

Canadian Energy-Efficiency Voluntary Agreement for Set-top Boxes (CEEVA STB)

Revised September 1, 2021

Table of Contents

1	Introduction	4
2	General Definitions	4
3	Equipment Covered	6
4	Commitments	6
5	Test Method.....	7
5.1	Testing for Compliance Determination	7
5.2	Quality Assurance	7
6	Reporting	8
6.1	Annual Report.....	8
6.2	Disclosure of Model Information to Consumers	10
7	Annual Procurement Audit.....	10
8	Steering Committee Operating Procedures	10
9	Review and Amendment of the Agreement.....	12
10	Remediation.....	12
11	Termination	14
12	Term.....	15
13	Legal Effect; Miscellaneous	15
13.1	Intention of Agreement	15
13.2	Confidentiality.....	15
13.3	Governing Law	15
Annex A	Glossary of Acronyms	16
Annex B	Program Requirements and Test Method.....	17
B.1	Introduction	17
B.2	Compliance Notation	17
B.3	Definitions.....	17
B.4	Qualification Criteria.....	20
B.5	Test Criteria.....	26
Annex C	[Removed].....	29
Annex D	Test Method Examples (Informative).....	30
D.1	Using ANSI/CTA-2043-A Set-top Box (STB) Power Measurement Standard	30
Annex E	New Feature Process	33
E.1	Purposes	33

E.2 Testing.....33
E.3 Allowances.....33
Annex F CEEVA COMPETITION LAW ADVISORY STATEMENT.....35
SIGNATURES.....36

Index of Tables

Table 1: Base Type TEC Allowances.....22
Table 2: Additional Functionality TEC Allowance (TEC_{ADDL_i})24
Table 3: Operational Mode Durations26
Table 4: Service Provider Network Interface Priority27
Table 5: HNI Priority.....27
Table 6: Display Device Interface Priority.....28

Index of Equations

Equation 1: Maximum TEC21
Equation 2: Measured TEC25

1 Introduction

This non-regulatory, Canadian Energy Efficiency Voluntary Agreement for Set-top Boxes (“STB CEEVA” or “Agreement”) aims to complement the ENERGY STAR Set-top Box program in Canada by establishing feature-based energy consumption allowance levels for new Set-top Boxes Received by Canadian pay-TV Service Providers. The overall objective of the STB CEEVA is to achieve the deployment of efficient Set-top Boxes without a) restricting the rapid pace of technological innovation characteristic of the pay-TV market sector, or b) adversely impacting the usability of Set-top Boxes. The CEEVA program also includes a second program to improve the energy efficiency of Small Network Equipment used for residential Internet service in Canada (“CEEVA SNE”) covered by a separate agreement.

The STB CEEVA aligns with the technical standards and test method employed by a similar set-top box voluntary agreement in the United States (USVA), while enabling Canadian Service Providers and other stakeholders to depart from the USVA as appropriate for the Canadian market. Standardization provides Canadian consumers and service providers that purchase equipment with a broader and more competitive range of equipment options manufactured for a larger continental North American market.

CEEVA involves the legitimate cooperation amongst competitors to advance the national public interest in energy conservation. However, the Parties are mindful of the restrictions of the Canadian Competition Act designed to prevent certain anti-competitive activities. All participants are responsible for ensuring compliance with the CEEVA Competition Law Advisory Statement set forth in Annex F, the antitrust and competition policies of their own organizations, and all applicable law.

2 General Definitions

This section defines the general definitions used in STB CEEVA.

1. “Conditional Access” means the encryption, decryption, and authorization techniques employed to make access to content conditional upon authorization using a key that is dynamically allocated using a conditional access (CA) or Digital Rights Management (DRM) system.
2. “Data Aggregator” means the party designated by the Steering Committee that is tasked with, and is responsible for, the collection and processing of reporting information supplied by Signatories, and determining a Signatory’s compliance with the Agreement.
3. “Endorser” means a non-signatory Member that publicly endorses the Agreement.
4. “End User” means a subscriber to pay-TV services provided by a Service Provider who uses a Set-top Box provided by the Service Provider as part of the subscription.
5. “Home Network Interface” (HNI) means the interface with external devices over a local area network (e.g. MoCA, HPNA, IEEE 802.3, IEEE 802.11, HomePlug AV) capable of transmitting video content.
6. “Members” mean the Members of the Steering Committee, which consist of Signatories and Non-signatory Members.
7. “Manufacturer” means a Signatory that designs, develops and/or manufactures Set-top Boxes or components thereof for deployment in Canada by a Service Provider.

8. “Non-signatory Member(s)” means those companies or organizations that are Members of the Steering Committee but are not Service Providers or Manufacturers.
9. “Receive” means to take delivery of any new (not refurbished) Set-top Box for commercial deployment in Canada.
10. “Reporting Period” means the period for which the required information is to be submitted by a Signatory (which is generally January 1st to December 31st).
11. “Reporting Template” means the format for Service Providers’ annual reports as approved by the Steering Committee and posted on the CEEVA website.
12. “Service Provider” means a Signatory that provides pay-TV (and possibly other) content to Canadian residential End User subscribers with whom it has an ongoing contractual relationship through a cable, satellite, or other managed distribution network provided by that entity.
13. “Set-top Box” (“STB”) means a device (1) which is capable of receiving digital television services from a coaxial, hybrid fiber coaxial, or fiber-to-the-home distribution system, from satellites, or encapsulated in IP packets from managed IP distribution networks in order to decrypt or descramble these signals and to decode/decompress for delivery to a single residential consumer display and/or recording device, and/or one or more other Set-top Boxes or Thin Clients in a residential multi-room architecture, and (2) that is Received by a Canadian Service Provider for the first time on or after the Tier 1 Effective Date. The Set-Top Boxes subject to CEEVA are limited to the following Set-Top Boxes supplied by Service Providers to residential End Users:
 - 1) STBs with a Personal Video Recorder (PVR) feature
 - 2) STBs without a Personal Video Recorder (PVR) feature
 - 3) Thin Client STBs
 - 4) Cable Digital Transport Adapter (DTA) STBs
 - 5) Multi-Service Gateway STBs
14. “Signatory” and “Signatories” mean those Manufacturers and Service Providers that sign this Agreement.
15. “Steering Committee” means the coordinating and governing body of this Agreement.
16. “Thin Client” means a STB that can receive and decode video content solely over a Home Network Interface from another STB and does not include a Service Provider network interface.
17. “Tier 1” means the efficiency levels established in ENERGY STAR Version 3.0 Program Requirements.
18. “Tier 2”, “Tier 3”, and “Tier 4” means the respective efficiency levels established in Annex B.
19. “Tier 1 Effective Date” means January 1, 2017.
20. “Tier 2 Effective Date” means January 1, 2018, except that as applied to a Signatory that signs the Agreement after that date and before the Tier 3 Effective Date, it shall mean the date established when that party signs the Agreement.
21. “Tier 3 Effective Date” means January 1, 2023, except that as applied to a Signatory that signs the Agreement after that date and before the Tier 4 Effective Date, it shall mean the date established when that party signs the Agreement.

22. “Tier 4 Effective Date” means January 1, 2025, except that as applied to a Signatory that signs the Agreement after that date, it shall mean the date established when that party signs the Agreement.
23. “Typical Energy Consumption” or “TEC” is the product of a method for evaluating energy efficiency through a calculation of expected energy consumption for a typical Set-Top Box over a one year period, expressed in units of kWh/year.
24. “Unit Under Test” or “UUT” means the equipment being tested.
25. “USVA” means the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-top Boxes, initially executed in 2012.

A glossary of acronyms is provided in Annex A.

3 Equipment Covered

This STB CEEVA covers all new Set-top Boxes Received by Canadian Service Providers after the applicable tier Effective Date. Service Providers may defer reporting of confidential new models that have not been deployed commercially, provided that the Service Provider must separately notify the Data Aggregator of the number of such excluded Set-Top Boxes. If the excluded model is commercially deployed in a future Reporting Period, all of the previously excluded Set-Top Boxes must be reported as Received during that Reporting Period.

For purposes of the foregoing commitments, “new” Set-Top Boxes do not include any Set-Top Box that was Received for the first time before an otherwise applicable tier’s Effective Date, including any such Set-Top Box that is returned to the Service Provider and refurbished, repaired, and/or upgraded, and then redeployed after such date.

