D+R International

2021 Annual Report

Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Small Network Equipment

Prepared on behalf of the
Steering Committee by:
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EXECUTIVE SUMMARY

In 2015, the largest U.S. residential broadband Internet service providers and manufacturers of small network equipment (SNE), such as modems and routers used by consumers to access such services, led by NCTA — The Internet & Television Association, the Consumer Technology Association (CTA), and CableLabs, signed the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Small Network Equipment. This agreement is modeled after the successful Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes. The primary objective of the agreement is to increase the energy efficiency of SNE while promoting rapid innovation and timely introduction of new and improved features. The service provider signatories served nearly 96 million residential U.S. Internet subscribers at the end of 2021, accounting for 88% of the market.

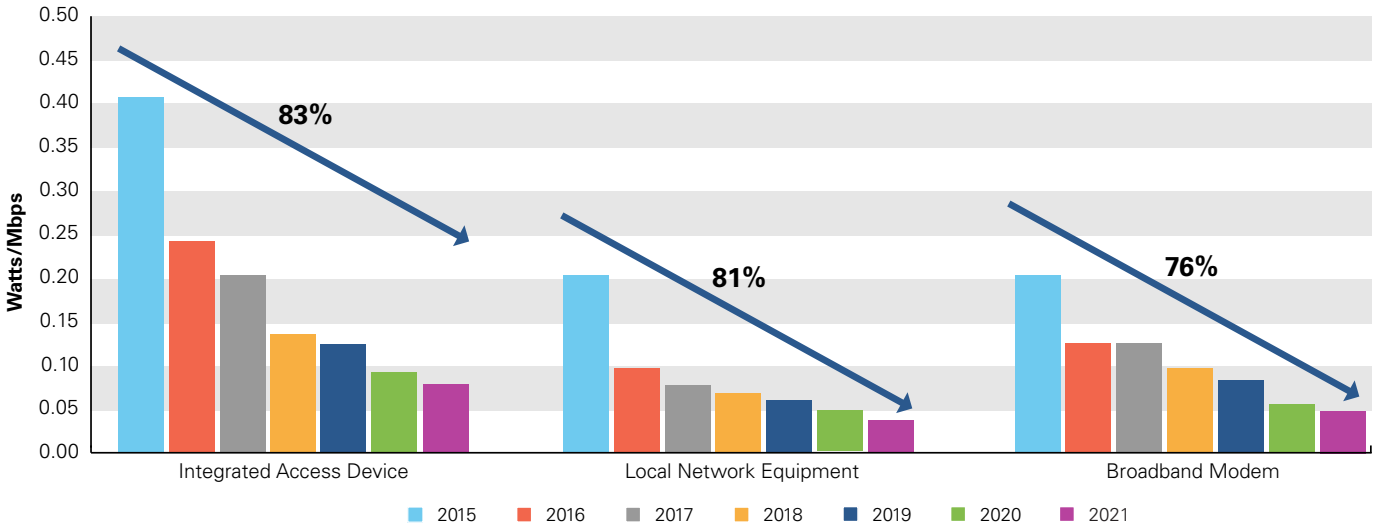
One of the requirements of the Voluntary Agreement is the publication of an annual report that summarizes developments for the previous calendar year. This seventh annual report has been prepared by the Independent Administrator and Auditor, D+R International, Ltd. (D+R).

Under the Voluntary Agreement, signatories commit that at least 90% of all SNE purchased by each service provider or sold by each manufacturer at retail each year, beginning in 2016, will meet the energy-efficiency levels established under the Voluntary Agreement. In 2018, the parties reduced those energy-efficiency levels by an average 11% that applied to their commitments beginning in 2020. This report is the second to evaluate the parties' satisfaction of their commitments under these "Tier 2" efficiency levels. Overall, 98.2% of SNE purchased or sold by the signatories in 2021 met these Tier 2 levels, and all but one signatory met the 90% commitment individually. Per the terms of the Voluntary Agreement, that signatory is developing a remedial plan to offset the excess energy caused by the missed commitment, and the development and implementation of the plan will be overseen by a committee that will include a new Energy Advocate participant in the Voluntary Agreement and D+R. These findings are supported by D+R's review of data from the signatories, including a successful audit of one randomly selected signatory's records.

On average, the SNE purchased in 2021 used about the same energy compared to 2020, even as broadband speeds increased by an average of 27%. With increased speeds and functionality of devices, this report finds that the signatories are delivering SNE functionalities more efficiently. SNE has evolved to stay ahead of consumer demand for faster broadband services, reduced latency, improved Wi-Fi signal strength, and increased capacity for more devices at higher speeds within the home. Average fixed consumer broadband speeds have increased more than sixfold since the start of the Voluntary Agreement in 2015, and support for these speeds requires more energy for processing, memory and other functions. Moreover, new SNE is designed to be capable of supporting the even greater demands anticipated in the future over the expected lifespan of devices. The massive surge in Internet usage that resulted from the start of the COVID-19 pandemic in March 2020, and continued throughout 2021, validated the industry's long-standing strategy to deploy customer equipment capable of transmitting and processing far more capacity than their customers' current service levels. The Voluntary Agreement has enabled this forward-looking approach by allowing additional energy usage to account for new features such as support for new DOCSIS and Wi-Fi technologies that support higher-capacity services.

The average weighted power of each category of new SNE relative to broadband speed delivered has decreased by up to 83%, and has declined every year under the Voluntary Agreement, as shown in Figure 1.

Figure 1: Weighted Average Energy Usage by Equipment Type, Relative to Average Broadband Download Speed



These figures were calculated by dividing the average idle power of each equipment type, as verified by D+R in this report, by the average fixed wireline consumer broadband mean download speed for Q2 2021 reported by Ookla. In the Speedtest® Global Index for the United States, Ookla reported that the average fixed broadband download speed was 194.20 Mbps in Q2 2021. This report is available at https://www.speedtest.net/global-index/united-states?fixed#market-analysis.

The Voluntary Agreement was recently extended through 2025 with a new schedule of more stringent "Tier 3" allowances set to become effective in 2023, developed in partnership with a new Energy Advocate signatory, Pacific Gas and Electric Company (PG&E). "Energy Advocates" have actively participated in the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes for many years, and PG&E's engagement in the SNE program is expected to help to assure the rigor of its commitments and to validate the reports of its progress. To maintain the trend of delivering increasingly robust broadband services while still meeting the commitments of the Voluntary Agreement, the signatories will need to continue to prioritize and invest in energy-efficiency improvements. Consumers and other stakeholders will be able to monitor the parties' progress at www.energy-efficiency.us, which includes links to energy-efficiency information for SNE purchased or sold by each signatory, as well as all previously published annual reports.

OVERVIEW OF THE VOLUNTARY AGREEMENT

Guided by the objective of improved energy efficiency, the signatories crafted the Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Small Network Equipment in 2015 to reduce energy consumption and environmental impact, save their customers money, increase the reliability of their networks, and preserve flexibility conducive to rapid innovation and timely introduction of new features. The Voluntary Agreement provides a framework for the broadband Internet industry to deliver market-based energy-efficiency gains that keep pace with technological innovation and is modeled on the successful Voluntary Agreement for Ongoing Improvement to the Energy Efficiency of Set-Top Boxes that was signed in 2012.

