement programs in the United States,[3] coupled with provisions specific to Canada - including terms for the active participation of NRCan.

CEEVA Signatories and Steering Committee

CEEVA signatories and participants are listed below. Each signatory and non-signatory member listed has representation on the Steering Committee.

Service Provider Signatories

- Bell Canada
- Cogeco
- Rogers Communications
- TELUS
- Videotron

[3] Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes and Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Small Network Equipment, https://energy-efficiency.us/

Manufacturer Signatories

- EchoStar Technologies LLC (CEEVA STB only)
- Vantiva

Non-Signatory Members of the Steering Committee

- Natural Resources Canada (NRCan)
- CableLabs®
- Consumer Technology Association® (CTA®)

The Steering Committee was established to discuss, review, and coordinate both CEEVA agreements. Its purpose includes ensuring that the following goals of CEEVA are met:

- Guaranteeing Canada-focused agreements that take into account the North American marketplace for set-top boxes and SNE;
- Creating a simplified, transparent, and accountable process for evaluating and reporting energy consumption and compliance with energy-efficiency commitments;
- Supporting a consensus approach to decision making; and,
- Promoting innovation and avoiding disruption of Canadian consumers and the Canadian market for video and broadband services.

Additionally, the Steering Committee selects the Data Aggregator responsible for compiling and reporting data from each signatory and publishing the annual reports. D+R was appointed as the Data Aggregator for CEEVA STB in 2017 and has continued in this role in 2024, serving as the Data Aggregator for both CEEVA STB and CEEVA SNE.

Energy Efficiency Commitments

The service providers' primary commitment is that 90% of each of the new set-top boxes and small network equipment devices they receive each year will meet energy efficiency levels prescribed by CEEVA. CEEVA aligns with the energy level values used in similar voluntary agreement programs in the United States for each of these types of devices. These levels are continuously reviewed for potential improvements to reflect market and technology developments and are periodically revised through new more energy-efficient "tiers."

Data Aggregator Role

The Data Aggregator is a third-party organization selected by the Steering Committee. Pursuant to CEEVA, the Data Aggregator must aggregate and analyze confidential procurement data submitted by the service provider signatories to determine satisfaction of the CEEVA commitments. Additionally, this role includes verifying the test results of each set-top box and SNE reported by service providers. If any of the commitments are not met, the Data Aggregator initiates a remedial process following the procedures set forth in CEEVA.

In addition to aggregating and analyzing the annual data submissions from each signatory, the Data Aggregator is also tasked with auditing one randomly selected service provider's procurement figures each year for each program. The successful results of the 2024 audits are summarized in Appendix D.

New Feature Allowances

To keep pace with fast-changing technologies and consumer demands, CEEVA includes a process that enables parties to develop and deploy set-top boxes and SNE with new energy-consuming features without seeking advance approval of a new energy allowance for that feature. Without this flexibility, innovation and competition could be stifled, and consumers could face delays in obtaining new features and services, while providers would be deprived of first-mover advantages in bringing new capabilities to market.

If a service provider deploys a set-top box or SNE that includes a new feature without an allowance and the applicable Tier levels are exceeded, it may set and report an appropriate initial allowance for the power consumption of said feature when reporting the device. The Steering Committee will review the proposals to set a new allowance for that feature within six months. No new feature allowances were reported for STBs or SNE in 2024.

CEEVA STB

Canadian Pay TV providers deliver traditional television service to approximately 8.91 million households.[4] Set-top boxes are used to deliver encrypted television programming, program guides, Personal Video Recorders (PVRs), and multi-room viewing to enhance the customer experience. Set-top boxes vary among service providers and include both hardware components and software programming which are updated frequently to deliver the newest services to customers.

To help improve the energy efficiency of set-top boxes, five of the largest Pay TV service providers, manufacturers of set-top boxes, and other supporting organizations participate in CEEVA STB. Past CEEVA Annual Reports have classified set-top boxes into two categories:

- **Personal Video Recorders (PVRs):** Set-top boxes with features that enable recording and playback of video content from a local hard disk drive or other local storage.
- **Non-PVRs:** Set-top boxes that do not include a local hard disk drive or other local storage for recording and playback of video content.

However, for the first time under CEEVA, the service providers only purchased Non-PVRs in 2024.

Set-Top Box Market Coverage

The signatories established the objective that CEEVA STB cover at least 85% of the residential Canadian Pay TV market. In 2024, the signatories served approximately 8.5 million subscribers, accounting for approximately 96% of the total residential Pay TV market.

Set-Top Boxes Covered

This report covers all new set-top boxes received by service provider signatories in 2024.

Set-Top Box Testing

To demonstrate that the set-top boxes purchased by service provider signatories met the applicable efficiency levels, CEEVA STB requires all set-top boxes to be tested independently by a Steering Committee-approved organization with ISO 17065 or 17025 accreditation and/or recognized by the Standards Council of Canada for set-top box testing. The tests must be conducted running the service provider's software as it is normally installed for an end user.

For the 2024 reporting year, all service provider signatories submitted their accredited third-party testing results to the Data Aggregator. The Data Aggregator verified the test results and energy consumption values against the reported values and Tier 3 requirements. All models tested at or below the energy consumption values reported by signatories.