4 Commitments

From the applicable Tier Effective Date as defined in Section 2, the commitment objective of CEEVA STB is that ninety percent (90%) of all new Set-top Boxes that a Service Provider Receives in each calendar year shall meet the applicable efficiency levels established in Annex B.

Service Providers will support:

- reasonable steps to inform consumers about the general energy consumption characteristics and performance of Set-top Boxes, as described in Section 6; and
- reasonable steps to monitor the effectiveness of this Agreement through the procedures described in Section 9.

Manufacturers will use reasonable efforts to design Set-top Boxes which improve functionality and enable Set-top Boxes to be controlled and operated in an energy efficient manner without compromising the user experience.

5 Test Method

The STB CEEVA test method was developed with the following goals in mind:

- provide repeatable results that approximate “real world” energy consumption (i.e., as actually operated in an end user setting), and
- minimize test burden for Signatories by adopting USVA specifications with clarifications and examples.

5.1 Testing for Compliance Determination

The applicable test methodologies for all required power measurement values is the [ANSI/CTA-2043-A: Set-top Box \(STB\) Power Measurement](#), as published in November 2019 by the Consumer Technology Association and further described in Annex B. Tests must be conducted using an EPA-Recognized Laboratory, or tests may be conducted in other test facilities which are pre-approved by the Steering Committee on Set-top Boxes in their default configuration. Tests must be conducted on Service Provider headend equipment. The Steering Committee may approve the use of subsequent versions of ANSI-CTA-2043-A or a successor standard, and modifications to the test method.

Publicly reported TEC should reflect values that a customer would experience if using the device with the pre-specified TEC equation duty cycles.

After a Service Provider has obtained testing (in accordance with CEEVA) and reported a particular model, that model may be exempt from testing in subsequent years if:

- a) the initial test result of the model is at least 5% below the maximum allowed TEC for the currently applicable Tier,
- b) current instances of the model do not have any significant hardware or software modifications, and
- c) the model is not claiming any new allowances from the original reporting year. (An example of this might be if a STB supports UHD-4 but was not tested with 4K content and did not take the allowance in the initial year, it cannot take the allowance in subsequent years unless retested with a 4K content).

5.2 Quality Assurance

For all forms of testing described above for reporting and determination of compliance, the following quality assurance requirements apply. Test results must be certified by any certification body that:

- a) is ISO 17065 accredited and/or is recognized by the Standards Council of Canada for Set-top Box testing and qualification of Supervised Manufacturer’s Test Laboratories (SMTLs) or is 17025 accredited to test per the method defined by CEEVA,,
- b) has Steering Committee approval, and
- c) adheres to a quality assurance scheme that meets the following requirements:
 - 1) Tests shall be conducted in the certification body’s lab or the Service Provider’s lab by certification body staff, or by SMTL staff in a SMTL lab. A Manufacturer or Service Provider may act as a SMTL.

- 2) Tests must be conducted on a live network with Set-top Boxes in default configuration.
- 3) The scheme will not include a challenge test program or certification labeling.

6 Reporting

STB CEEVA Members communicate with the public in two ways, a) by publishing a single STB CEEVA annual report, and b) by making feature and energy consumption information about each of the new models they offer to their pay-TV service subscribers readily available to consumers.

6.1 Annual Report

Each Service Provider shall send to the Data Aggregator a confidential annual report by April 1 after each Reporting Period containing the data for the prior Reporting Period during which it was a Signatory. The Data Aggregator shall provide its report to the Steering Committee, which will publish the public annual report for each Reporting Period by August 15.

6.1.1 Service Provider Reports to the Data Aggregator

The information in the Service Provider's annual report to the Data Aggregator shall include all of the information requested in the Reporting Template.

Service Providers are encouraged to report information to the Data Aggregator that can help to describe energy consumption trends and energy efficiency progress, such as a shift to Thin Clients or cloud-based services, or the use of new features that consume energy.

A Reporting Period covers a single calendar year. When a new Service Provider is making its first report, it may provide data either for the entire prior Reporting Period (effectively backdating its commitment to the January 1 preceding its signature) or provide a report covering only the period beginning with its signature or a different effective date for the new Signatory approved by the Steering Committee.

6.1.2 Data Aggregator's Report to the Steering Committee

The Data Aggregator shall aggregate Service Provider reports of models/units/annual energy use and report aggregated TEC in each of the categories specified in the Reporting Template. The Data Aggregator shall also provide a list of all reported Set-Top Box Models Received during the Reporting Period, including identification of the manufacturer, model number, features, modal power, and TEC. The Data Aggregator's report should put data in context, and may report trends useful for power load planning, such as overall rate of change in Set-top Box national energy consumption.

The Data Aggregator's report shall calculate the percentage of the Canadian pay-TV market covered by the Agreement as of the end of the Reporting Period by aggregating the Service Providers' reports of the number of residential pay-TV subscribers served, and dividing by the total number of residential pay-TV subscribers served by both Signatory and non-signatory Service Providers in Canada using data from the CRTC, if available.

The Steering Committee will ensure that the contract with the Data Aggregator protects the confidentiality of information supplied by the Signatories, and aggregation must be sufficient so that no individual company's results can be deduced or reasonably approximated. The Data Aggregator's report

to the Steering Committee shall not include confidential or commercially sensitive information, such as shipping or volume reports or features that have not been publicly announced.

6.1.3 Public Annual Report

The Steering Committee shall publish a public annual report that will:

- Identify participating Members during the Reporting Period.
- Identify the aggregate number of video customers served by Service Provider Signatories compared with the number of Canadian residential pay-TV subscribers served by all Service Providers (including those outside of the Agreement) during the Reporting Period.
- Report efficiency gains under the Agreement using a method and baseline adopted by the Steering Committee.
- Include a narrative of trends, such as overall progress under the Agreement, overall rate of change in total annual energy consumption, and underlying factors that drive that energy consumption up or down.
- Include an Appendix of Set-top Boxes which Service Providers have Received during the Reporting Period including their model numbers and features, modal power use (e.g., On and Sleep) and annual energy use (TEC). The information shall not include confidential or commercially sensitive information, such as shipping or volume reports or features that have not been publicly announced.
- Include the results of the procurement audit conducted pursuant to Section 7, without disclosing the identity of the audited party.

6.2 Disclosure of Model Information to Consumers

Service Providers shall provide their subscribers and potential customers with reasonable access to energy efficiency information about their own Set-top Boxes subject to this Agreement and shall update this information by April 1 following each subsequent reporting period. For any new Service Provider Signatories, this commitment will become effective six months after signature. The energy efficiency information that the Service Provider shall make available under this section shall include for each model of Set-top Box Received after the Tier 1 Effective Date:

- Modal power use (e.g., On and Sleep) and Typical Energy Consumption (TEC) as measured in the as-deployed configuration; and
- A feature set description, similar to those reported to ENERGY STAR (e.g., HD, PVR, whole home, HNI, auto power down enabled, etc.), that will be sufficient to calculate the applicable allowances.

Models shall be distinguished if energy use varies by configuration. This information need not be updated for software and/or configuration changes unless changes significantly affect energy use. This information shall be made publicly available for each model made available to the Service Provider's subscribers. This Section does not require Service Providers to disclose confidential or commercially sensitive information, such as features that have not been publicly announced.

7 Annual Procurement Audit

The Data Aggregator or other third party selected by the Steering Committee will conduct an audit of procurement figures for one Service Provider selected at random each year. The same Service Provider shall not be randomly selected two years in a row. The identity of the Service Provider selected for audit will be made known to the Steering Committee. The result of the audit will be included in the annual report, but the identity of the Service Provider selected will not be disclosed to the public.

8 Steering Committee Operating Procedures

A Steering Committee is established as the coordinating and governing body of this Agreement. The operating procedures set forth herein are intended to:

- ensure a made in Canada agreement, standards and Steering Committee;
- create a simplified, transparent and accountable process;
- support a consensus approach to decision making, with the need for "votes" to be used in very limited circumstances; and
- not hamper innovation or unduly disrupt the Canadian market or Canadian consumers.

Steering Committee Members consist of Signatories, which are the participating Service Providers and Manufacturers, and Non-signatory Members, which are the government, non-governmental, utility, and trade association organizations that participate in Member meetings. Membership requires a commitment to fully support Steering Committee duties. The Steering Committee selects and instructs

the Data Aggregator that annually submits aggregated data to the Steering Committee. The Steering Committee appoints and can remove Members if necessary. If a Member is removed, it can still attend public meetings.