The Internet service provider signatories provided wired broadband Internet services to approximately 96 million U.S. residential customers, or 88% of U.S. broadband households in 2021.[1] The coverage of the Voluntary Agreement has increased since its inception, partly as a result of the addition of Frontier Communications as a signatory in 2017, the 2019 addition of the Suddenlink cable systems owned by Altice USA, and the addition of multiple manufacturer signatories since the start of 2020 (ASUS, eero, Google, Linksys, Plume, Sagemcom and TP-Link).

The Voluntary Agreement 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 (IAD):** 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 principally of routers, but includes wireless access points, switches, and network extenders that bridge or extend a LAN beyond its physical limitations.[2]

Voluntary Agreement Objectives

The objectives of the Voluntary Agreement are to continue improvements in the energy efficiency of SNE, and to foster device and service functionality, while encouraging innovation and competition. The Voluntary Agreement aims to achieve these goals through flexible approaches that allow the delivery of high quality, innovative services to consumers.

Voluntary Agreement Signatories and Steering Committee

The signatories and participants in the Voluntary Agreement are listed below.

Energy Advocate Signatories

- Pacific Gas and Electric Company[3]

Service Provider Signatories

- Altice USA, Inc.
- AT&T Services, Inc.
- CenturyTel Broadband Services, LLC d/b/a Lumen
- Charter Communications, Inc. d/b/a Spectrum
- Comcast Cable Communications, LLC
- Cox Communications, Inc.
- Frontier Communications Corp.
- Verizon Communications, Inc.

1 - Based on data provided by the signatories, NCTA - The Internet & Television Association, and the Consumer Technology Association.
2 - For the full definitions of these categories, see Appendix A of this report or Annex 1 of the Voluntary Agreement.
3 - Pacific Gas and Electric Company signed the Voluntary Agreement as its first Energy Advocate in 2022 and did not participate during the period covered by this report.

Vendor Signatories

- Actiontec Electronics, Inc.
- ASUSTeK Computer Inc. d/b/a ASUS
- CommScope Inc. of North Carolina (formerly ARRIS)
- eero LLC[4]
- Google LLC[5]
- Linksys USA, Inc.
- Netgear, Inc.[6]
- Plume
- Sagemcom Broadband SAS
- Technicolor Connected Home USA LLC
- TP-Link[7]
- Ubee Interactive, Inc.

Other Organizations

- Consumer Technology Association (CTA)
- NCTA - The Internet & Television Association
- Cable Television Laboratories (CableLabs)

The Voluntary Agreement obligates the Steering Committee to designate an Independent Administrator and Auditor to publish an annual report. The Steering Committee designated D+R as the Independent Administrator and Auditor in 2015, and D+R has continued in this role for 2021. This report is the seventh annual report.

The Voluntary Agreement requires that the Steering Committee meet at least once each year. The Steering Committee convened two times in 2021, and working groups were active throughout the year. Additional responsibilities of the Steering Committee include the following:

- Managing the Voluntary Agreement
- Hiring the Independent Administrator
- Reviewing proposals for energy allowances based on new features, which the Steering Committee can approve, reject, or add to the Voluntary Agreement as appropriate
- Evaluating the effectiveness of the Voluntary Agreement in achieving its purposes
- Adopting new or revised efficiency measures, courses of action, and amendments to the Voluntary Agreement as technologies and services change

Earlier this year, the signatories renewed the Agreement, extending the term through 2025 with a report in 2026. The amended agreement also defines a more rigorous Tier 3 schedule of allowances that take effect beginning in 2023.

Signatory Commitments

The primary commitment is to procure and sell energy-efficient SNE. Specifically, beginning January 1, 2016, the commercial signatories committed that 90% of new SNE purchased by service providers or sold at retail by vendors each year will meet the energy-efficiency levels established in the Voluntary Agreement. These efficiency levels became more rigorous in 2020 under a Tier 2 schedule of allowances, and will be further tightened in 2023 under the new Tier 3 schedule allowances. The signatories also committed to provide subscribers and prospective customers with reasonable access to energy-efficiency information for SNE, furnish the Independent Administrator with annual data and test results, and participate in third-party lab testing and audits to verify the information in their annual data reports.

4 - eero recently signed the Voluntary Agreement and will begin reporting for the 2022 Annual Report.
5 - Google recently signed the Voluntary Agreement and will begin reporting for the 2022 Annual Report.
6 - Netgear was an original signatory of the Voluntary Agreement but due to resource constraints suspended reporting during the COVID-19 pandemic. Netgear has committed to resume reporting for 2022.
7 - TP-Link recently signed the Voluntary Agreement and will begin reporting for the 2022 Annual Report.

Independent Administrator and Auditor Role

The Independent Administrator is a third party appointed by the Steering Committee. Under the Voluntary Agreement, the Independent Administrator must aggregate and compile confidential procurement and sales data submitted by the signatories. If the Voluntary Agreement procurement or sales commitments are not met, the Independent Administrator is responsible for working with the signatory to develop a remedial plan under procedures set out in the Voluntary Agreement.

The Independent Administrator is also charged with conducting an audit of one randomly selected service provider's procurement figures or one vendor's sales figures each year. The successful results of the 2021 audit are presented in Appendix C.

New Feature Process for Small Network Equipment

The New Feature Process is intended to encourage innovation and competition by service provider and vendor signatories, and to encourage energy efficiency by design. This process provides a path for signatories to innovate and add new features, including features with no assigned allowances and features in the early stages of design, without being treated as being in violation of Voluntary Agreement energy allowances or commitments. If a service provider signatory deploys, or a vendor signatory sells, SNE that includes a new feature with no allowance, and the presence of the feature causes the device to exceed the prescribed allowances, the signatory may set and report an appropriate initial allowance for the power consumption of that feature when it reports the device under the Voluntary Agreement. When such information is reported, the Steering Committee will propose appropriate allowances and effective dates. New allowances established by the Steering Committee for new features are publicly reported. New feature allowances reported in 2021 are under review by the Steering Committee and upon approval, will be publicly reported.

Remediation and Alternative Energy-Efficiency Strategies

A signatory that fails to meet its procurement or sales commitment must either seek advance credits for alternative energy-efficiency measures or must undertake a remedial plan that secures energy savings that offset the incremental energy associated with devices purchased or sold in excess of the commitment. One signatory failed to meet the procurement commitment in 2021, and efforts are underway between the signatory and Independent Administrator to develop a remedial plan to offset the excess energy associated with the non-compliant devices.