Set-Top Box Service Provider Commitments

The service providers' primary commitment under CEEVA STB in 2024 is that 90% of the new set-top boxes that each signatory receives each year will meet CEEVA STB's Tier 3 energy-efficiency levels. For set-top boxes, the Tier 3 levels became applicable to purchases effective January 1, 2023. An even more rigorous set of Tier 4 allowances became applicable on January 1, 2025 and will be used to measure performance in the next Annual Report. Tier 4 emphasizes further improvement to the IP non-PVR set-top box category that is expected to represent an increasing majority of new devices in the future.

The service providers have also committed to provide information to consumers about the general energy consumption characteristics of set-top boxes that they receive, and to monitor and ensure the ongoing effectiveness of CEEVA STB by reviewing its terms annually.

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[4] Total subscriber count was taken as of Q4 2024, based on data from the Canadian Radio-television and Telecommunications Commission, available at https://crtc.gc.ca/eng/publications/reports/PolicyMonitoring.

Report on Set-Top Box Procurement

100% of set-top boxes received by each service provider met Tier 3 levels in 2024, up from 92.4% in 2023. 2024 was the second year Tier 3 procurement commitments were in effect.

Table 1 shows the number of set-top boxes received by service providers and the percentage that met the applicable efficiency levels in 2024.

Table 1: Received Set-Top Box Units by Category 2024

Category	2024	
	Received Units	Percentage of Units Meeting Tier 3 Levels
Non-PVRs	1,231,203	100%
Total	1,231,203	100%

Set-Top Box Energy-Efficiency Trends and Baseline

The weighted average Typical Energy Consumption[5] (TEC) for new set-top boxes received by the service provider signatories in 2024 was 30.4 kWh/year, declining by 32% from 2023 and by 74% compared to the weighted averaged TEC in 2017, the baseline established by CEEVA STB for measuring energy- efficiency trends. This decline, illustrated in Table 2 below and Figure 1 in the Executive Summary, is particularly noteworthy given customers' continued demand for increased functionality in these devices.

Table 2: Weighted Average TEC of New Set-Top Boxes, by Category 2017-2024[6]

Category	Weighted Average TEC (kWh/yr)								Percent Change							
	2017	2018	2019	2020	2021	2022	2023	2024	2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	2022-2023	2023-2024	2017-2024
PVRs	156.4	145.1	127.8	121.4	115.6	122.5	110.0	N/A	-7%	-12%	-5%	-5%	6%	-10%	N/A	-30%
Non-PVRs	85.2	65.7	44.4	41.5	37.7	32.8	39.2	30.5	-23%	-32%	-6%	-9%	-13%	19%	-22%	-64%
Total Set-Top Boxes	116.2	100.7	65.0	52.3	48.5	45.0	44.8	30.5	-13%	-35%	-19%	-7%	-7%	0%	-32%	-74%

These savings are driven in part by the decline over the five years in the procurement of PVRs, which generally consume more energy than Non-PVR devices. Service providers have deployed whole-home architectures that enable customers to view recorded content throughout their home using a single PVR, and many have deployed cloud-based services that enable customers to record and view recorded content without any PVR at all. The impact of the growth of these innovative offerings is illustrated in Table 3, below, which demonstrates the increase in Non-PVRs and decrease in PVRs as a percentage of total new set-top boxes received each year from a nearly even distribution to a distribution dominated by Non-PVRs. In 2024, 100% of all new set-top box purchases were Non-PVRs.

Table 3: Percentage of Set-Top Boxes Received by Category 2017-2024

Category/Received Units	2017	2018	2019	2020	2021	2022	2023	2024
PVRs	44%	44%	25%	13%	14%	14%	8%	0%
Non-PVRs	56%	56%	75%	87%	86%	86%	92%	100%

In summary, the improved energy efficiency of models and the shift to a greater proportion of lower-powered models have combined to dramatically reduce the overall energy usage of new set-top box purchases.

[5] TEC is the product of a method for evaluating energy consumption through a calculation of the expected typical energy consumption for a specific model of set-top box during a one-year period, expressed in units of kWh/year.
[6] Since no PVRs were purchased by the service providers in 2024, the percent change from 2017-2023 is represented in the 2017-2024 column for PVRs.

CEEVA SNE

The service provider signatories provided wired broadband Internet services to approximately 13.6 million Canadian residential customers. The service provider signatories each committed that 90% of their new modems, routers, and other SNE used to serve these customers meet prescribed efficiency levels beginning January 1, 2021. In the first three years that these commitments were in effect, 100% of the new units received by the service provider signatories in 2021 2022, and 2023 met CEEVA SNE's Tier 2 efficiency levels. In 2024, the first year Tier 3 levels were in effect, 100% of the new units met the updated Tier 3 efficiency levels.

Small Network Equipment Covered

CEEVA classifies SNE into three categories:

- **Broadband Modems:** Simple network devices that enable high-speed data service with a Wide Area Network (WAN) interface to a service provider wired or optical network, and typically a single Local Area Network (LAN) interface for the customer premise network. The Broadband Modem category does not include devices with integrated router or IEEE 802.11 (Wi-Fi) wireless access point functionality.
- **Integrated Access Devices (IADs):** Broadband network devices include a WAN interface to a service provider wired or optical network, and one or more of the following functions on the LAN interface: multiport routing, Wi-Fi wireless access point functionality, and/or Voice over Internet Protocol (VoIP).
- **Local Network Equipment (LNE):** Devices that do not have a direct interface to a service provider wired or optical network. This category consists of routers, wireless access points, switches, and network extenders that bridge or extend a LAN beyond its physical limitations.[7]

The commitment effective date for CEEVA SNE was January 1, 2021. All new SNE received by service provider signatories after the commitment effective date are covered. This is the fourth Annual Report in which the procurement commitments are in effect.