The Chair of the Steering Committee will be elected by the Steering Committee for a term through the release of the next Annual Report.

The Steering Committee shall meet at least annually, which shall accommodate online attendance to include full participation including voting. Upon request from any signatory the Chair can call a special Steering Committee meeting to deal with emergent issues.

To promote efficiency, the Steering Committee meetings may be conducted jointly with the Steering Committee for the CEEVA for Small Network Equipment (SNE). If possible, both committees will be chaired by the same person who represents a Signatory of both Agreements, and committee meetings may have a single consolidated agenda and minutes. Any contested votes specific to one agreement shall only be cast by persons eligible to vote with respect to that agreement.

A quorum of three-fourths of all Signatories is required to conduct a formal meeting of the Steering Committee.

Any member of the public may make an advance request to the Chair attend a Steering Committee meeting. Any meeting open to the public may also include a Member meeting limited to Members and/or a Signatory meeting limited to Signatories. The committee shall work on a consensus model, resorting to a vote taken by voting Members only when full discussion has occurred, and arguments and objections have been fully explored and recorded in minutes. If consensus is not clear, then Signatories decide by vote (to be determined by a simple majority) in which each Service Provider casts a single vote and for which Signatory Manufacturers and the Consumer Technology Association (CTA) cast two votes total. This Agreement does not define how CTA and Manufacturers would cast their two votes. If warranted to resolve a procedural disagreement, the Chair may rely on Robert's Rules of Order to the extent consistent with the terms of STB CEEVA.

The Steering Committee's duties include:

- administering the new feature process;
- developing annual reports;
- maintaining a website to make information about CEEVA available to the public, including annual reports and links to service provider model information as required by Section 6.2;
- reviewing and amending the Agreement on annual basis; and
- managing Membership to include removal of Signatories if substantial efforts to achieve corrective action are not successful.

The Chair must prepare the draft agenda of the Steering Committee meeting. The Chair must include in the draft agenda all points proposed by the Members of the Steering Committee and, where relevant, all points that may be received from observers. Invitations to the Steering Committee meeting must be sent to all Members of the Steering Committee. An announcement of the Steering Committee meeting, including the provisional agenda, must be posted on the CEEVA website not later than twenty days in advance of the meeting. Requests for participation in the Steering Committee are evaluated by the Chair taking into consideration the pertinence of the request.

Documents to be presented and discussed at the Steering Committee meeting must be sent to all members of the Steering Committee by email no later than 7 working days in advance of the meeting. All members of and observers to the Steering Committee must have a right to be heard at the Steering Committee meetings and to request the Chair to register their views in the minutes.

The Chair shall prepare minutes from each Steering Committee meeting, circulate them to all Steering Committee Members, and post them on the CEEVA website within thirty days of the meeting. The Chair must allow at least two weeks after circulation of minutes for members and observers to the Steering Committee to submit comments before further distribution and final publication on the website.

The Signatories must bear all expenses related to the operation of the Steering Committee.

The Steering Committee may decide to convene a working group to carry out specific tasks. In this case, the Chair will decide on the composition of the group, its specific tasks and the time frame of its operation. The working group may consist of Members, observers to the Steering Committee, and/or external experts, and must be required to report to the Steering Committee on the results of its work within a deadline specified by the Chair or the Steering Committee. The requirements of this Section 8 are not applicable to meetings or communications at which no official Steering Committee votes may be taken, such as a working group meeting, or to Steering Committee votes taken by email.

9 Review and Amendment of the Agreement

At least once each reporting year the Steering Committee will meet to review the Agreement in order to:

- evaluate the effectiveness of the Agreement in achieving its purposes as identified in Section 1 above;
- approve an annual report consistent with Section 6;
- review any changes to the USVA and consider whether to implement similar changes in CEEVA;
- evaluate current and future developments that may influence energy consumption with a view to agreeing upon a course of action and/or revising the Agreement; and
- consider whether to set future targets to increase energy efficiencies in accordance with the usual product development cycles.

Amendments to CEEVA can be adopted by a unanimous vote of the Signatories at a Steering Committee meeting and/or through voting via email.

10 Remediation

Failure to meet STB CEEVA commitments could take several forms:

1. Failure to meet applicable Tier procurement commitments (90% of new Set-top Boxes) set forth in Section 4. This form of non-compliance may be self-reported or the result of an audit. While the Service Provider Signatories agree to make reasonable efforts to meet these commitments,

it is recognized that unforeseen factors may affect these efforts, such as the strains on the supply chain that resulted from the COVID-19 pandemic.

2. Failure to provide required information for the annual report as described in Section 6 in a timely manner.
3. Failure to post easily accessible public information about new Set-top Box models in accordance with Section 6 in a timely manner.
4. Failure to participate in review and amendment of the Agreement as described in Section 9.

The initial objective of the Steering Committee when dealing with a non-compliant Signatory is to be supportive and assistive of that entity moving into compliance. A Signatory that is aware it is or will be non-compliant should advise the Data Aggregator and NRCan of the deficiency as soon as possible.

If the Data Aggregator finds substantial non-compliance in a Service Provider report, it shall notify NRCan and the Service Provider by May 15. Once notified of non-compliance or anticipated non-compliance directly by a Service Provider or indirectly by the Data Aggregator, the following steps shall be taken:

1. The Data Aggregator will provide, to NRCan's satisfaction, all necessary information, including all communication between the Service Provider and the Data Aggregator, to enable a complete understanding of the non-compliance problem.
2. NRCan will meet with the non-compliant Service Provider to discuss the non-compliance problem and to develop a corrective action plan, which should include measurable success metrics to include checkpoints, completion dates, and expectations for status reporting.
3. NRCan will follow up with the Service Provider by reviewing status reports and meeting with the Service Provider at key checkpoints and providing written feedback to the Service Provider.

If the corrective action plan involves a recovery plan such that no Service Provider commitments are missed at the end of the Reporting Period, then the matter shall be closed between NRCan and the Service Provider without Steering Committee engagement. For example, NRCan works with a Service Provider that, mid-year, is concerned that they will not meet its STB CEEVA commitments, to develop a software patch that brings their affected Set-top Boxes into compliance by the end of the Reporting Period.

However, if the matter involves providing an enduring exception to Service Provider commitments, then NRCan would work with the non-compliant Service Provider to develop a corrective action plan that remediates the energy impact of exception, and then NRCan would propose this plan to the Steering Committee for approval. For example, if a Service Provider offered a new, more efficient approach to digital TV content distribution (e.g. network PVR) but their Set-top Boxes purchasing falls just out of compliance, NRCan may recommend to grant this Service Provider a time-limited exception. The Steering Committee would have the ability to approve or reject NRCan's recommendation.

In developing corrective action recommendations to the Steering Committee, NRCan should consider the balance of the Service Provider's commitment to save energy for its Canadian subscribers. For example, if 89% of a Service Provider's new Set-top Boxes meet STB CEEVA allowance levels by a large margin, and the non-compliant models narrowly miss, then NRCan might take this into consideration

when developing corrective active recommendations for the Steering Committee. However, it should be noted that STB CEEVA allowance levels are not intended to represent fleet average efficiency levels. The intent is that 90% of Service Provider boxes comply by a large enough margin that even the units at the lower-efficiency end of the normal distribution curve comply.

Finally, if the non-compliant Service Provider fails to execute a corrective action plan, then NRCan shall refer the matter to the Steering Committee, which shall develop next steps up to and including removal of the non-compliant signatory from the STB CEEVA. NRCan's role is consultative and does not involve enforcement activities. Only the Steering Committee has the authority to determine compliance. Involuntary termination of Signatory status by the Steering Committee constitutes the sole and complete remedy available to the Steering Committee, Signatories, NRCan, the Data Aggregator or any third party or other individuals or entities with respect to any alleged noncompliance with any term, provision or obligation of the STB CEEVA by a Signatory. Nothing in the preceding sentence limits rights that Parties may have under other legally-binding agreements or applicable law. In addition, if NRCan or provincial regulators, after ineffective course correction actions, determine that on balance Signatories are not meeting the letter or the spirit of the Agreement, then NRCan or other regulators may terminate their Membership and develop federal or provincial regulatory approaches to increasing the energy efficiency of Set-top Boxes.