REPORT ON 2021 PROCUREMENT AND SALES COMMITMENTS

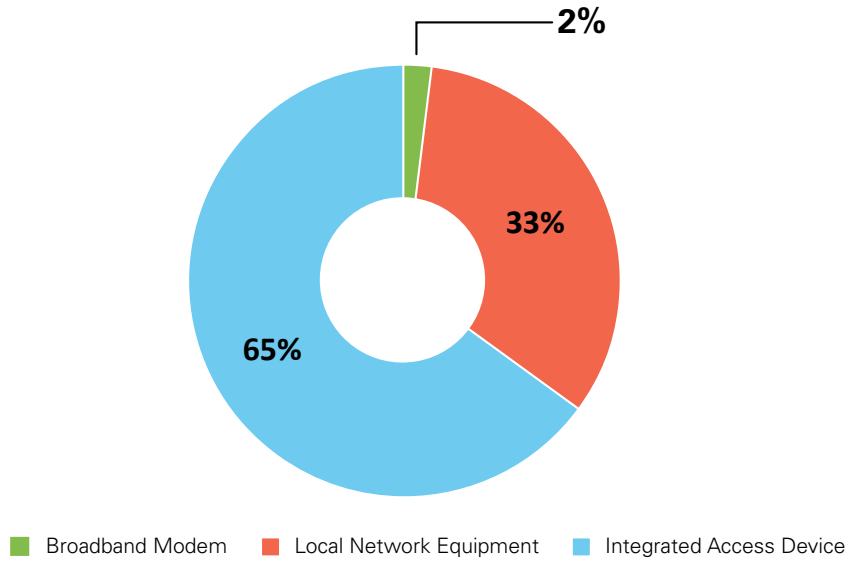
Under the Voluntary Agreement, 90% of SNE purchased or sold at retail each year by commercial signatories after December 31, 2015, must meet specified energy-efficiency levels. The Independent Administrator collected data from the service provider and retail vendor signatories to measure satisfaction of these commitments in 2021. Overall, 98.2% of reported units satisfied the Tier 2 energy-efficiency levels of the Voluntary Agreement in 2021. All but one of the reporting signatories met the 90% threshold individually, and a majority of signatories had 100% of their new purchases or sales meet the energy-efficiency levels of the Agreement. The satisfaction of the procurement commitment spanned every category of SNE, with at least 97% of each category meeting the levels of the Voluntary Agreement, as shown in Table 1. These results demonstrate that the signatories generally met their procurement and sales commitments under the Voluntary Agreement in 2021, and that the one instance of a signatory not meeting the 90% threshold did not have a significant impact on the overall percentage of models meeting Tier 2.

Table 1: Total Number of Reported Units and Number of Units Meeting Energy-Efficiency Levels, by Equipment Type

Category	Reported Units	Number Meeting Tier 2 Levels	Percent Meeting Tier 2 Levels
Broadband Modem	659,427	659,427	100.0%
Integrated Access Device	18,069,804	17,599,890	97.4%
Local Network Equipment	9,001,127	8,966,197	99.6%
Total	**27,730,358**	**27,225,514**	**98.2%**

IADs represent the majority of reported products with 65% of products purchased or sold in 2021, followed by LNE with 33% of products, and, lastly, Broadband Modems at 2%. Figure 2 shows the category breakdown, by percentage, of the units purchased or sold in 2021.

Figure 2: New Small Network Equipment, by Equipment Type



Energy Efficiency of Small Network Equipment

Details of SNE purchased or sold by the signatories in 2021 are provided in Appendix A. The energy efficiency of each model is assessed based upon its particular suite of functions and capabilities, which vary widely. The overall trend in the average weighted power of each of the three categories of SNE defined by the Voluntary Agreement is shown in Table 2.

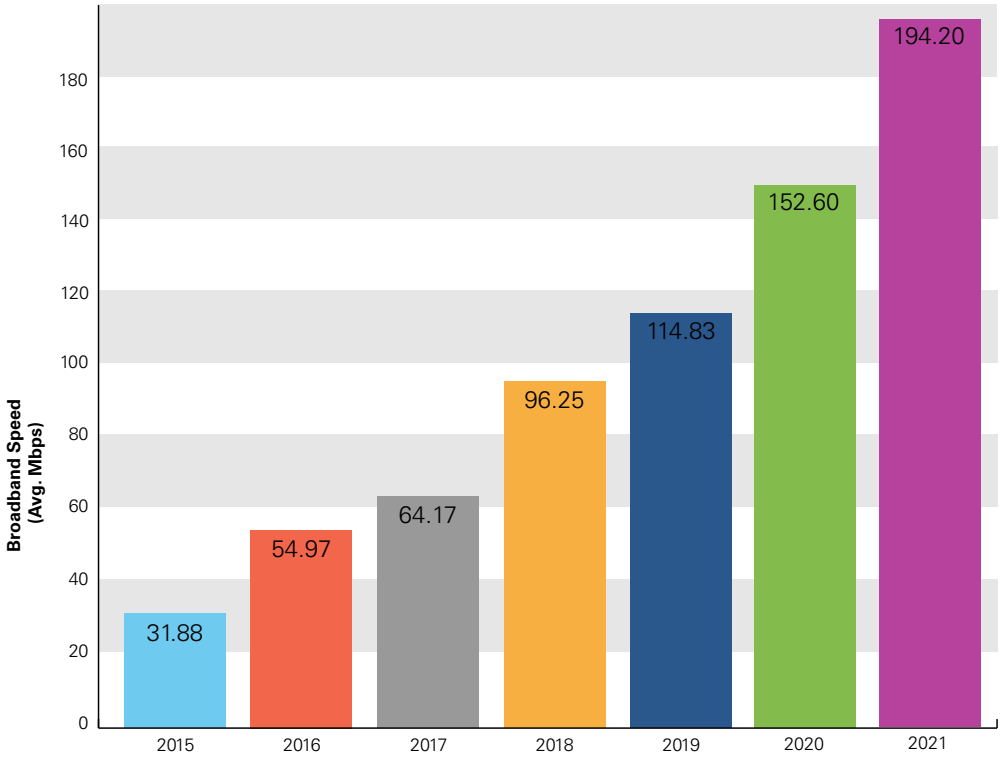
Table 2: Average Weighted Idle Mode Power Consumption for Small Network Equipment Categories 2015-2021

SNE Category	Average Weighted Power (in Watts)						
	2015	2016	2017	2018	2019	2020	2021
Broadband Modem	6.67	7.11	8.12	9.36	9.65	9.43	9.76
Integrated Access Device	13.30	13.53	13.65	13.73	14.49	13.87	13.51
Local Network Equipment	6.44	5.62	5.28	6.79	7.64	7.21	7.55
Total Weighted Average	**11.36**	**11.79**	**11.26**	**11.55**	**12.59**	**11.49**	**11.49**

The increases in nominal power of the SNE categories since 2015 can be attributed to the power requirements of supporting much faster broadband speeds and stronger Wi-Fi. The signatories have made improvements to deliver these new functionalities more efficiently over time. Despite increased demand for faster speeds and increased functionality, the total average weighted power did not increase from 2020 to 2021, as shown in Table 2.

Consumers are bringing an increasing number and variety of connected devices into their homes and streaming an increasing amount of video content to mobile devices. In the home, this streamed content is typically delivered through the consumer's SNE. To support these devices and content, the average broadband connection speed for U.S. residential households has increased more than sixfold in just six years, as shown in Figure 3.

Figure 3: Annual Growth of Fixed Consumer Broadband Download Speeds[8]



8 - For purposes of consistency with prior reports, the data for each year is based upon the mean fixed broadband speed data available from the second quarter of each year. For 2016-2018, mean fixed broadband data was taken from Ookla, *Speedtest® Market Reports 2016, 2017, 2018* (August 3, 2016; September 7, 2017; December 12, 2018), https://www.speedtest.net/insights. For 2019, data was taken from MCKETTA, ISLA. *In-Depth Analysis of Changes in World Internet Performance Using the Speedtest Global Index 2019* (September 4, 2019), https://www. speedtest.net/insights/blog/global-index-2019-internet-report/. For 2020-2021, data was taken from Ookla, *Speedtest® United States' Mobile and Fixed Broadband Internet Speeds* (Q2 2020 and Q2 2021), https://www.speedtest.net/global-index/united-states?fixed#market-analysis.