Small Network Equipment Testing

Products procured after January 1, 2021, are required to be tested by a Steering Committee-approved organization with ISO 17065 or 17025 accreditation and/or recognized by the Standards Council of Canada for SNE testing. Devices are tested in the "Ready State" in accordance with the ANSI/CTA-2049-B test method. In 2024, the test results were verified to be consistent with the reported power levels for all models tested.

Small Network Equipment Service Provider Commitments

The service providers' primary commitment under CEEVA SNE is that 90% of the new devices that each signatory receives each year will meet CEEVA SNE's energy-efficiency levels. Service providers have also committed to inform consumers about the general energy consumption characteristics of SNE that they receive and to take reasonable steps to monitor the effectiveness of CEEVA SNE by reviewing its terms annually.

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[7] Definitions of these categories are provided in Annex A of CEEVA
SNE, https://www.energyefficiency-va.ca/wp-content/uploads/2024/06/CEEVA-SNE-Amendment-Effective-2022_01_01-updated-2024_06_05.pdf.

Report on Small Network Equipment Procurement

In 2024, 100% of new SNE purchased by the service provider signatories met the CEEVA SNE Tier 3 energy-efficiency levels, as shown in Table 4 below.

Table 4: Total Units Received in 2024 and Number Meeting Energy-Efficiency Levels, by Small Network Equipment Type

Year	2024		
Category	Received Units	Number of Units Meeting Tier 3 Levels	Percentage of Units Meeting Tier 3 Levels
IADs	2,214,875	2,214,875	100.0%
LNE	881,572	881,572	100.0%
Total	3,096,447	3,096,447	100.0%

IADs represent 72% of reported products and LNE represents 28%. There were a small number of broadband modems reported in 2024 by one service provider, but they were merged into the IAD category to maintain confidentiality. Figure 3 shows the category breakdown, by percentage, of the units purchased.

Figure 3: Small Network Equipment, by Equipment Type
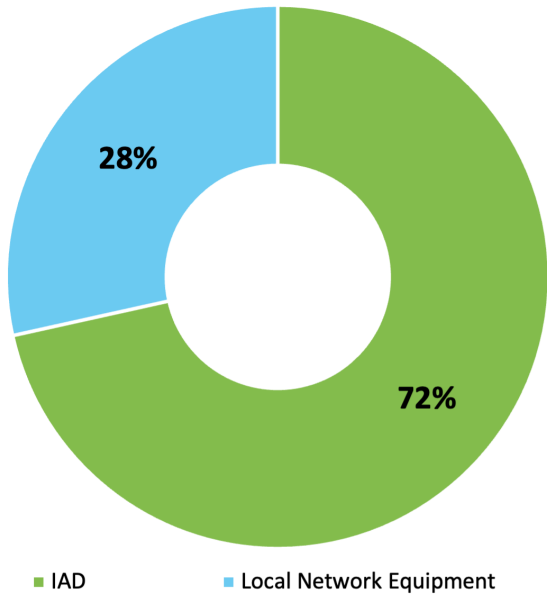
Small Network Equipment Energy Efficiency

While the weighted average power of set-top boxes has sharply declined under CEEVA, securing absolute energy reductions for SNE is more challenging as consumers increasingly demand support for faster Internet speeds and stronger Wi-Fi signals that require additional power in SNE. Nonetheless, the total weighted average power of new SNE declined by 19% from 2020 to 2024. Details of the new SNE received by the service provider signatories in 2024 are provided in Appendix B. The energy efficiency of each model is assessed based on its particular suite of functions and capabilities, which vary widely. The weighted average power of each of the categories reported for CEEVA SNE is shown in Table 5 below.

Table 5: Weighted Average Ready State Power Consumption for Small Network Equipment Purchased in 2020-2024

SNE Category	Weighted Average Power (in Watts)				
	2020	**2021**	**2022**	**2023**	**2024**
IADs	20.46	17.85	17.13	16.37	14.98
LNE	4.30	6.23	6.75	8.02	9.17
Total Weighted Average	**16.44**	**15.06**	**15.61**	**14.72**	**13.32**

It is difficult to make useful comparisons in the absolute power used by SNE devices over time because the devices are highly varied (even within the categories) and, as noted above, SNE devices change significantly over time to support increases in consumer demand for speed and Wi-Fi signal strength. For that reason, these reports have evaluated the efficiency of SNE products relative to their capability. Average fixed consumer broadband speeds in Canada have increased by 124% from 2020 to 2024, as shown in Figure 4. Support for these higher speeds and better in-home Wi-Fi coverage requires more energy. Moreover, new SNE is designed to be capable of supporting the even greater demands anticipated in the future over the expected lifespan of devices.