NRCan shall preserve the confidentiality of information exchanged between NRCan and non-compliant Service Providers via mechanisms outlined in the [Access to Information Act](#). If NRCan refers a matter to the Steering Committee, then the non-compliant Service Provider shall not be required to share confidential information with other Members. Because the Steering Committee may have less information than NRCan about the source of non-compliance and progress towards completion of the corrective action plan—because some or all of this information would put the non-compliant Service Provider at risk in terms of its competitive position—the Steering Committee may rely heavily on NRCan's recommendation to continue working with the non-compliant Service Provider to correct its course or to remove it from STB CEEVA.

11 Termination

Any Service Provider or Manufacturer may elect to terminate its Signatory status by giving twenty-eight days' written notice to the Chair of the Steering Committee. Such termination shall immediately terminate all of that Signatory's rights and obligations under the Agreement except that all confidentiality obligations arising from this Agreement shall survive such termination. The Chair will notify all Members of the Steering Committee and such other persons as the Chair may deem appropriate of the termination. Any Non-signatory Member may elect to terminate its Member status by giving twenty-eight days' written notice to the Chair of the Steering Committee. Such termination shall immediately terminate that Member's access to Member-only meeting and other information shared by Members and not the general public.

12 Term

The initial term of this Agreement began on the Tier 1 Effective Date (January 1, 2017). In 2021, CEEVA STB was extended through December 31, 2026, with the publication of the annual report in 2027. The Agreement may be renewed by mutual agreement.

13 Legal Effect; Miscellaneous

13.1 Intention of Agreement

STB CEEVA sets out a course of action for the Signatories to improve the energy efficiency of Set-Top Boxes. STB CEEVA is not a commercial agreement, does not create any legally binding obligations on any of the parties hereto, and does not in itself create any contractual relationship, partnership, joint venture or other agency relationship among the Signatories. Nothing in this Agreement shall be deemed to create a third-party beneficiary relationship.

13.2 Confidentiality

The Parties have entered into a separate, enforceable Confidentiality Agreement related to information exchanged under STB CEEVA. Nothing in this document shall limit a party's rights pursuant to that separate agreement.

13.3 Governing Law

STB CEEVA shall be governed by the laws of the Province of Ontario and the federal laws of Canada applicable therein, without regard to its choice of law principles.

Annex A Glossary of Acronyms

Acronym	Term
APD	Auto Power Down
AVP	Advanced Video Processing
CA	Conditional Access
CEEVA	Canadian Energy Efficiency Voluntary Agreement
CEEVA SNE	Canadian Energy Efficiency Voluntary Agreement for Small Network Equipment
CEEVA STB	Canadian Energy Efficiency Voluntary Agreement for Set-Top Boxes
CRTC	Canadian Radio-television and Telecommunications Commission
DRM	Digital Rights Management
DTA	Digital Transport Adapter
HD	High Definition
HNI	Home Network Interface
HPNA	Home Phonenumber Network Alliance (also known as HomePNA)
IEEE	Institute of Electrical and Electronics Engineers
IP	Internet Protocol
MoCA	Multimedia over Coax Alliance
MR	Multi-Room
MSG	Multi-Service Gateway
NRCan	Natural Resources Canada
PVR	Personal Video Recorder
SMTL	Supervised Manufacturer Test Laboratory
STB	Set-top Box
TC	Thin Client
TEC	Typical Energy Consumption
UHD	Ultra High Definition
USVA	U.S. Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-top Boxes
UUT	Unit Under Test

Annex B Program Requirements and Test Method

B.1 Introduction

This annex defines Maximum Typical Energy Consumption (TEC) base and additional feature energy allowances, allowance rules, and the Typical Energy Consumption (TEC) equation used to determine compliance with the procurement commitments of STB CEEVA. This annex applies only to Set-Top Boxes Received on or after the applicable Tier Effective Date. These requirements are intended to be identical to USVA requirements. Testing must be conducted per the Quality Assurance requirements set forth in Section 5 of STB CEEVA.

B.2 Compliance Notation

As used in this annex, “shall” and “must” denote mandatory provisions. “Should” denotes a provision that is recommended but not mandatory. “May” denotes an item whose presence does not preclude compliance, and implementation of which is optional. “Optional” denotes items that may or may not be present in a compliant device.

B.3 Definitions

The definitions below are specific to this annex only and shall supersede the General Definitions listed in Section 2 of STB CEEVA where there are differences.

A) STB Base Types:

- 1) Cable (CBL): A STB that can receive and decode video content as delivered from a Service Provider hybrid fiber/coaxial distribution system using a Conditional Access System (CAS).
- 2) Satellite (SAT): A STB that can receive and decode video content as delivered from a Service Provider satellite network using a Conditional Access System (CAS).
- 3) Cable Digital Transport Adapter (DTA): A minimally-configured unidirectional Set-Top Box without recording functionality that can receive and decode video content as delivered from a coaxial or hybrid fiber coaxial system using a Conditional Access System (CAS).
- 4) Internet Protocol (IP): A STB that can receive and decode video content encapsulated in IP packets from a Service Provider managed distribution network.
- 5) Thin Client (TC): A STB that can receive and decode video content solely over a Home Network Interface from another STB and does not include a Service Provider network interface.

B) Client: A device (e.g. STB, Thin-Client STB, Smart TV, Mobile Phone, Tablet, PC, etc.) that can receive video content over a Home Network Interface.

C) Multi-Service Gateway STB (MSG-STB): A STB that is capable of joining multiple Service Provider delivery protocols and/or that provisions a video service and at least one of voice or broadband services from a Service Provider.

D) Additional Functionality:

- 1) CableCARD (CC): The capability to decrypt premium video content and services and provide other network control functions via a plug-in Conditional Access module that complies with the ANSI/SCTE 28 HOST-POD Interface Standard.¹
- 2) Personal Video Recorder (PVR): A feature that enables recording and playback of video content from a hard disk drive (HDD) or other integrated non-volatile storage. A PVR often includes features such as: Play, Record, Pause, Fast Forward (FF), and Fast Rewind (FR). STBs that only support buffering or a Service Provider network-based PVR service are not eligible for the PVR feature allowance. The presence of a PVR feature does not mean the device is defined to be a STB.
- 3) DOCSIS™: The capability to distribute data and video content over cable television infrastructure according to the following specifications:
 - i) DOCSIS 2.0 (D2): DOCSIS 2.0 interface as defined by CableLabs® Data Over Cable Service Interface Specification.²
 - ii) DOCSIS 3.0 (D3): DOCSIS 3.0 interface as defined by CableLabs® Data Over Cable Service Interface Specification.³
- 4) High Definition (HD): The capability to transmit or display video signals with a minimum output resolution of 1280×720 pixels in progressive scan mode at minimum frame rate of 59.94 fps (abbreviated 720p60) or a minimum output resolution of 1920×1080 pixels in interlaced scan mode at 29.97 fps (abbreviated 1080i30).
- 5) Advanced Video Processing (AVP): The capability to decode video signals in accordance with standards H.264/MPEG 4 or SMPTE 421M.
- 6) Transcoding (XCD): Additional capability to translate (e.g. MPEG2 to H.264), transrate (e.g. HD bitrate to Mobile bitrate), transscale (e.g. HD resolution to Mobile resolution), transcrypt (e.g. CAS to DRM), or perform audio format conversions (e.g. AC-3 to AAC) in real-time.
- 7) Home Network Interface (HNI): the interface with external devices over a local area network (e.g. MoCA, HPNA, IEEE 802.3, IEEE 802.11, HomePlug AV) capable of transmitting video content.
- 8) WiFi HNI (WiFi HNI): A wireless HNI as specified by IEEE 802.11
- 9) Multi-Input Multi-Output WiFi (MIMO WiFi): functionality that supports more than one Spatial Stream⁴ for both send and receive.
- 10) Shared PVR (S-PVR): The capability to provide independent PVR video content to more than one Display Devices and/or Clients in a single-subscriber configuration.

¹ <http://www.scte.org/standards>

² <http://www.cablelabs.com/cablemodem/specifications/specifications20.html>

³ <http://www.cablelabs.com/cablemodem/specifications/specifications30.html>

⁴ Spatial Stream: Spatial multiplexing is transmission techniques in MIMO wireless communication to transmit independent and separately encoded data signals, so-called Spatial Streams, from each of the multiple transmit antennas. Therefore the space dimension is reused, or multiplexed, more than one time. The number of receive antenna does not define the number of Spatial Streams. The common description “2 x N: 2” means 2 send streams x N antennas: 2 receive streams, where N will always be the same or larger as the largest number of streams.