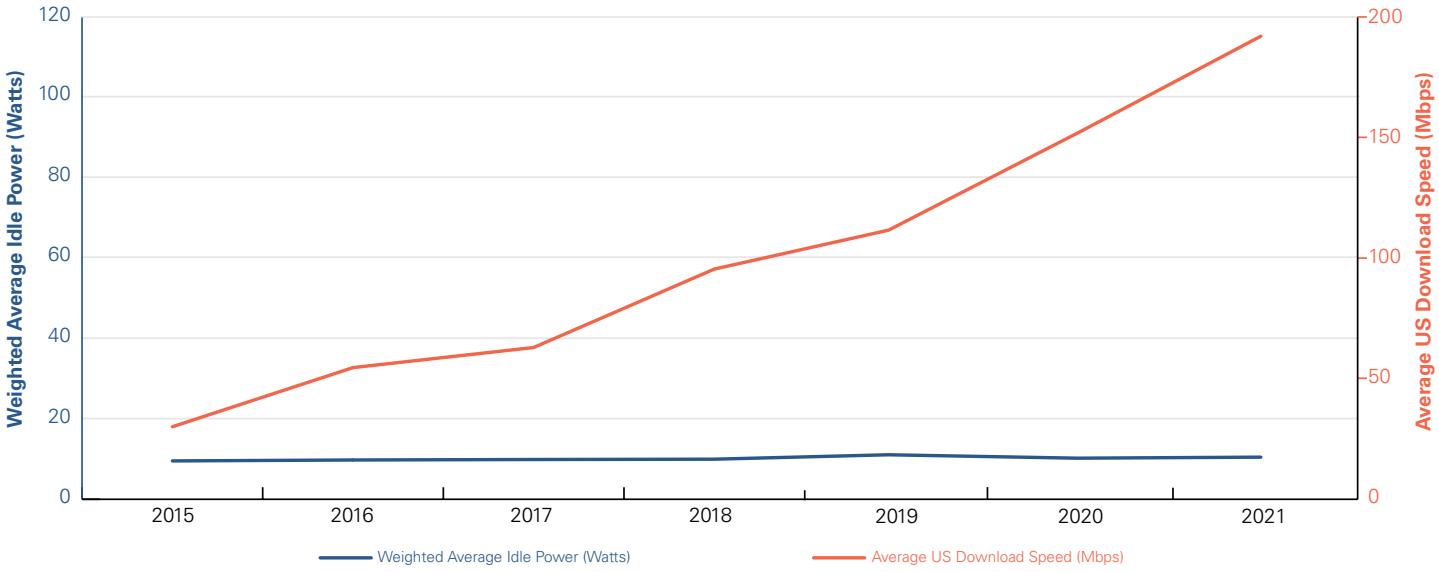
To meet consumers' increased demands for higher-speed broadband services and increased Wi-Fi capacity in the home, the design and features of SNE have changed since the Voluntary Agreement was adopted. New WAN technologies such as DOCSIS 3.1, new Wi-Fi technologies such as Wi-Fi 6, and higher-powered radios with more antennas and MIMO spatial streams, can require more power.

Moreover, for years, the signatories strive to provide equipment that will be capable of supporting the speeds and services that their customers are predicted to want over the next several years, not just current demand. Service providers wish to give customers the opportunity to upgrade their Internet service without having to wait for a service provider technician to visit and replace their equipment. In addition, it would be environmentally- and economically-wasteful to procure new SNE today that would be quickly rendered obsolete by changes in consumer demand. As a result, SNE is designed and manufactured to support more demanding speeds and capabilities prior to their widespread adoption by consumers.

The practice of embedding future expandable capability into deployed Internet equipment continued to pay large dividends for American society as the COVID-19 pandemic prolonged into 2021. Service provider networks and SNE on which they rely, supported the massive, immediate surge in Internet usage in 2020 as millions of Americans all began working, attending school, engaging in telehealth, and seeking out ways to stay connected and entertained from home. The stay-at-home dynamic continued throughout 2021, and Americans made accommodations for transitioning to long-term remote everyday life. Throughout the first two years of the pandemic, service providers were generally able to continue to increase speeds for consumers without having to enter homes to upgrade their SNE.

SNE energy usage is accordingly evaluated relative to its capabilities. Average energy relative to broadband speed decreased from 2020 to 2021 as it has each year under the Voluntary Agreement, as shown in Figure 1 of this report. Figure 4 below illustrates the contrast between the relative stability of the weighted average idle power consumption of reported SNE and the rapid increase in average download speeds during the six years of the Voluntary Agreement. The signatories' ability to support these higher-speed services without a significant overall increase in power consumption demonstrates that their SNE devices are delivering services more efficiently, and thereby, are accomplishing the core objectives of the Voluntary Agreement.

Figure 4: Weighted Average Idle Power of Small Network Equipment Devices vs. Average Download Speed 2015-2021



To continue to meet consumer demands for higher broadband speeds in the future, the signatories will need to offer devices with greater functionality than those offered today, while still meeting the commitments of the Voluntary Agreement. With new Tier 3 levels scheduled to become applicable in 2023, the Voluntary Agreement is expected to continue to drive purchase and retail decisions, increasing the efficiency of equipment in the market and in consumers' homes.

The data supports the finding that the Voluntary Agreement is continuing to be successful in improving the energy efficiency of SNE.

Lab Verification Testing

Per the Voluntary Agreement, the Independent Administrator is tasked with randomly selecting one model from each commercial signatory for lab verification testing. Lab verification testing is conducted in third-party laboratories approved by the Steering Committee or under a supervised signatory testing program with an accredited independent observer approved by the Steering Committee. Test results are compared to the reported value as well as the maximum idle power consumption under the applicable allowances for that device.

The lab verification testing is typically conducted in the spring following the end of the reporting period. Unfortunately, travel and resource restrictions due to COVID-19 continued to impact the ability for this testing to be conducted. As a result, lab verification testing was waived for the 2021 reporting period.

Consumer Access to Energy-Efficiency Information

All signatories committed to provide subscribers and prospective customers with reasonable access to energy-efficiency information for SNE purchased or sold at retail. This information makes it easy for consumers to learn about energy consumption of recent models. Links to the information are shown in Appendix B and posted at www.energy-efficiency.us.

CONCLUSION

The Voluntary Agreement continues to be successful in improving the energy efficiency of SNE used by American consumers to access home broadband Internet service. 98.2% of reported units satisfied the Tier 2 energy-efficiency levels of the Agreement despite increased consumer demands for robust capabilities that consume power. All but one of the signatories met the 90% threshold, and most of the signatories had 100% of their new sales and purchases meet the energy-efficiency levels. The average weighted power of each category of new SNE relative to broadband speed delivered has decreased by up to 83% and has declined every year under the Voluntary Agreement. As the signatories continue to employ even greater functionality in their devices while still meeting the energy-efficiency levels of the Agreement, and with an expanded group of signatories working toward implementation of the more stringent Tier 3 levels by 2023, the Voluntary Agreement can be expected to continue to promote both product innovation and energy efficiency.

APPENDIX A: SMALL NETWORK EQUIPMENT PURCHASED OR SOLD BY VOLUNTARY AGREEMENT SIGNATORIES IN 2021

Appendix A lists SNE reported by the signatories as purchased or sold in 2021. Please note that the same model 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 in the device by different signatories. 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).

Vendor reports include only the models that were sold via retail channels. Models sold to service providers are reported by the service providers.