Figure 4: Average Fixed Broadband Download Internet Speed 2020-2024[8]
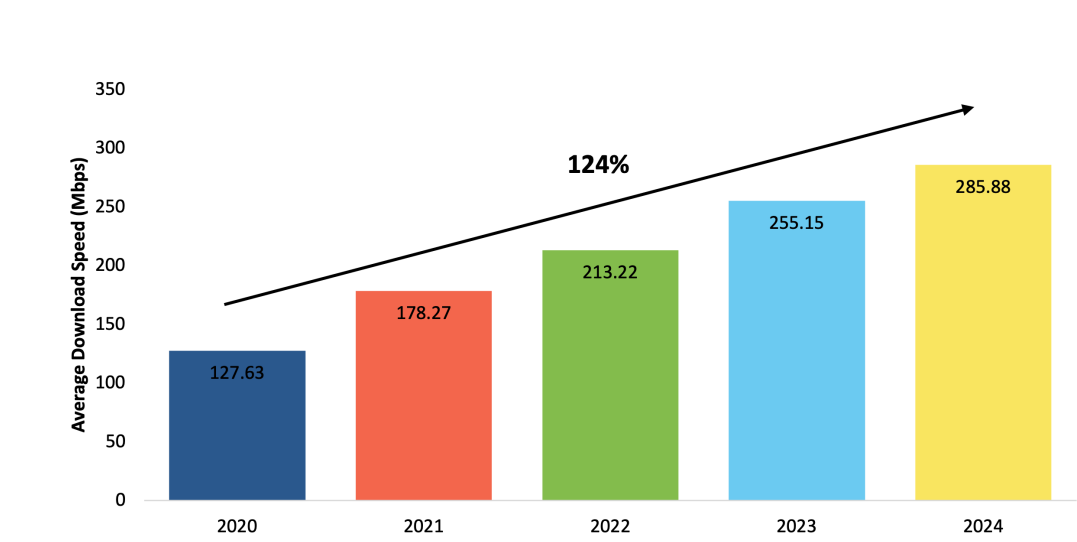
The weighted average power of new SNE relative to broadband speed delivered has decreased by 64% from 2020 to 2024, as shown in Figure 2 in the Executive Summary. Figure 5 demonstrates the relative stability of the SNE power consumption compared to the increase in average download speeds over the four years of CEEVA SNE. This report finds that the signatories are delivering SNE functionalities more efficiently. Future reports will monitor this trend and evaluate its impact on SNE energy usage and efficiency.

[8] Ookla, Speedtest® data for fixed broadband speeds

Figure 5: Weighted Average Power of Small Network Equipment Devices vs. Average Download Speed 2020-2024
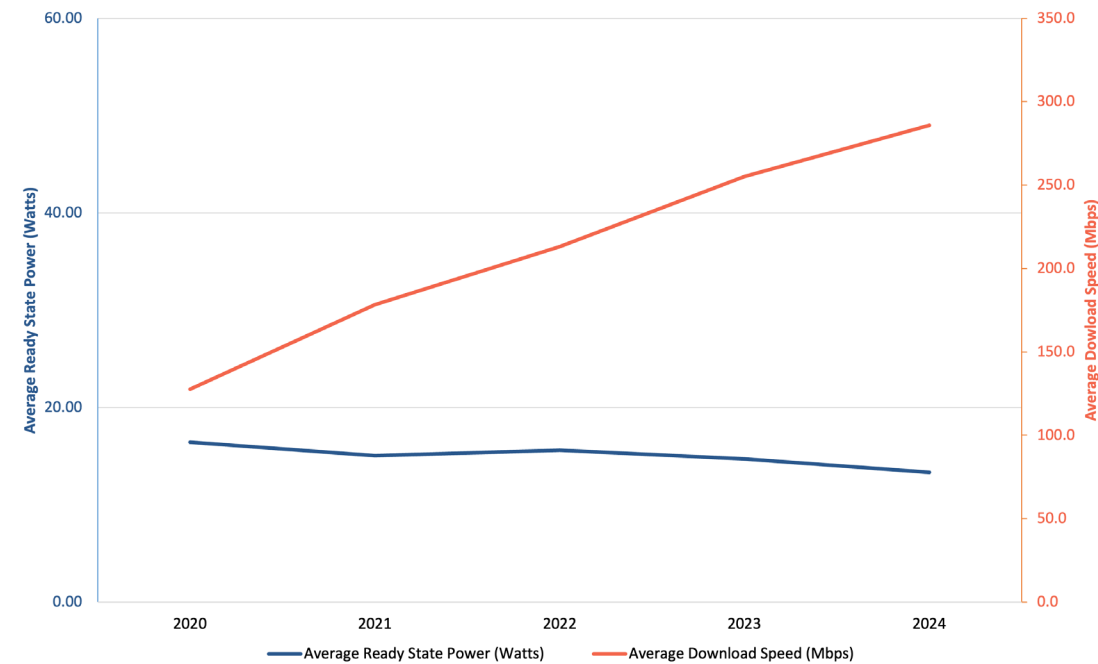
ENERGY-EFFICIENCY INFORMATION FOR CONSUMERS

All service provider signatories committed to provide their subscribers and prospective customers with reasonable access to energy-efficiency information about reported set-top boxes and small network equipment. This information allows consumers to learn about their options for energy-efficient devices. Links to this information are shown in Appendix C and posted online at www.energyefficiency-va.ca.

CONCLUSION

CEEVA continued to achieve success in 2024. The weighted average energy use of new set-top boxes has declined by 74% since 2017 and the energy efficiency of new SNE devices has improved by 64% since 2020. 100% of new set-top boxes and 100% of new SNE met the applicable program energy levels in 2024. D+R will continue to monitor progress and developments for both set-top box and SNE energy efficiency in future reports.