- 11) Multi-Room (MR): The capability to provide independent live video content to more than two Display Devices and/or Clients in a single-subscriber configuration.
 - 12) Multi-Stream (MS): The capability to receive multiple independent streams of video content for use with one or more Clients, one or more directly-connected Display Devices, a PVR, or picture-in-picture, etc., in a single-subscriber configuration.
 - 13) Routing (RTG): The capability to determine the path along which network traffic should be forwarded.
 - 14) Access Point (AP): The capability to provide wireless network IEEE 802.11 (Wi-Fi) connectivity to multiple clients.
 - 15) Ultra High Definition – 4K (UHD-4): The capability to transmit or display video signals with a minimum output resolution of 3840×2160 pixels in progressive scan mode at minimum frame rate of 24 frames per second (“2160p24”).
 - 16) High Efficiency Video Processing (HEVP): Video decoding providing compression efficiency significantly higher than H.264/AVC, for example HEVC (H.265).
 - 17) Telephony: The ability to support analog telephone service through one or more RJ11 or RJ14 jacks.
- E) Auto Power Down (APD): A STB feature that monitors parameters correlated with user activity or viewing. If the parameters collectively indicate that no user activity or viewing is occurring, the APD feature enables the STB to transition to a lower power mode known as APD Mode.
- F) Principal STB Functions: Functions necessary for selecting (EPG), receiving, decoding, decompressing, or delivering live or recorded video content to a Display Device, local/remote recording device, or Client. Monitoring for user or network requests is not considered a Principal STB Function.
- G) Operational Modes:
- 1) On Mode: The STB is connected to a mains power source. At least one Principal STB Function is activated and all Principal STB Functions are provisioned for use. The power consumption in On mode may vary based on specific use and configuration.
 - 2) Sleep Mode: A range of reduced power states where the STB is connected to a mains power source and is not providing any Principal STB Function. The STB may transition to On or other mode due to user action, internal signal, or external signal. The power consumed in this mode may vary based on specific use or configuration. If any Principal STB Function is activated while operating in this mode, the STB is assumed to transition to On mode. Monitoring for user or network requests is not considered a Principal STB Function. The STB shall be able to transition from this mode to On mode within 30 seconds.
 - 3) Deep Sleep Mode: Deep Sleep represents the lowest average power consumption state where Principal STB Functions can be re-activated without user action and without the transition time requirement of SLEEP Mode. A Deep Sleep Mode that is entered and exited on a schedule is also referred to as “Scheduled Sleep Mode”.

- 4) APD Mode: If the parameters collectively indicate that no user activity or viewing is occurring, the APD feature enables the STB to transition to Auto Power Down Mode, which may be similar to Sleep Mode.

H) Other Definitions

- 1) Display Device (DD): A device (e.g., TV, Computer Monitor, or Portable TV) that receives its content directly from a STB through a video interface (example: High-Definition Multimedia Interface (HDMI), Component Video, Composite Video, or S-Video), not through a HNI, and displays it for viewing.
- 2) Service Provider (SP): An entity that provides video (and possibly other) content to subscribers with whom it has an ongoing contractual relationship through a cable, satellite, or other managed distribution network provided by that entity.
- 3) Conditional Access System (CAS): The encryption, decryption, and authorization techniques employed to protect content from unauthorized viewing. CableCARD and Downloadable Conditional Access System (DCAS) are examples of Conditional Access technology.

B.4 **Qualification Criteria**

B.4.1 Significant Digits and Rounding

- 1) All measured and calculated power values shall be rounded as follows:
 - i) To the nearest 0.01 W for power measurements of 10 W or less
 - ii) To the nearest 0.1 W for power measurements of greater than 10 W and up to 100 W
 - iii) To the nearest 1 W for power measurements of greater than 100 W
- 2) All measured and calculated TEC values shall be rounded as follows:
 - i) To the nearest 0.01 kWh/y for values of 10 kWh/y or less
 - ii) To the nearest 0.1 kWh/y for values of greater than 10 kWh/y and up to 100 kWh/y
 - iii) To the nearest 1 kWh/y for values of greater than 100 kWh/y

B.4.2 General Qualification Criteria

- 1) Device Operation Requirements:
 - i) Products may automatically exit Sleep mode and/or Deep Sleep mode on a regular schedule to perform maintenance activities. The total time spent performing maintenance activities shall not exceed an average of two hours in any 24-hour period. Maintenance activities may include, but are not limited to; software updates, electronic programming guide updates, HDD maintenance, and routine diagnostic operations.
 - ii) Products that automatically exit Sleep mode or Deep Sleep mode and have completed maintenance or other user-requested activities (e.g. user pre-scheduled recording) shall automatically return to Sleep mode or Deep Sleep mode in less than 15 minutes.
 - iii) Products that provide a default (no user opt-in) speculative recording function shall provide a user-accessible menu option to permit users to disable the functionality. Instructions for disabling speculative recording shall be made available to the user.
 - iv) Energy-related default settings shall persist until an end-user chooses to disable or modify the default settings.
 - v) Products represented as offering an APD feature shall meet the following requirements:

- (1) STBs shall be deployed with APD enabled by default, with APD timing set to engage after a period of inactivity less than or equal to 4 hours.
 - (2) Otherwise, at time of installation the Service Provider shall enable APD timing to engage after a period of inactivity less than or equal to 4 hours. The Service Provider may vary these settings in order to provide a good customer experience, but the average APD timeout period must be less than or equal to 4 hours.
 - (3) Products that provide an APD feature should provide a user-accessible menu option to permit users to modify or disable the functionality.
 - (4) Products that provide an APD feature shall not provide the ability to disable the APD functionality with a single-button press from the APD timeout notification screen such that the disabled APD state is persisted.
- vi) Products represented as offering a Deep Sleep mode shall meet the following criteria:
- (1) STBs shall be deployed with automatic Deep Sleep mode enabled by default.
 - (2) Otherwise, at time of installation the Service Provider shall enable automatic Deep Sleep mode.
 - (3) Products that provide a Deep Sleep mode should provide a user-accessible menu option to permit users to modify or disable the functionality.
 - (4) Products that provide a Deep Sleep feature shall not provide the ability to disable the Deep Sleep functionality with a single-button press from a timeout notification screen such that the disabled Deep Sleep state is persisted.

B.4.3 Maximum Typical Energy Consumption Requirement

1) Maximum TEC:

The maximum allowed TEC is the sum of the specified STB Base type allowance and the sum of all applicable Additional Functionality Allowances as defined in Equation 1.

Equation 1: Maximum TEC

$$TEC_{MAX} = TEC_{BASE} + \sum_1^i TEC_{ADDL_i}$$

Where:

TEC_{BASE} is the Base Type Allowance (kWh); and

TEC_{ADDL_i} is each applicable Additional Functionality Allowance (kWh).

2) Base Allowances shall be as specified in Table 1:

If a STB supports more than one base type definition, then the topmost base type listed in Table 1 must be used to classify the device.

Table 1: Base Type TEC Allowances

Base Type (Use Topmost if Multiple Apply)	Tier 2 Allowance (kWh/y)	Tier 3 Allowance (kWh/y)	Tier 4 Allowance (kWh/y)
Cable DTA (DTA)	25	40	40
Cable (CBL)	45	50	45
Satellite (SAT)	50	55	50
Internet Protocol (IP)	45	40	15
Thin Client (TC)	12	25	25

Note: The nominal increase in most base allowances from Tier 2 to Tier 3 in fact represents a significant reduction due to the incorporation of the Tier 2 allowances for the first Advanced Video Processing decoder (8 kWh/year) and High Definition (12 kWh/year) into the Tier 3 (and Tier 4) base allowances.