The Voluntary Agreement establishes the following categories of SNE subject to the Agreement:

- **Broadband Modem.** A simple network device that enables 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 Device (IAD).** A network device that enables high-speed data service with 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, IEEE 802.11 (Wi-Fi) wireless access point functionality, and/or VoIP.
- **Local Network Equipment (LNE).** The following local network devices that do not have a direct interface to a Service Provider wired or optical network:
    - **Wireless Access Point:** A device that typically includes one or more Ethernet interfaces, and that provides IEEE 802.11 (Wi-Fi) wireless network connectivity to multiple clients as its primary function.
    - **Router:** A network device that forwards packets from one network interface to another based on network layer information (typically IP destination address). Devices fitting this definition may provide both wired and wireless network connectivity.
    - **Switch:** A network device that filters and forwards frames based on the Ethernet destination MAC address of each frame as its primary function.
    - **Network Extender:** A device that bridges or extends a local area network beyond its physical limitations using one or more transmission media such as twisted pair, coax, Wi-Fi, or powerline.

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
Altice USA	AlticeLabs	GR140DG	IAD SFP GPON	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, FXS, USB 2	8.50	Yes
Altice USA	Ubee	UBC1326	IAD D3.1	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), FXS, USB 3	12.00	Yes
Altice USA	ARRIS	TM1602G	IAD D3.0	D3 above 4x4(5), GigE LAN, FXS(2), BATTERY	10.50	Yes
Altice USA	Ubee	UBC1322	IAD D3.1	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), FXS(2)	11.00	Yes
Altice USA	Ubee	UBC1319	IAD D3.0	D3 above 4x4(5), GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), FXS, USB 2	14.00	Yes
ASUS	ASUS	Blue Cave	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 3, Bluetooth, PCIe(2)	12.90	No
ASUS	ASUS	CM-32	IAD D3.0	D3 above 4x4(7), GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 2(2), PCIe(2)	13.50	Yes
ASUS	ASUS	CMAX6000	IAD D3.1	D3 above 4x4(7), GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe(2)	12.67	Yes
ASUS	ASUS	CT8	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, PCIe, AP 5K-10K DMIPS	8.73	Yes
ASUS	ASUS	ET8	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, PCIe, AP 5K-10K DMIPS	9.00	Yes
ASUS	ASUS	GS-AX3000	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.50	Yes
ASUS	ASUS	GS-AX5400	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.90	Yes
ASUS	ASUS	GT-AC2900	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	10.34	Yes
ASUS	ASUS	GT-AC5300	Advanced LNE	GigE LAN(9), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, USB 3(2), PCIe(3), AP 5K-10K DMIPS	14.31	Yes
ASUS	ASUS	GT-AX11000	Advanced LNE	GigE LAN(6), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, USB 3(2), PCIe(3), AP 5K-10K DMIPS	13.21	Yes
ASUS	ASUS	GT-AX6000	Advanced LNE	GigE LAN(6), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	11.50	Yes
ASUS	ASUS	GT-AXE11000	Advanced LNE	GigE LAN(6), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, USB 3(2), PCIe(3), AP 5K-10K DMIPS	13.60	Yes
ASUS	ASUS	LYRA VOICE	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, Bluetooth, PCIe, AP 5K-10K DMIPS	7.40	Yes
ASUS	ASUS	RP-AC1900	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, PCIe(2), AP 5K-10K DMIPS	9.04	Yes
ASUS	ASUS	RP-AC51	Advanced LNE	Fast E LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP	2.51	Yes
ASUS	ASUS	RP-AC55	Advanced LNE	GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, Bluetooth	2.90	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
ASUS	ASUS	RP-AX56	Advanced LNE	GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, AP 5K-10K DMIPS	3.20	Yes
ASUS	ASUS	RP-N12	Advanced LNE	Fast E LAN, Wi-Fi (n) LP	1.60	Yes
ASUS	ASUS	RT-AC1200	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) LP, USB 2	3.50	Yes
ASUS	ASUS	RT-AC1200_V2	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) LP	2.32	Yes
ASUS	ASUS	RT-AC1200GE	Advanced LNE	GigE LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) HP, USB 2	4.86	Yes
ASUS	ASUS	RT-AC1900P	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	11.90	No
ASUS	ASUS	RT-AC3100	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	14.10	No
ASUS	ASUS	RT-AC3200	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 2, USB 3, PCIe(3), AP 5K-10K DMIPS	12.94	Yes
ASUS	ASUS	RT-AC5300	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, USB 2, USB 3, PCIe(3), AP 5K-10K DMIPS	16.53	No
ASUS	ASUS	RT-AC65	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3	4.96	Yes
ASUS	ASUS	RT-AC66U B1	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	9.49	Yes
ASUS	ASUS	RT-AC67P	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3	4.96	Yes
ASUS	ASUS	RT-AC68U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	10.19	Yes
ASUS	ASUS	RT-AC68U V3	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	8.74	Yes
ASUS	ASUS	RT-AC86U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	10.72	Yes
ASUS	ASUS	RT-AC88U	Advanced LNE	GigE LAN(9), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	15.80	No
ASUS	ASUS	RT-ACRH12	Advanced LNE	GigE LAN(5), Wi-Fi (n) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (ac) HP, USB 2	4.86	Yes
ASUS	ASUS	RT-ACRH13	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3	4.50	Yes
ASUS	ASUS	RT-ACRH17	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	5.95	Yes
ASUS	ASUS	RT-ACRH18	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3	4.96	Yes
ASUS	ASUS	RT-AX1800S	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, AP 5K-10K DMIPS	6.11	Yes
ASUS	ASUS	RT-AX3000	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.10	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
ASUS	ASUS	RT-AX55	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, AP 5K-10K DMIPS	5.00	Yes
ASUS	ASUS	RT-AX56U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 2, USB 3, AP 5K-10K DMIPS	5.40	Yes
ASUS	ASUS	RT-AX58U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.10	Yes
ASUS	ASUS	RT-AX68U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	8.50	Yes
ASUS	ASUS	RT-AX82U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.50	Yes
ASUS	ASUS	RT-AX86S	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 2, USB 3, PCIe(2), AP 5K-10K DMIPS	8.20	Yes
ASUS	ASUS	RT-AX86U	Advanced LNE	GigE LAN(6), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 3(2), PCIe(2), AP 5K-10K DMIPS	8.75	Yes
ASUS	ASUS	RT-AX88U	Advanced LNE	GigE LAN(9), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 3(2), PCIe(2), AP 5K-10K DMIPS	11.40	Yes
ASUS	ASUS	RT-AX89X	Advanced LNE	SFP Backup WAN Present, GigE LAN(10), Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(6), Wi-Fi (n) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3(2), AP 5K-10K DMIPS	12.00	Yes
ASUS	ASUS	RT-AX92U	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, PCIe(3), AP 5K-10K DMIPS	10.80	Yes
ASUS	ASUS	RT-N12 D1	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP	2.49	Yes
ASUS	ASUS	RT-N300 B1	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP	1.85	Yes
ASUS	ASUS	TUF-AX5400	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, PCIe, AP 5K-10K DMIPS	6.99	Yes
ASUS	ASUS	XD4	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, AP 5K-10K DMIPS	5.40	Yes
ASUS	ASUS	XD6	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, PCIe, AP 5K-10K DMIPS	6.50	Yes
ASUS	ASUS	XT8	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, PCIe, AP 5K-10K DMIPS	9.08	Yes
AT&T	ARRIS	BGW210-700	IAD VDSL2	GigE Backup WAN, VDSL2 Simul WAN, GigE LAN(4), Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (n) HP, Wi-Fi above 2x2 HP, 802.11n 256 QAM, FXS(2), USB 2(2), PCIe, AP 5K-10K DMIPS	14.50	Yes
AT&T	Airties	4921	Advanced LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, PCIe(2)	7.70	Yes
AT&T	Airties	4971	Advanced LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, PCIe(2)	7.70	Yes
AT&T	Nokia	BGW320-505	IAD SFP GPON	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(6), 802.11n 256 QAM, FXS(2), USB 2, PCIe(3), AP 5K-10K DMIPS	12.60	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
AT&T	Nokia	BGW320-505	IAD GigE	SFP Backup WAN Not Present, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(6), 802.11n 256 QAM, FXS(2), USB 2, PCIe(3), AP 5K-10K DMIPS	10.70	Yes
AT&T	Humax	BGW320-500	IAD SFP GPON	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(6), 802.11n 256 QAM, FXS(2), USB 2, PCIe(3), AP 5K-10K DMIPS	13.60	Yes