APPENDIX A: TIER 3 SET-TOP BOXES RECEIVED IN 2024 BY SERVICE PROVIDER SIGNATORIES

Table 6 lists the reported TEC for new Tier 3 set-top box models received by CEEVA STB service provider signatories in 2024. These values are reported TEC, rather than calculated TEC. In CEEVA STB, service providers have the option to publish a "reported TEC" that rounds up calculated TEC values for reporting purposes to account for production variances. Modal power and reported TEC figures in this Appendix are rounded up to the next one-tenth digit (e.g., 99.11 kWh/year would be rounded up to 99.2 kWh/year). Please note that the same model could have variances in TEC for several reasons, including differences in reported versus calculated TEC, enabling of different product features, and/or deployment of the device by service providers running different software. CEEVA STB calculates maximum allowable TEC for a product using the base-type allowances outlined in Table 7 and the feature allowances outlined in Table 8. Table 8 also includes descriptions of the features abbreviated in Table 6 in the "Claimed Allowances" column. CEEVA STB sets forth rules for how to claim feature allowances, so the column for claimed allowances lists only the features used when calculating the maximum allowable TEC for the specific product to qualify toward meeting the signatory's commitment.

Table 6: Tier 3 Set-Top Boxes Received by Service Provider Signatories in 2024

Service Provider	Base Type	Primary Function	Manufacturer	Model No.	Claimed Allowances	On	Sleep	TEC (kWh/yr)
Bell	Satellite	Non-PRV	DISH Technologies	6500	APD (hrs), HEVP	7.3	7.1	63.0
Bell	Satellite	Non-PRV	DISH Technologies	7500	APD (hrs), HNI, M-HNI, HEVP	5.4	5.1	46.0
Bell	IP	Non-PRV	CommScope	7802	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP, UHD-4	4.3	2.7	33.0
TELUS	IP	Non-PRV	Vantiva	UIW4054LTU	WiFi (n) LP, WiFi (ac) LP, HEVP, UHD-4	4.1	3.1	40.0
Cogeco	IP	Non-PRV	ARRIS	DIW3930	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP, UHD-4	4.0	2.4	32.0
Rogers	IP	Non-PRV	Sagemcom	WNXI11AEI	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP	3.4	2.9	30.0
Rogers	IP	Non-PRV	ARRIS	SCXI11BEI	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP	3.8	2.2	30.0
Videotron	IP	Non-PRV	ARRIS	WNXI11AEI	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP, UHD-4	4.1	2.5	32.0
Videotron	IP	Non-PRV	Sercomm	SCXI11BEI	HNI, WiFi (n) LP, WiFi (ac) LP, HEVP, UHD-4	3.8	2.3	30.0

Table 7 lists the base type and allowances (kWh/year) for set-top boxes received in 2024 shown in Table 6.

Table 7: Set-Top Box Base Allowances

Base Type	Tier 3 Allowance (kWh/yr)
Internet Protocol (IP)	40
Satellite	55

Table 8 lists the features, feature descriptions, and allowances (kWh/year) for set-top boxes received in 2024 shown in Table 6.

Table 8: Set-Top Box Feature Allowances

Feature	Description	Tier 3 Allowance (kWh/yr)
APD	Automatic Power Down (4hrs)	-
HEVP	High Efficiency Video Processing	10
HNI	Home Network Interface	10
M-HNI	MoCA HNI	12
Wi-Fi(n) LP	Wi-Fi IEEE 802.11n radio at 2.4 GHz or at 5.0 GHz	9
WiFi(ac) LP	Wi-Fi, IEEE 802.11ac radio at 5 GHz	19
UHD-4	Ultra High Definition - 4K	5

APPENDIX B: TIER 3 SMALL NETWORK EQUIPMENT RECEIVED IN 2024 BY SERVICE PROVIDER SIGNATORIES

Appendix B lists the Tier 3 SNE reported by the service provider signatories in 2024. Note that the same model deployed by different signatories could have variances in reported power for several reasons, including differences in reported versus measured power, enabling of different product features, and/or different software deployed on the device. Modal power figures in this Appendix are rounded up to the next one-hundredth digit (e.g., 5.126 watts would be rounded up to 5.13 watts). CEEVA SNE calculates maximum allowable Ready State power for a product using the base and feature allowances listed in Table 10, which includes descriptions of the features abbreviated in Table 9 in the "Claimed Allowances" column. CEEVA SNE sets forth rules for how to claim feature allowances, so the column for claimed allowances lists only the features used when calculating the maximum allowable Ready State power for the specific product to qualify toward meeting the signatory's commitment.

Table 9: Tier 3 Small Network Equipment Received by Service Provider Signatories in 2024