- 3) Additional Functionality Allowances shall be as specified in Table 2, subject to the following usage rules:
- i) Each Additional Functionality Allowance shall be used at most **once per STB** unless otherwise specified.
 - ii) **DTA** base type shall only use the **UHD-4** and **HEVP** allowances in addition to the **HD**, **AVP**, and **HNI** allowances if applicable. (Note: there are no separate HD and AVP allowances in Tiers 3 and 4).
 - iii) **TC** base type shall only use the **UHD-4**, **HEVP**, and **RTG**⁵ allowances in addition to **HD**, **AVP**, **HNI**, **WiFi HNI**, **MoCA HNI**, **MIMO WiFi** (or the Tier 3-4 WiFi) allowances if applicable.
 - iv) **AVP** allowance shall be used for each decoder that is active during the On mode test up to a maximum of two (2) for Tier 2. For Tiers 3 and 4, one **AVP** allowance shall be used only for a second decoder that is active during the On Mode test (e.g., for a picture-in-picture feature).
 - v) **CableCARD** allowance shall be used for each CableCARD up to a maximum of two (2).
 - vi) **PVR** allowance shall not be used with STB types that support a Service Provider network-based “PVR” service and do not use a hard disk drive (HDD) or other integrated non-volatile storage.
 - vii) **PVR-A** allowance may be applied to PVR STBs with a 3.5 inch hard disk drive with 1 terabyte (TB) of storage or greater, for each full TB of integrated storage up to a maximum of 2 TB, in addition to the PVR allowance.
 - viii) Either **DOCSIS 2.0 (D2)** allowance OR **DOCSIS 3.0 (D3)** allowance, but not both, shall be used if applicable.

⁵ When a Set-Top Box or Thin Client is capable of mesh networking functionality that extends Wi-Fi Internet access associated with a residential High Speed Data service throughout a home, the RTG allowance can also be used.

- ix) **DOCSIS 3.0 (D3)** allowance is applicable to all DOCSIS 3.0 configurations.
- x) DOCSIS 3.0 above 8x4 (**D3 above 8x4**) allowance is an additional allowance (to D3), applicable to DOCSIS 3.0 configurations with more than 8 DS channels. One “D3 above 8x4” allowance shall be taken for each additional bundle of 4 DS channels above 8 up to and including 32 DS channels.
- xi) Either **Shared PVR (S-PVR)** allowance OR **Multi-Room (MR)** allowance, but not both, shall be used if applicable.
- xii) Either **Multi-Room (MR)** allowance OR **Home Network Interface (HNI)** allowance, but not both, shall be used if applicable.
- xiii) **MoCA HNI (M-HNI)** allowance and/or the Tier 2 **WiFi HNI (W-HNI)** allowance are used in addition to the **MR** allowance or **HNI** allowance and shall only be used if the interface is providing video content during the qualification test (e.g. If a **MoCA HNI** and a **WiFi HNI** provide video content to Clients concurrently during the qualification test then both allowances may be taken).
- xiv) **MIMO WiFi HNI (MIMO)** allowance is additive to the **WiFi HNI (W-HNI)** allowance for Tier 2.
- xv) **Multi-Stream (MS)** allowance shall be used for devices receiving two (2) video content streams during the qualification test.
- xvi) **Multi-Stream Additional (MS-A)** allowance is used in addition to the **MS** allowance and shall be used for devices receiving greater than two (2) and, up to and including, eight (8) video streams, and two **MS-A** allowances apply to STBs with more than eight (8) and up to sixteen (16) streams.
- xvii) **Transcoding Base (XCD)** allowance shall be used if the device includes a transcoding feature in addition to the basic video decoding required for directly connected Display Devices.
- xviii) **Transcoding Additional (XCD-A)** allowance is additive to **Transcoding Base (XCD)** and shall be used once for each actively transcoded video stream during the qualification test.
- xix) **Routing (RTG)** Routing allowance may be used if the device is providing IP routing functionality, forwarding IP data packets from one IP network to another as part of a high-speed data service. Routing of IP video packets as part of a pay-TV video distribution service should be considered a new feature if it involves incremental energy consumption and subject to the new feature allowance setting process.
- xx) **UHD-4** can be taken once per STB, and can be taken in addition to the Tier 2 HD allowance.
- xxi) **HEVP** can be taken once per STB, and can be taken in addition to the Tier 2 AVP allowance.
- xxii) The following additional Tier 4 rules apply to IP base type Non-DVR STB models:
 - (1) These IP Non-DVR models shall not be eligible for the Home Network Interface HNI allowance if the model has a Wi-Fi interface and does not have a MoCA interface.
 - (2) The HEVP allowance for these IP Non-DVR models shall be limited to 5 kWh/yr.

Table 2: Additional Functionality TEC Allowance (TEC_{ADDL_i})

Additional Functionality	Tier 2 Allowance (kWh/year)	Tier 3 Allowance (kWh/year)	Tier 4 Allowance (kWh/year)
Advanced Video Processing (AVP) (first active decoder)	8	0	0
Advanced Video Processing (AVP) (second active decoder)	8	8	8
High Definition (HD)	12	0	0
Multi-Stream (MS) ($1 < \text{received streams} \leq 2$)	8	8	8
Multi-Stream Additional (MS-A) (first MS-A allowance for 3-8 streams; second allowance for 9-16 streams) (max 2)	8*	8*	8*
Transcoding (XCD)	13	13	13
Transcoding Additional (XCD-A) (per tested stream transcoded)	5*	5*	5*
CableCARD (CC) (per CC, max 2)	15*	15*	10*
DOCSIS 2.0 (D2)	20	20	20
DOCSIS 3.0 (D3) (up to and including 8x4 mode)	50	45	40
DOCSIS 3.0 additional downstream channels (for every additional 4 downstream channels in excess of 8 up to and including 32) (D3 above 8x4)	11*	11*	11*
Personal Video Recorder (PVR)	45	20	15
PVR 3.5" hard disk drive (per 1 TB storage, max 2) (PVR-A)	NA	15*	10*
Shared PVR (S-PVR)	20	20	20
Multi-Room (MR)	40	25	20
Home Network Interface (HNI)	10	10	10
MoCA HNI (M-HNI)	12	12	12
WiFi HNI (W-HNI)	15	0	0
MIMO WiFi HNI (MIMO)		0	0
Wi-Fi IEEE 802.11n radio at 2.4 GHz or at 5.0 GHz with a conducted output power less than 200 mW per chain (up to 2x2, i.e. 400 mW) (Wi-Fi(n) LP)	NA	9*	9*
Wi-Fi, IEEE 802.11ac radio at 5 GHz with a conducted output power less than 200 mW per chain (up to 2x2, i.e. 400 mW) (Wi-Fi(ac) LP)	NA	19*	16*

⁶ To claim spatial streams at both $N_{2.4 \text{ GHz}}$ and $N_{5.0 \text{ GHz}}$ the channels must operate concurrently. If concurrent channel operation is not supported then the channel/spatial stream combination yielding the higher allowance should be used.

Additional Functionality	Tier 2 Allowance (kWh/year)	Tier 3 Allowance (kWh/year)	Tier 4 Allowance (kWh/year)
Additional allowance per RF chain above a 2x2 MIMO configuration (e.g., for 3x3 and 4x4) with a conducted output power less than 200 mW per chain (Wi-Fi above 2x2 LP)	NA	3*	3*
Wi-Fi IEEE 802.11n radio at 2.4 GHz or at 5.0 GHz with a conducted output power greater than or equal to 200 mW per chain (up to 2x2, i.e. 400 mW) (Wi-Fi(n) HP)	NA	11*	10*
Wi-Fi, IEEE 802.11ac radio at 5 GHz with a conducted output power greater than or equal to 200 mW per chain (up to 2x2, i.e. 400 mW) (Wi-Fi(ac) HP)	NA	22*	20*
Additional allowance per RF chain above a 2x2 MIMO configuration (e.g., for 3x3 and 4x4) with a conducted output power greater than 200 mW per chain (Wi-Fi above 2x2 HP)	NA	4*	3*
Routing (RTG)	27	27	27
Access Point (AP)	8	8	8
High Efficiency Video Processing (HEVP)	10	10	10, 5**
Ultra High Definition – 4K (UHD-4)	5	5	5
Telephony (TELE)	4	4	4
* Indicates allowance may be used more than once			
** See usage rule xxii above			

B.4.4 Measured Typical Energy Consumption Requirements

The measured values derived from Section 5 below are used in combination with the TEC equation to calculate the $TEC_{MEASURED}$ value for the device.

- 1) Measured TEC ($TEC_{MEASURED}$) shall be less than or equal to the Maximum TEC Requirement (TEC_{MAX}), as calculated using Equation 1.
- 2) $TEC_{MEASURED}$ shall be calculated using Equation 2.