AT&T	Humax	BGW320-500	IAD GigE	SFP Backup WAN Not Present, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(6), 802.11n 256 QAM, FXS(2), USB 2, PCIe(3), AP 5K-10K DMIPS	12.70	Yes
Charter	Technicolor	ET2251	IAD D3.1	GigE LAN, FXS(2)	10.50	Yes
Charter	Hitron	EN2251	IAD D3.1	GigE LAN, FXS(2)	10.00	Yes
Charter	Ubee	EU2251	IAD D3.1	GigE LAN, FXS(2)	10.00	Yes
Charter	Sercomm	ES2251	IAD D3.1	GigE LAN, FXS(2)	11.00	Yes
Charter	AdTran	C1004	Basic 10G EPON	GigE LAN(4)	9.00	Yes
Charter	Sagemcom	SONUV1S	Basic 10G EPON	GigE LAN(2), FXS(2)	7.00	Yes
Charter	CommScope	SAC2V1A	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe(3), AP 5K-10K DMIPS	8.00	Yes
Charter	Askey	SAC2V1K	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe(3), AP 5K-10K DMIPS	8.00	Yes
Charter	Sagemcom	SAC2V2S	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe(3), AP 5K-10K DMIPS	8.00	Yes
Charter	Askey	SAX1V1K	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe, AP 5K-10K DMIPS	10.00	Yes
Charter	Sercomm	SAX1V1R	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe, AP 5K-10K DMIPS	10.00	Yes
Charter	Sagemcom	SAX1V1S	Advanced LNE	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, PCIe(3), AP 5K-10K DMIPS	10.00	Yes
Comcast	Technicolor	CGM4331COM	IAD D3.1	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, MoCA, FXS(2), Bluetooth, ZigBee, PCIe(2), AP 5K-10K DMIPS	17.00	Yes
Comcast	CommScope	TG4482A	IAD D3.1	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, MoCA, FXS(2), Bluetooth, ZigBee, PCIe(2), AP 5K-10K DMIPS	24.50	Yes
Comcast	Sagemcom	B1A	Basic LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe(3)	6.50	Yes
CommScope	ARRIS	G34	IAD D3.1	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, PCIe(2)	14.10	Yes
CommScope	ARRIS	G36	IAD D3.1	GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, PCIe(2)	14.50	Yes
CommScope	ARRIS	S33	Basic D3.1	GigE LAN(2)	8.30	Yes
CommScope	ARRIS	SB6183	Basic D3.0	D3 above 4x4(3), GigE LAN	8.45	Yes
CommScope	ARRIS	SB6190	Basic D3.0	D3 above 4x4(7), GigE LAN	8.60	Yes
CommScope	ARRIS	SB8200	Basic D3.1	GigE LAN(2)	10.80	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
CommScope	ARRIS	SBG10	IAD D3.0	D3 above 4x4(3), GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP	10.60	Yes
CommScope	ARRIS	SBG6950AC2	IAD D3.0	D3 above 4x4(3), GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(2), USB 2	11.10	Yes
CommScope	ARRIS	SBG7400AC2	IAD D3.0	D3 above 4x4(5), GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(3), USB 2	13.20	Yes
CommScope	ARRIS	SBG7600AC2	IAD D3.0	D3 above 4x4(7), GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(3), USB 2, PCIe(2), AP 5K-10K DMIPS	14.20	Yes
CommScope	ARRIS	SBG8300	IAD D3.1	GigE LAN(4), Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (n) HP, Wi-Fi above 2x2 HP, AP 5K-10K DMIPS	18.20	Yes
CommScope	ARRIS	SBV2402	IAD D3.0	D3 above 4x4(5), GigE LAN, FXS(2)	7.80	Yes
CommScope	ARRIS	SBV3202	IAD D3.0	D3 above 4x4(7), GigE LAN, FXS(2)	9.20	Yes
CommScope	ARRIS	SVG2482AC	IAD D3.0	D3 above 4x4(5), GigE LAN(4), Wi-Fi (n) LP, Wi-Fi above 2x2 LP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, MoCA, FXS(2), USB 2(2)	14.30	Yes
CommScope	ARRIS	T25	IAD D3.1	GigE LAN(2), FXS(2)	9.40	Yes
CommScope	ARRIS	TM1602AP2	IAD D3.0	D3 above 4x4(3), GigE LAN, FXS(2)	8.00	Yes
CommScope	ARRIS	W11	Basic LNE	Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(2), PCIe	5.80	Yes
CommScope	ARRIS	W21	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), PCIe	7.50	Yes
CommScope	ARRIS	W30	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), PCIe(3)	10.80	Yes
CommScope	ARRIS	W31	Advanced LNE	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), PCIe(3)	11.00	Yes
CommScope	ARRIS	WC4T	Advanced LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(3), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), PCIe(2)	6.30	Yes
Cox	Technicolor	CGM4141	IAD D3.1	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(6), 802.11n 256 QAM, MoCA, FXS(2), Bluetooth, ZigBee, Z-wave, PCIe(2), AP 5K-10K DMIPS	24.00	Yes
Cox	Technicolor	CGM4331	IAD D3.1	GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, MoCA, FXS(2), Bluetooth, ZigBee, PCIe(2), AP 5K-10K DMIPS	17.50	Yes
Cox	Sagemcom	B1A	Basic LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe(3)	6.50	Yes
Cox	ARRIS	CM8200A/P2	Basic D3.1	GigE LAN(2)	12.00	Yes
Cox	ARRIS	TM3402A	IAD D3.1	GigE LAN(4), FXS(2)	11.60	Yes
Frontier	CommScope	NVG468 MQ	IAD GigE	GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(3), MoCA, FXS(2), USB 3, PCIe, AP 5K-10K DMIPS	12.70	Yes
Frontier	CommScope	NVG448 B	IAD VDSL2	GigE Backup WAN, VDSL2 Simul WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP, FXS(2), USB 3, PCIe(2), AP 5K-10K DMIPS	12.60	Yes
Frontier	CommScope	NVG443 B	IAD VDSL2	GigE Backup WAN, VDSL2 Simul WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP, USB 3, PCIe(2), AP 5K-10K DMIPS	12.60	Yes
Frontier	Frontier	FCA251	Basic LNE	GigE LAN, MoCA	1.88	Yes
Frontier	Frontier	FCA252	Basic LNE		1.88	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
Frontier	eero	eero Pro 6	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, Bluetooth, ZigBee, AP 5K-10K DMIPS	8.75	Yes
Linksys	Linksys	E2500 V4	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) LP	2.90	Yes
Linksys	Linksys	E5350	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) LP	2.90	Yes
Linksys	Linksys	E5400	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) LP	2.90	Yes
Linksys	Linksys	E5600	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) LP	4.62	Yes
Linksys	Linksys	E7350	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	5.19	Yes
Linksys	Linksys	E8450, RT3200	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	6.37	Yes
Linksys	Linksys	E9450	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	9.08	Yes
Linksys	Linksys	EA6100	Advanced LNE	Fast E LAN(5), Wi-Fi (n) LP, Wi-Fi (ac) HP, USB 2	2.95	Yes
Linksys	Linksys	EA6350 V3	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	5.47	Yes
Linksys	Linksys	EA7200	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	5.48	Yes
Linksys	Linksys	EA7300 V2	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3	5.48	Yes
Linksys	Linksys	EA7430	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	6.29	Yes
Linksys	Linksys	EA7450	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP, 802.11n 256 QAM, USB 3	6.29	Yes
Linksys	Linksys	EA7500 V2	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3	6.29	Yes
Linksys	Linksys	EA8100	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3	6.29	Yes
Linksys	Linksys	EA8300	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(3), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	6.19	Yes
Linksys	Linksys	LGS105V2	Basic LNE	GigE LAN(5)	1.36	Yes
Linksys	Linksys	LGS108V2	Basic LNE	GigE LAN(8)	0.60	Yes
Linksys	Linksys	LGS108PV2	Basic LNE	GigE LAN(8)	1.55	Yes
Linksys	Linksys	MR5500	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	6.89	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
Linksys	Linksys	MR6350	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	5.51	Yes
Linksys	Linksys	MR7310	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	7.24	Yes
Linksys	Linksys	MR7320	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	7.24	Yes
Linksys	Linksys	MR7340	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	7.24	Yes
Linksys	Linksys	MR7350	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	7.24	Yes
Linksys	Linksys	MR7500	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	11.83	Yes
Linksys	Linksys	MR8300	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	6.19	Yes
Linksys	Linksys	MR9000	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	7.92	Yes
Linksys	Linksys	MR9600 V2	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	14.49	No
Linksys	Linksys	MR9610 V2	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, AP 5K-10K DMIPS	14.49	No
Linksys	Linksys	MX10600	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	12.39	Yes
Linksys	Linksys	MX12600	Advanced LNE	GigE Backup WAN, GigE LAN(3), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	10.33	Yes
Linksys	Linksys	MX5300	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	12.39	Yes
Linksys	Linksys	MX8000	Advanced LNE	GigE Backup WAN, GigE LAN(3), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	10.33	Yes
Linksys	Linksys	MX8400	Advanced LNE	GigE Backup WAN, GigE LAN(3), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 3, Bluetooth, AP 5K-10K DMIPS	10.33	Yes
Linksys	Linksys	RE6300 V2	Advanced LNE	GigE LAN, Wi-Fi (n) LP, Wi-Fi (ac) LP	3.82	Yes
Linksys	Linksys	RE7000 V2	Advanced LNE	GigE LAN, Wi-Fi (n) LP, Wi-Fi (ac) LP, Wi-Fi above 2x2 LP	4.28	Yes
Linksys	Linksys	RE7310	Advanced LNE	Wi-Fi (n) LP, Wi-Fi (ac) LP, 802.11n 256 QAM	4.36	Yes