Signatory	Manufacturer	Model Number	Base Type	Claimed Allowances	Reported Ready State Power (W)
Bell	Sagemcom	Pods Gen 3	Basic LNE	GigE LAN(2), 2.4 GHz Radio LP, 5 GHz Radio (20, 40, 80 MHz) LP(2), 5 GHz MIMO (20, 40, 80 MHz) above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe Gen 1 & 2 Base(3)	6.50
Bell	Sagemcom	Pods Gen 4	Advanced LNE	GigE LAN, 2.5 GigE LAN, 2.4 GHz Radio LP, 5 GHz Radio (160 MHz) LP, 5 GHz MIMO (160 MHz) above 2x2 LP(2), 6 GHz Radio (160 MHz) LP, 6 GHz MIMO (160 MHz) above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe Gen 1 & 2 Base(3), AP 5K-10K DMIPS	10.50
Bell	Sagemcom	Fast5689e	IAD 10G EPON	GigE LAN(4), 10 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, FXS(2), USB 3, Z-wave, 802.15.4, PCIe Gen 1 & 2 Base(3)	15.00
Cogeco	Sagemcom	5681V	IAD 10G EPON	GigE LAN(2), FXS(2)	6.00
Cogeco	AdTran	SDG 854-6	Advanced LNE	GigE LAN(4), 2.5 GigE LAN Active, 2.4 GHz Radio LP, 2.4 GHz MIMO above 2x2 LP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth	10.80
Cogeco	AdTran	SDG 841-t6	Basic LNE	GigE LAN, 2.5 GigE LAN Active, 2.4 GHz Radio LP, 2.4 GHz MIMO above 2x2 LP(2), 5 GHz Radio (20, 40, 80 MHz) LP, 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth	9.50
Cogeco	Sagemcom	F@st 3896SU	IAD D3.1	GigE LAN, 2.5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, FXS(2)	14.50
Rogers	Hitron	CODA-5810	IAD D3.1	GigE LAN(2), 2.5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe Gen 1 & 2 Base(2), AP 5K-10K DMIPS	21.80
Rogers	Vantiva	CGM4981COM	IAD D3.1	GigE LAN(3), 2.5 GigE LAN Active, 6 GHz Radio (20, 40, 80 MHz) LP, 6 GHz MIMO (20, 40, 80 MHz) above 2x2 LP(2), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, FXS(2), USB 2, Bluetooth, 802.15.4, PCIe Gen 1 & 2 Base(2), AP 5K-10K DMIPS	17.50
Rogers	Sagemcom	XE2-SG	Basic LNE	GigE LAN(2), 2.4 GHz Radio LP, 2.4 GHz MIMO above 2x2 LP(2), 5 GHz Radio (20, 40, 80 MHz) LP(2), 802.11n 256 QAM, Bluetooth, PCIe Gen 1 & 2 Base(3)	6.50
TELUS	Nokia	G-204G	IAD Fiber WAN	GigE LAN, FXS(2)	4.00
TELUS	Nokia	XS-250X-A	IAD Fiber WAN	10 GigE LAN Active, FXS(2)	8.50
TELUS	Vantiva	FXA5000TLU (XGS PON)	IAD 10GB PON	GigE LAN(4), 10 GigE LAN Active, MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	9.00
TELUS	Vantiva	FXA5000TLU (GPON)	IAD SFP GPON	GigE LAN(4), 10 GigE LAN Active, MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	10.00
TELUS	Vantiva	FXA5000TLU (10 GigE)	IAD 10 GigE	GigE LAN(4), MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	8.00
TELUS	Arcadyan	NH20T (XGS PON)	IAD 10GB PON	GigE LAN(4), 10 GigE LAN Active, MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	9.00
TELUS	Arcadyan	NH20T (GPON)	IAD SFP GPON	GigE LAN(4), 10 GigE LAN Active, MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	10.20
TELUS	Arcadyan	NH20T (10 GigE)	IAD 10 GigE	GigE LAN(4), MoCA, FXS(2), USB 3, AP 5K-10K DMIPS	8.00
TELUS	Vantiva	EWH1350TLU	Advanced LNE	GigE LAN(2), 2.5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (160 MHz) HP(2), 5 GHz MIMO (160 MHz) above 2x2 HP(4), MoCA, Bluetooth, Z-wave, PCIe Gen 3 Base(3), AP 5K-10K DMIPS	12.00
TELUS	Vantiva	EWA222TTLU	Advanced LNE	GigE LAN, 2.5 GigE LAN Active, 5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (160 MHz) HP, 5 GHz MIMO (160 MHz) above 2x2 HP(2), 6 GHz Radio (160 MHz) HP, 6 GHz MIMO (160 MHz) above 2x2 HP(2), MoCA, Bluetooth, Z-wave, PCIe Gen 3 Base(2), AP 5K-10K DMIPS	14.00
TELUS	Arcadyan	B21A	Advanced LNE	GigE LAN(2), 2.5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (160 MHz) HP(2), 5 GHz MIMO (160 MHz) above 2x2 HP(4), MoCA, Bluetooth, Z-wave, 802.15.4(1), PCIe Gen 3 Base(3), AP 5K-10K DMIPS	12.00
TELUS	Arcadyan	B6EMA	Advanced LNE	2.5 GigE LAN Active, 2.4 GHz Radio HP, 5 GHz Radio (160 MHz) HP, 5 GHz MIMO (160 MHz) above 2x2 HP(2), 6 GHz Radio (160 MHz) HP, 6 GHz MIMO (160 MHz) above 2x2 HP(2), Bluetooth, 802.15.4(1), PCIe Gen 3 Base(2)	9.30
TELUS	Arcadyan	TELUS Wi-Fi Hub (XGS PON)	IAD 10GB PON	GigE LAN(4), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP(2), 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(4), MoCA, FXS(2), USB 3, PCIe Gen 3 Base(3), AP 5K-10K DMIPS, AP Addl. Over 10K DMIPS	16.60
TELUS	Arcadyan	TELUS Wi-Fi Hub (GPON)	IAD SFP GPON	GigE LAN(4), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP(2), 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(4), MoCA, FXS(2), USB 3, PCIe Gen 3 Base(3), AP 5K-10K DMIPS, AP Addl. Over 10K DMIPS	18.00