Equation 2: Measured TEC

$$TEC_{MEASURED} = 0.365[(T_{WATCH_TV} \times P_{WATCH_TV}) + (T_{SLEEP} \times P_{SLEEP}) + (T_{APD} \times P_{APD}) + (T_{SCHED_SLEEP} \times P_{SCHED_SLEEP})]$$

Note: The maximum value for T_{SCHED_SLEEP} is four (4) hours for the purposes of this program. To claim Scheduled Sleep the device must transition to and from Scheduled Sleep mode automatically when in the as-deployed configuration.

Where:

- T_{WATCH_TV} is the time coefficient for On Mode, as determined per Table 3;
- P_{WATCH_TV} is the measured power in On Mode (W);
- T_{SLEEP} is the time coefficient for Sleep Mode, as determined per Table 3;

- P_{SLEEP} is the measured power in Sleep Mode (W);
- T_{APD} is the time coefficient for APD, as determined per Table 3;
- P_{APD} is the measured power after an APD timeout (W);
- T_{SCHED_SLEEP} is the time operating in Scheduled Sleep Mode time (maximum of 4h); and
- P_{SCHED_SLEEP} is the measured power in Scheduled Sleep Mode (W).

3) Operational Mode Durations for use with Equation 2 are specified in Table 3:

Table 3: Operational Mode Durations

APD Enabled by Default	Automatic Scheduled Sleep	T_{WATCH_TV}	T_{SLEEP}	T_{APD}	T_{SCHED_SLEEP}
NO	NO	14	10	0	0
NO	YES	14	$10 - T_{SCHED_SLEEP}$	0	T_{SCHED_SLEEP} as-deployed duration
YES	NO	$7 - ((4 - T_{APD_SETTING})/2)$	10	$7 + ((4 - T_{APD_SETTING})/2)$	0
YES	YES	$7 - ((4 - T_{APD_SETTING})/2)$	$10 - T_{SCHED_SLEEP}$	$7 + ((4 - T_{APD_SETTING})/2)$	T_{SCHED_SLEEP} as-deployed duration

Note: $T_{APD_SETTING}$ is the configured APD timeout value in the device. Default APD timeout durations of less than 4h are given a 50% credit toward reduction of the T_{WATCH_TV} 7h duration. The 7h is the sum of 5h, accounting for the national average TV watching time, and 2h, assuming 50% of users shut off the TV but leave the STB on which causes APD to trigger after the default 4h duration resulting in the addition of 2h to national TV watching time per day. The reduction of the APD timeout results in a reduction in T_{WATCH_TV} .

B.5 Test Criteria

A) Test Method:

The CEEVA STB Program requires the use of the ANSI/CTA-2043-A: Set-top Box (STB) Power Measurement standard test procedure, as published in November 2019 by the Consumer Technology Association, for all required power measurement values.

B) Number of Units Required for Testing:

- 1) A product configuration equivalent to that which is intended to be marketed is considered a Representative Model;
- 2) A single unit of each Representative Model shall be selected for testing. If the resulting $TEC_{MEASURED}$ is within 5% of the TEC_{MAX} requirement, two (2) additional units of the same Representative Model with an identical configuration shall be tested.
- 3) All tested units shall be less than or equal to the TEC_{MAX} for the device configuration to meet the requirements.

C) Configuration Testing Rules:

- 1) STBs offering more than one integrated Service Provider (SP) network interface option at time of installation may either be tested with each combination of Service Provider network interface and each result reported under a different STB sub-model or the STB may be tested using the

Service Provider interface priority as specified in Table 4 and reported once under the primary model number. This table may not apply to TC STB types.

Table 4: Service Provider Network Interface Priority

Connection (Protocol)
Coax (QAM/DOCSIS)
Coax (SAT/MoCA)
Coax (QAM/MoCA)
Wi-Fi (802.11)
Coax (HPNA)
Ethernet (802.3)
Other

- 2) STBs offering more than one integrated HNI option at time of installation, but operating with only one HNI after installation, may either be tested with each Service Provider network interface and each result reported under a different STB sub-model or the STB may be tested using the HNI connection priority as specified in Table 5 and reported once under the primary model number.

Table 5: HNI Priority

Connection (Protocol)
MIMO Wi-Fi HNI
Wi-Fi HNI
Coax (MoCA)
Coax (HPNA)
HomePlug AV
Ethernet (802.3)
Other

- 3) STBs offering concurrent operation of integrated HNIs at time of installation must be tested with the HNIs providing video content.
- 4) STBs offering more than one Display Device interface shall use the priority as specified in Table 6 for each Display Device.

Table 6: Display Device Interface Priority

Connection (Protocol)
HDMI/DVI
Component
S-Video
Composite
Coax
Other

- 5) STBs claiming the **Multi-Room (MR)** allowance must be tested with three (3) live video streams with at least one (1) Client (receiving live video) in addition to locally connected Display Devices, if supported. If three (3) live streams are not supported the MR allowance may not be used.
- 6) STBs claiming the **Shared PVR (S-PVR)** allowance must be tested with two (2) independent PVR video streams serving one of the following configurations:
 - i) One directly connected Display Device and one Client
 - ii) Two directly connected Display Devices
 - iii) Two Clients
- 7) Thin Clients claiming the **RTG** allowance must be tested with routing enabled.

Annex C [Removed]

Annex D Test Method Examples (Informative)

D.1 Using ANSI/CTA-2043-A Set-top Box (STB) Power Measurement Standard

This annex provides an example that may be helpful to the reader when calculating CEEVA total energy consumption equations using test results based on the ANSI/CTA-2043-A Set-top Box (STB) Power Measurement standard.

For the following the example UUT is defined by:

CBL, AVP (x2), HD, MS, MS-A (8), CC(x1), D3, PVR, S-PVR, HNI, M-HNI with APD

Base Type (Use Topmost if Multiple Apply)	Tier 2 Allowance (kWh/yr)
Cable (CBL)	45

Per Table 1: Base Type TEC Allowances

$$TEC_{Base} = 45$$

Additional Functionality	Tier 2 Allowance (kWh/yr)	UUT
Advanced Video Processing (AVP) (per active decoder, max 2)	8	16
High Definition (HD)	12	12
Multi-Stream (MS) (1 < received streams ≤ 2)	8	8
Multi-Stream Additional (MS-A) (2 < received streams ≤ 8)	8	8
CableCARD (per CC, max 2)	15	15
DOCSIS 3.0 (D3) (up to and including 8X4 mode)	50	50
Personal Video Recorder (PVR)	45	45
Shared PVR (S-PVR)	20	20
Home Network Interface (HNI)	10	10
MoCA HNI (M-HNI)	12	12
Total		196

Per Table 2: Additional Functionality TEC Allowance (TECADDL_i)

CBL, AVP (x2), HD, MS, MS-A (8), CC(x1), D3, PVR, S-PVR, HNI, M-HNI

$$TEC_{ADD} = 196$$

1) The TEC_{MAX} should be calculated using the STB the base and additional functionalities:

$$TEC_{MAX} = TEC_{BASE} + \sum_{1}^{i} TEC_{ADDL_i}$$

Add the base allowance to the additional allowance total:

$TEC_{MAX} = 241$

The laboratory has tested the device in accordance with the requirements of ANSI/CTA-2043-A and has provided the following test results:

ANSI/CTA-2043-A Parameter	Measured Value
P_{WATCH_TV}	34 W
P_{SLEEP}	15 W
P_{APD}	15 W
$T_{APD_Setting}$	2 Hours

Per Equation 2: Measured TEC definition

2)

$$TEC_{MEASURED} = 0.365[(T_{WATCH_TV} \times P_{WATCH_TV}) + (T_{SLEEP} \times P_{SLEEP}) + (T_{APD} \times P_{APD}) + (T_{SCHED_SLEEP} \times P_{SCHED_SLEEP})]$$

3) APD is enabled as default and automatically enters SLEEP mode in 2 hours. Scheduled Sleep is not supported. Therefore, the following operational mode durations apply:

APD Enabled by Default	Automatic Scheduled Sleep	T_{WATCH_TV}	T_{SLEEP}	T_{APD}	T_{SCHED_SLEEP}
YES	NO	$7 - ((4 - T_{APD_SETTING})/2)$	10	$7 + ((4 - T_{APD_SETTING})/2)$	0

Per Table 3: Operational Mode Durations

Applying the equations of table 3 results in:

$$T_{WATCH_TV} = 6$$

$$T_{APD} = 8$$

$$T_{SLEEP} = 10$$

Finally the $TEC_{MEASURED}$ can be calculated with all the required values.