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
Linksys	Linksys	RE7350	Advanced LNE	Wi-Fi (n) LP, Wi-Fi (ac) LP, 802.11n 256 QAM	4.36	Yes
Linksys	Linksys	SE3005 V2	Basic LNE	GigE LAN(5)	0.46	Yes
Linksys	Linksys	SE3008 V2	Basic LNE	GigE LAN(8)	0.60	Yes
Linksys	Linksys	VLP0101	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, AP 5K-10K DMIPS	4.77	Yes
Linksys	Linksys	WHW0101	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee, AP 5K-10K DMIPS	4.77	Yes
Linksys	Linksys	WHW0102	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee, AP 5K-10K DMIPS	4.77	Yes
Linksys	Linksys	WHW0103	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee, AP 5K-10K DMIPS	4.77	Yes
Linksys	Linksys	WHW0101P	Advanced LNE	Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, AP 5K-10K DMIPS	3.53	Yes
Linksys	Linksys	WHW0301	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee	5.14	Yes
Linksys	Linksys	WHW0302	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee	5.14	Yes
Linksys	Linksys	WHW0303	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee	5.14	Yes
Linksys	Linksys	A0302	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee	5.14	Yes
Linksys	Linksys	A0303	Advanced LNE	GigE Backup WAN, GigE LAN, Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, Bluetooth, ZigBee	5.14	Yes
Linksys	Linksys	WRT3200ACM	Advanced LNE	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), 802.11n 256 QAM, USB 2, USB 3, SATA, AP 5K-10K DMIPS	3.47	Yes
Lumen	Actiontec	C3000A	IAD VDSL2	VDSL2 Simul WAN, GigE LAN(5), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(3), USB 2, PCIe(2)	13.00	Yes
Lumen	Zyxel	C3000Z	IAD VDSL2 (30a)	GigE Backup WAN, GigE LAN(4), Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(2), Wi-Fi (n) HP, Wi-Fi above 2x2 HP, USB 2	10.40	Yes
Lumen	Zyxel	C3510XZ	IAD GigE	GigE LAN(4), Wi-Fi (n) LP(2), Wi-Fi (ac) LP, Wi-Fi above 2x2 LP(2), Wi-Fi above 2x2 HP, USB 2	8.52	Yes
Lumen	Zyxel	C4000LZ	IAD VDSL2	GigE Backup WAN, GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP	12.14	No
Lumen	Axon	C4000LG	IAD VDSL2	GigE Backup WAN, VDSL2 Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 2, PCIe(3)	11.04	Yes
Lumen	Axon	C4000XG	IAD GigE	SFP Backup WAN Not Present, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(4), 802.11n 256 QAM, USB 2, PCIe(3)	15.40	No
Lumen	Axon	C4000BG	IAD VDSL2	GigE Backup WAN, VDSL2 Simul WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, 802.11n 256 QAM, USB 2, PCIe(3)	14.66	No

Table 3: Small Network Equipment Purchased/Sold by Voluntary Agreement Signatories in 2021 (Cont.)