Signatory	Manufacturer	Model Number	Base Type	Claimed Allowances	Reported Ready State Power (W)
TELUS	Arcadyan	TELUS Wi-Fi Hub (GigE)	IAD GigE	GigE LAN(3), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP(2), 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(4), MoCA, FXS(2), USB 3, PCIe Gen 3 Base(3), AP 5K-10K DMIPS, AP Addl. Over 10K DMIPS	16.00
TELUS	Arcadyan	B6L	Advanced LNE	GigE LAN(2), 2.4 GHz Radio HP, 5 GHz Radio (160 MHz) HP, 5 GHz MIMO (160 MHz) above 2x2 HP(2), PCIe Gen 1 & 2 Base	5.20
TELUS	Nokia	XS-230X-A	IAD Fiber WAN	10 GigE LAN Active, FXS(2)	8.50
Videotron	Commscope	TG4482	IAD D3.1	GigE LAN(3), 2.5 GigE LAN Active, 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, Bluetooth, 802.15.4, PCIe Gen 1 & 2 Base(2), PCIe Gen 1 & 2 Addl Lane, AP 5K-10K DMIPS, AP Addl. Over 10K DMIPS	24.00
Videotron	Sercomm	DM1000	Basic D3.1	2.5 GigE LAN Active	10.50
Videotron	Sagemcom	XE2-SG	Basic LNE	GigE LAN(2), 2.4 GHz Radio LP, 5 GHz Radio (20, 40, 80 MHz) LP(2), 5 GHz MIMO (20, 40, 80 MHz) above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe Gen 1 & 2 Base(3)	6.50
Videotron	Vantiva	CGM4331COM	IAD D3.1	GigE LAN(4), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP(2), 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, Bluetooth, 802.15.4, PCIe Gen 1 & 2 Base(2), PCIe Gen 1 & 2 Addl Lane, AP 5K-10K DMIPS, AP Addl. Over 10K DMIPS	15.00
Videotron	Hitron	CODA-4680	IAD D3.1	GigE LAN(4), 2.4 GHz Radio HP, 2.4 GHz MIMO above 2x2 HP, 5 GHz Radio (20, 40, 80 MHz) HP, 5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe Gen 1 & 2 Base(2)	17.00
Videotron	eero	Pro 6E	Advanced LNE	GigE LAN(2), 2.4 GHz Radio LP, 5 GHz Radio (20, 40, 80 MHz) LP, 6 GHz Radio (20, 40, 80 MHz) LP, 802.11n 256 QAM, Bluetooth, AP 5K-10K DMIPS	8.70
Videotron	eero	eero 6	Advanced LNE	GigE LAN(2), 2.4 GHz Radio LP, 5 GHz Radio (20, 40, 80 MHz) LP, 802.11n 256 QAM, USB 2, Bluetooth, 802.15.4, AP 5K-10K DMIPS	5.00
Videotron	Hitron	CODA 56	Basic D3.1	2.5 GigE LAN Active	10.50

Table 10 lists the base and feature allowances (in watts) and feature descriptions for SNE received in 2024 shown in Table 9.

Table 10: Small Network Equipment Allowances

Description	Descriptor	Allowance (W)
Base Allowance: IAD Devices (by WAN interface)		
DOCSIS 3.1 No FDX	IAD D3.1	14.0
Gigabit Ethernet	IAD GigE	3.7
10 GB Ethernet	IAD 10 GigE	5.5
SFP with GPON	IAD SFP GPON	5.0
10G EPON	IAD 10G EPON	13.0
On-board Fiber WAN (without SFP)	IAD Fiber WAN	5.0
10GB PON WAN (with SFP)	IAD 10GB PON	13.0
Base Allowance: LNE		
LNE other than Advanced LNE	Basic LNE	1.5
Advanced LNE	Advanced LNE	3.2
Adders for LAN interfaces and Additional Functionality		
1 Gigabit Ethernet port	GigE LAN	0.2
2.5 Gigabit Ethernet port connected (active link)	2.5 GigE LAN Active	2.5
2.5 Gigabit Ethernet port not connected	2.5 GigE LAN	0.8
5 Gigabit Ethernet port connected (active link)	5 GigE LAN Active	2.5
10 Gigabit Ethernet port connected (active link)	10 GigE LAN Active	3.5
Wi-Fi 2.4 GHz radio with a conducted output power of less than 200 mW per chain up to 2x2	2.4 GHz Radio LP	1.0
Additional allowance per RF chain above 2x2 MIMO at 2.4 GHz with a conducted output power of less than 200 mW per chain	2.4 GHz MIMO above 2x2 LP	0.1
Wi-Fi 5 GHz radio up to 80 MHz channel bandwidth with a conducted output power of less than 200 mW per chain up to 2x2	5 GHz Radio (20, 40, 80 MHz) LP	1.6
Additional allowance per RF chain above 2x2 MIMO at 5 GHz up to 80 MHz channel bandwidth with a conducted output power of less than 200 mW per chain	5 GHz MIMO (20, 40, 80 MHz) above 2x2 LP	0.1