$$P_{WATCH_TV} = 34$$

$$P_{SLEEP} = 15$$

$$P_{APD} = 15$$

$$T_{WATCH_TV} = 6$$

$$T_{APD} = 8$$

$$T_{SLEEP} = 10$$

$$TEC_{MEASURED} = 0.365[(T_{WATCH_TV} \times P_{WATCH_TV}) + (T_{SLEEP} \times P_{SLEEP}) + (T_{APD} \times P_{APD}) + (T_{SCHED_SLEEP} \times P_{SCHED_SLEEP})] = 173.01 \text{ kWh/yr}$$

Measured TEC ($TEC_{MEASURED}$) shall be less than or equal to the Maximum TEC Requirement (TEC_{MAX}):

$TEC_{MEASURED} = 173.01 \text{ kWh/yr} < 241 \text{ kWh/yr} (TEC_{MAX})$: **the UUT is CEEVA compliant.**

Annex E New Feature Process

E.1 Purposes

- E.1.1 This new feature process is applicable to Tier 2, Tier 3, and Tier 4 Commitments.
- E.1.2 This new feature process is intended to encourage innovation and competition by Service Providers and Manufacturers and also to encourage energy efficiency by design.
- E.1.3 This new feature process is intended to provide a path for Service Providers and Manufacturers to innovate and add new features, including features with no assigned allowances and features that are in the early stages of design, without being treated as in violation of STB CEEVA energy allowances or procurement commitments.
- E.1.4 This new feature process is intended to assure that most Set-Top Boxes remain under the procurement commitments of the STB CEEVA, with sufficient transparency for appropriate allowances to be established for new features.
- E.1.5 All requests for new allowances will be reviewed and approved by the Steering Committee, regardless of whether they have already been approved by the USVA to ensure that made-in-Canada standards prevail.

E.2 Testing

- E.2.1 If a Set-Top Box subject to the STB CEEVA includes one or more new energy consuming features that do not have energy allowances, the Set-Top Box should be tested as deployed under the current test method provided in the STB CEEVA.

E.3 Allowances

- E.3.1 If a Service Provider deploys a Set-Top Box that includes a new feature with no allowance, and the presence of the feature causes the Set-Top Box to exceed the existing levels, the Service Provider will set and report an appropriate initial allowance for the power consumption of that feature when it reports the device under the STB CEEVA.
- E.3.2 The initial allowance will be reported within nine months of the initial deployment of such a Set-Top Box if the Service Provider expects that its percentage of procurement of such Set-Top Box will be sufficient to be reported in its next annual report.
- E.3.3 The initial allowance will represent the Service Provider's best estimate of the amount of energy consumed by the new feature in that particular unit. All new features, associated initial allowances, and justifications for such allowance, will be submitted to the Data Aggregator together with other required testing data.
- E.3.4 The Data Aggregator shall inform the Steering Committee of the Service Provider created allowance for the new feature, except as it affects confidentiality and competitiveness.
- E.3.5 If the new feature is confidential and the Service Provider seeks an allowance, the Service Provider shall confidentially report the initial allowance, the basis for the allowance, and a

written justification for its confidentiality to the Data Aggregator. The new feature may remain confidential until the feature is marketed or otherwise made public. The Service Provider shall inform the Data Aggregator within thirty days of marketing or otherwise making public a previously confidential new feature. In no case may a new feature remain confidential for purposes of this Agreement, for longer than eighteen months from initial deployment. Once a new feature is reported as public information or the eighteen month period has elapsed, the Data Aggregator shall inform the Steering Committee of the Service Provider created allowance for the new feature. Annual reports should include the total energy use of Set-Top Boxes that include confidential new features, but need not identify the new feature.

- E.3.6 When the information is reported to the Steering Committee, the Steering Committee shall propose appropriate allowances and effective dates when the allowances would go into effect under the processes of STB CEEVA. Initial allowances set by the Steering Committee will reflect the Steering Committee's best estimates of the energy consumption required for systems incorporating the new feature to meet the STB CEEVA levels. Initial allowances shall be set within six months of submission, and become effective at such time as is prescribed by the Steering Committee.
- E.3.7 If a Service Provider includes in its report to the Data Aggregator a Set-Top Box that it has Received but has not yet deployed that includes a new feature with no allowance, and the presence of the feature causes the Set-Top Box to exceed the TEC, the Service Provider may report a provisional Service Provider created allowance until an initial allowance is submitted after deployment.
- E.3.8 Allowance setting would be designed to not prejudice a variety of implementations. If a new feature is specific to one particular sub-sector of the pay-TV market sector and its energy consumption when applied to other sectors is undetermined, it may be adopted as applicable only to a particular sector. The process for adopting a level for that feature will apply to other sectors when one of its Service Provider Members submits an allowance for that feature to the Data Aggregator.
- E.3.9 Allowances established by the Steering Committee for a new feature would be publicly reported.

Annex F CEEVA COMPETITION LAW ADVISORY STATEMENT

Every Member is responsible for ensuring that CEEVA's activities are conducted in compliance with the Canadian Competition Act ("Act"). Certain agreements between competitors may constitute a criminal offence under the Act.

CEEVA activities are a legitimate forum for cooperation to further the objectives of this Agreement and generally do not raise competition law issues provided discussions comply with this Advisory Statement and follow a predetermined agenda. However, the Members have adopted this Advisory Statement to mitigate the risk that meetings involving competitors could be used, directly or indirectly, as a vehicle for anti-competitive activities, in particular to facilitate anti-competitive agreements and other collective actions that are prohibited by competition laws.

Of greatest concern is any opportunity for competitors to agree on competitively sensitive matters. In particular, discussions or information exchanges related to pricing (including minimum or fixed prices, price ranges, planned price increases, discounts/rebate levels, additional charges, timing of price changes, and pricing methods and strategies), customers, territories, costs, current or future marketing plans or strategies, expansion plans, market shares, capacity and production levels, new product development except as related to energy efficiency strategies, terms and conditions of sale or service, and profit margins should be strictly avoided.

Any such discussions or exchanges may be evidence of an illegal anticompetitive agreement, which is prohibited even if there is no negative impact on competition, no impact on a market, or even if prices will be lower or markets will be more competitive. A prohibited agreement does not have to be express or in writing, and can involve an implicit understanding or be assumed or inferred from exchanges of information and/or parallel (suspiciously similar) conduct.

It is important that Members ensure they comply with this Advisory Statement and the antitrust and competition policies of their own organizations, avoid conduct which could be in violation of the Act or create the appearance of wrongdoing, and seek appropriate guidance in case of uncertainty.

SIGNATURES

The undersigned Signatories agree to the Voluntary Agreement.

Bell Canada

Signature: /s/ Karen Atkinson

Name: Karen Atkinson

Title: Director of Supply Chain

Date: September 9, 2016

COGECO Connexion Inc.

Signature: /s/ Michel Blais

Name: Michel Blais

Title: Vice President, Engineering and Operations

Date: August 4, 2016

Rogers Communications Canada Inc.

Signature: /s/ Eric Bruno

Name: Eric Bruno

Title: Senior Vice President, Residential Product Management

Date: December 7, 2016

Shaw Communications Inc.

Signature: /s/ Janice Davis

Name: Janice Davis

Title: Senior Vice President, Supply Chain

Date: August 22, 2016

Shaw Communications Inc.

Signature: /s/ Zoran Stakic

Name: Zoran Stakic

Title: EVP & CTO

Date: August 31, 2016

Videotron LTD

Signature: /s/ Daniel Proulx
Name: Daniel Proulx
Title: Chief Technological Officer
Date : September 22, 2016

Videotron LTD

Signature: /s/ Pierre Roy Porretta
Name: Pierre Roy Porretta
Title: Vice President, Engineering, Research and Development
Date: September 22, 2016

CommScope, Inc. of North Carolina f/k/a ARRIS

Signature: /s/ Keith Jones
Name: Keith Jones
Title: SVP & CPO (ARRIS)
Date: November 22, 2016

Signature: /s/ William Pleasant
Name: William Pleasant
Title: VP and Deputy General Counsel (CommScope)
Date: June 10, 2019

EchoStar Technologies L.L.C.

Signature: /s/ Vivek Khemka
Name: Vivek Khemka
Title: President
Date: September 8, 2016

Technicolor Connected Home USA LLC

Signature: /s/ Luis Martinez-Amago
Name: Luis Martinez-Amago
Title: President
Date: July 6, 2017