Signatory	Brand	Model Number	Base Type	Claimed Allowances	Reported Idle Power (W)	Meets Tier 2 VA Levels
Lumen	Axon	C5500XK	IAD SFP GPON	GigE Backup WAN, GigE LAN, USB 3	4.43	Yes
Plume	Plume	PP203X	Basic LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe	6.50	Yes
Plume	Plume	PP403Z	Basic LNE	GigE LAN(2), Wi-Fi (n) LP, Wi-Fi (ac) LP(2), Wi-Fi above 2x2 LP(2), 802.11n 256 QAM, Bluetooth, PCIe	7.50	Yes
Verizon	Actiontec	GT784WNV	IAD ADSL2+	Fast E LAN(4), Wi-Fi (n) LP, USB 2	6.09	No
Verizon	D-Link	DSL-2750B	IAD ADSL2+	Fast E LAN(4), Wi-Fi (n) LP, USB 2	5.05	Yes
Verizon	D-Link	DGS-1005G	Basic LNE	GigE LAN(5)	1.56	Yes
Verizon	Actiontec	WCB6200Q	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), MoCA	9.21	Yes
Verizon	Verizon	FiOS-G1100	IAD MoCA	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP, Wi-Fi above 2x2 HP(2), MoCA, USB 2(2), Z-wave	10.43	Yes
Verizon	Actiontec	ECB5240	Advanced LNE	GigE LAN(4), MoCA	4.91	Yes
Verizon	Arcadyan	Fios Router	IAD MoCA	GigE Backup WAN, GigE LAN(4), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, MoCA, USB 3, Bluetooth, PCIe(3), AP 5K-10K DMIPS	11.78	Yes
Verizon	Arcadyan	Fios Extender	Advanced LNE	GigE LAN(2), Wi-Fi (n) HP, Wi-Fi (ac) HP(2), Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, MoCA, PCIe(3), AP 5K-10K DMIPS	10.12	Yes
Verizon	Verizon	Verizon Router (CR1000A)	IAD GigE	Wi-Fi above 2x2 HP(6), 802.11n 256 QAM, MoCA, USB 3, AP 5K-10K DMIPS	24.00	Yes
Verizon	Verizon	MoCA Ethernet Adapter	Advanced LNE	GigE LAN(3), MoCA	3.97	Yes

Table 4 describes feature allowances established by the Voluntary Agreement.

Table 4: Voluntary Agreement Tier 2 Allowance Descriptions

Description	Descriptor	Allowance
Base Allowance: IAD Devices (by WAN interface) (watts)		
ADSL2plus	IAD ADSL2+	3.7
VDSL2 (8, 12a, 17a, but not 30a)	IAD VDSL2	4.5
VDSL2 (all above profiles including 30a)	IAD VDSL2 (30a)	6.0
DOCSIS 3.0 basic configuration (4x4)	IAD D3.0	6.0
DOCSIS 3.1 No FDX	IAD D3.1	15.1
MoCA 1.1/2.0	IAD MoCA	5.7
Gigabit Ethernet	IAD GigE	4.0
SFP with GPON	IAD SFP GPON	5.0
Base Allowance: Broadband Modems (by WAN Interface) (watts)		
DOCSIS 3.0 basic configuration (4x4)	Basic D3.0	4.5
DOCSIS 3.1 No FDX	Basic D3.1	13.6
10G EPON	Basic 10G EPON	10.0
Base Allowance: LNE (watts)		
LNE other than Advanced LNE	Basic LNE	1.5
Advanced LNE	Advanced LNE	3.5
Adders for Additional Backup WAN Interface		
Gigabit Ethernet WAN	GigE Backup WAN	0.4
SFP Not Present	SFP Backup WAN Not Present	0.7
SFP Present (1000BaseLX/SX or GPON)	SFP Backup WAN Present	2.0
VDSL2 (8, 12a, 17a, but not 30a)	VDSL2 Backup WAN	0.7
Adders for Simultaneous Additional WAN Interface		
VDSL2 (8, 12a, 17a, but not 30a)	VDSL2 Simul WAN	3.2
DOCSIS 3.0 additional power allowance for each additional 4 downstream channels	D3 above 4x4	1.3
Adders for LAN interfaces and Additional Functionality		
1 Fast Ethernet port	Fast E LAN	0.2
1 Gigabit Ethernet port	GigE LAN	0.2
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	1.0
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	1.8
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	0.3
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	1.1
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	2.2
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	0.3
Wi-Fi IEEE 802.11n at 2.4GHz supporting 256-QAM	802.11n 256 QAM	0.5
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
SATA - no load connected	SATA	0.3
Built-in back-up battery	BATTERY	0.4
Bluetooth	Bluetooth	0.5
ZigBee	ZigBee	0.2

Table 4: Voluntary Agreement Allowance Descriptions (Cont.)

Description	Descriptor	Allowance
Z-wave	Z-wave	0.2
PCIe Interface (Connected)	PCIe	0.2
Application Processor 5K-10K DMIPS	AP 5K-10K DMIPS	1.0

APPENDIX B: CONSUMER ACCESS TO SMALL NETWORK EQUIPMENT ENERGY-EFFICIENCY INFORMATION

SNE energy information for consumers is available at www.energy-efficiency.us, and for each service provider and retail vendor at the links below.

Table 5: Consumer Access to Small Network Equipment Energy-Efficiency Information

Signatory	Consumer information Location	Additional Information
Service Providers		
Altice USA	http://energy.cablelabs.com/alticeusa-sne/	
AT&T	https://www.att.com/idpassets/images/support/pdf/ATT-Small-Network-Equipment-Energy-Information-2021.pdf	
Charter	https://www.spectrum.net/support/tv/energy-usage-your-charter-equipment	
Comcast	https://www.xfinity.com/support/articles/internet-equipment-energy-usage	
Cox	https://www.cox.com/residential/support/conserving-energy-with-your-digital-box.html	
Frontier	https://frontier.com/~/media/HelpCenter/Documents/tv/fiber-optic-tv/small-network-equipment-efficiency.ashx	
Lumen	http://www.centurylink.com/home/help/internet/modems-and-routers/modem-energy-efficiency.html (CenturyLink) https://www.quantumfiber.com/support/equipment/modem-energy-efficiency.html (Quantum Fiber)	
Verizon	https://www.verizon.com/support/residential/tv/equipment/stb-dvr	Scroll down to "Learn about Verizon's Small Network Equipment (SNE) Energy Information" and click the plus sign next to it.
Vendors		
Actiontec	https://www.actiontec.com/wp-content/uploads/2019/05/Actiontec_Broadband_Equipment_Energy_Information_SNE_v3.pdf	
ASUS	https://www.asus.com/us/site/SNE-Info/Asus-SNE-Energy-Information-2021.pdf	
CommScope	https://www.commscope.com/globalassets/digizuite/330860-commscope-sne-public-report.pdf	
Linksys	https://www.linksys.com/us/support-article?articleNum=318168	
Plume	https://www.plume.com/homepass/legal?tabId=sneenergyinformation	
Technicolor	No Retail Products	
Ubee Interactive	No Retail Products	
Sagemcom	No Retail Products	

APPENDIX C: 2021 AUDIT REPORT

The Voluntary Agreement requires the service provider and retail vendor signatories to submit annual procurement and sales figures to an Independent Administrator, who collects and analyzes the amounts, then publishes the findings in an annual report. The Administrator aggregates the submissions from the individual signatories for publication in the annual report to protect this highly confidential information. To verify the accuracy of the reported data, the Voluntary Agreement requires an audit of one randomly-selected commercial signatory each year. In accordance with the confidentiality requirements of the Voluntary Agreement, the name of the audited party is not published.

D+R conducted an audit of the 2021 report data provided in 2022, which was used to develop the 2021 Annual Report. As part of the audit process, they randomly selected the party by creating an Excel spreadsheet and using the "random" function. D+R then reviewed raw data, including invoice records and specification sheets, from the selected party to verify the quantities provided in the original submission.

D+R, as the Independent Administrator, has determined that the data submitted by the signatory for the audit is consistent with the annual report submitted by that party.

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