Description	Descriptor	Allowance (W)
Wi-Fi 5 GHz radio at 160 MHz channel bandwidth with a conducted output power of less than 200 mW per chain up to 2x2	5 GHz Radio (160 MHz) LP	2.0
Additional allowance per RF chain above 2x2 MIMO at 5 GHz at 160 MHz channel bandwidth with a conducted output power of less than 200 mW per chain	5 GHz MIMO (160 MHz) above 2x2 LP	0.1
Wi-Fi 6 GHz radio up to 80 MHz channel bandwidth with a conducted output power of less than 200 mW per chain up to 2x2	6 GHz Radio (20, 40, 80 MHz) LP	1.6
Additional allowance per RF chain above 2x2 MIMO at 6 GHz up to 80 MHz channel bandwidth with a conducted output power of less than 200 mW per chain	6 GHz MIMO (20, 40, 80 MHz) above 2x2 LP	0.1
Wi-Fi 6 GHz radio at 160 MHz channel bandwidth with a conducted output power of less than 200 mW per chain up to 2x2	6 GHz Radio (160 MHz) LP	2.0
Additional allowance per RF chain above 2x2 MIMO at 6 GHz at 160 MHz channel bandwidth with a conducted output power of less than 200 mW per chain	6 GHz MIMO (160 MHz) above 2x2 LP	0.1
Wi-Fi 2.4 GHz radio with a conducted output power of greater than or equal to 200 mW per chain up to 2x2	2.4 GHz Radio HP	1.1
Additional allowance per RF chain above 2x2 MIMO at 2.4 GHz with a conducted output power of greater than or equal to 200 mW per chain	2.4 GHz MIMO above 2x2 HP	0.2
Wi-Fi 5 GHz radio up to 80 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain up to 2x2	5 GHz Radio (20, 40, 80 MHz) HP	2.1
Additional allowance per RF chain above 2x2 MIMO at 5 GHz up to 80 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain	5 GHz MIMO (20, 40, 80 MHz) above 2x2 HP	0.3
Wi-Fi 5 GHz radio at 160 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain up to 2x2	5 GHz Radio (160 MHz) HP	2.6
Additional allowance per RF chain above 2x2 MIMO at 5 GHz at 160 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain	5 GHz MIMO (160 MHz) above 2x2 HP	0.3
Wi-Fi 6 GHz radio at 160 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain up to 2x2	6 GHz Radio (160 MHz) HP	2.6
Additional allowance per RF chain above 2x2 MIMO at 6 GHz at 160 MHz channel bandwidth with a conducted output power of greater than or equal to 200 mW per chain	6 GHz MIMO (160 MHz) above 2x2 HP	0.3
Wi-Fi IEEE 802.11n at 2.4GHz supporting 256-QAM	802.11n 256 QAM	0.3
MoCA 1.1/2.0 Single Channel	MoCA	2.2
FXS	FXS	0.3
USB 2.0 - no load connected	USB 2	0.1
USB 3.0 - no load connected	USB 3	0.2
Bluetooth	Bluetooth	0.5
Z-wave	Z-wave	0.2
802.15.4 for ZigBee, Thread, etc.	802.15.4	0.2
PCIe Interface Gen 1 & 2 Base (includes first lane)	PCIe Gen 1 & 2 Base	0.2
PCIe Gen 1 & 2 Additional Lane	PCIe Gen 1 & 2 Addl Lane	0.1
PCIe Interface Gen 3 Base (includes first lane)	PCIe Gen 3 Base	0.3
Application Processor 5K-10K DMIPS	AP 5K-10K DMIPS	1.0
Application Processor > 10K DMIPS (for every addl. 5K DMIPS)	AP Addl. Over 10K DMIPS	0.5

APPENDIX C: AVAILABILITY OF ENERGY-EFFICIENCY INFORMATION FOR CONSUMERS

The service provider signatories committed to providing reasonable, public access to energy-efficiency information for reported set-top boxes and small network equipment. The URLs for such information are posted below. Information for all companies is also available at www.energyefficiency-va.ca.

Table 11: Consumer Set-Top Box Energy-Efficiency Information

Service Provider Signatory	Consumer information Location
Bell	https://bce.ca/responsibility/overview/2024-bell-stb-energy-information.pdf
Cogeco	https://energyca.cablelabs.com/cogeco/
Rogers	https://energyca.cablelabs.com/rogers/
TELUS	https://www.energyefficiency-va.ca/wp-content/uploads/2024/12/TELUS-Web-Site-STB-Energy-Info-2024_11_13.pdf
Videotron	https://energyca.cablelabs.com/videotron/

Table 12: Consumer Small Network Equipment Energy-Efficiency Information

Signatory	Consumer Information Location
Bell	https://bce.ca/responsibility/overview/2024-bell-sne-energy-information.pdf
Cogeco	https://energyca.cablelabs.com/cogeco-sne/
Rogers	https://energyca.cablelabs.com/rogers-sne/
TELUS	https://www.energyefficiency-va.ca/wp-content/uploads/2025/03/TELUS-Web-Site-SNE-Energy-Info-2025_03_31.pdf
Videotron	https://energyca.cablelabs.com/videotron-sne/

APPENDIX D: STB AND SNE ANNUAL PROCUREMENT AUDITS

CEEVA requires service provider signatories to submit annual procurement data to the Data Aggregator, D+R, which collects and analyzes the data and publishes the results in this Annual Report. To protect confidential information, all data in the Annual Report are aggregated. To verify the accuracy of the submitted information from each service provider, both CEEVA STB and CEEVA SNE require an annual audit of one service provider's procurement figures.

Accordingly, the Data Aggregator conducted audits of the 2024 procurement data of one randomly selected service provider per program, which were used to develop the findings published in this 2024 Annual Report. The service providers were selected at random using the "random" function in Excel, and were prompted to provide the Data Aggregator a list of all new set-top boxes received in 2024 for CEEVA STB and a list of all new small network equipment in the case of the signatory selected for CEEVA SNE. D+R also requested shipment details and specification sheets for each model procured in both cases.

D+R, as the Data Aggregator, has determined that the data submitted by each service provider as part of the audit are consistent with the annual reports submitted by each party.

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