



Federal Trade Commission

E-Cigarette Report

for 2015-2018

ISSUED: 2022

Executive Summary

In 2018, 8.1 million adults in the United States or 3.2% of adults were current e-cigarette users, while 20.8% of high school students and 4.9% of middle school students were current e-cigarette users. Seeing this and other data about the increased popularity of e-cigarette products, particularly among youth, the Federal Trade Commission (“FTC” or “Commission”) decided to study the e-cigarette industry’s domestic sales and marketing, as it has for many decades studied the cigarette and smokeless tobacco industries.

In October 2019, the FTC issued identical Orders to File Special Reports (“Orders”) under Section 6(b) of the FTC Act to six of the country’s largest domestic e-cigarette manufacturers (Fontem US, Inc.; JUUL Labs, Inc.; Logic Technology Development LLC; NJOY, LLC; Nu Mark LLC; and R.J. Reynolds Vapor Company)—comprising virtually all of the e-cigarette market measured by the Nielsen Company. The Orders sought information from these companies as to their e-cigarette sales and advertising and promotional activities for calendar years 2015, 2016, 2017, and 2018. This report presents an aggregated and anonymized summary of the information provided in response to the Commission’s Orders, including information gathered through follow-up questions.

Key Findings

Product Sales and Characteristics

The report shows the dramatic increase between 2015 and 2018 in e-cigarette product sales in general (from \$304.2 million in 2015 to \$2.046 billion in 2018), and sales of cartridge systems such as Juul’s in particular (from \$260 million in 2015, representing 85.5% of total e-cigarette sales, to \$1.969 billion in 2018, representing 96.3% of total e-cigarette sales).

The Commission also found that there was a large shift in popularity from tobacco-flavored e-cigarette products to “other” flavored products using flavors such as fruit, candy, and dessert.

Tobacco flavored e-cigarette cartridges dropped from 47.2% of all cartridges sold or given away in 2015 to 21% in 2018, while sales or free samples of “other” flavored cartridges tripled in just three years from 13.8% in 2015 to 42.1% in 2018. The most popular “other” flavor category was fruit-flavored cartridges, which represented 4.7% of all cartridges sold or given away in 2015 and 29.7% in 2018 – a six-fold increase. The second most popular “other” category was candy and dessert flavors. We observed similar trends with disposable e-cigarettes.

The dramatic increase in flavored products raises serious concerns that such products might have increased youth use of e-cigarette products and facilitated their continued use, resulting in addiction and other harmful effects. A 2018 national survey of high school students found that 68.8% of e-cigarette users used flavored e-cigarettes, with fruit flavors and candy, dessert, or other sweets flavors being the most popular.¹ Research shows that youth identify flavors as a primary reason for e-cigarette use. In a 2016 national survey of middle and high school students, 31% of students who had ever used e-cigarettes stated that the availability of “flavors such as mint, candy, fruit, or chocolate” was a primary reason for using e-cigarettes; among those students who had only used e-cigarettes, 41% cited flavors as a primary reason for use.² The vast majority of adolescents (81% of ever users) used flavored e-cigarettes the first time they tried e-cigarettes.³ In 2018, the then-Commissioner of FDA publicly attributed youth access to flavored tobacco products as a primary

¹ See Kare A. Cullen, *et al.*, *e-Cigarette Use Among Youth in the United States*, 2019, JAMA Online, with Supplementary tables. Published online Nov. 5, 2019, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6865299/> and <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6865299/bin/jama-322-2095-s001.pdf>.

² See James Tsai, *et al.*, *Reasons for Electronic Cigarette Use Among Middle and High School Students - National Youth Tobacco Survey, United States, 2016*, 67:6 Morbidity and Mortality Wkly. Rep. 196, Feb. 16, 2018, <https://www.cdc.gov/mmwr/volumes/67/wr/mm6706a5.htm>.

³ See Bridget K. Ambrose, *et al.*, *Flavored Tobacco Product Use Among US Youth Aged 12-17 Years, 2013-2014*, 314:17 JAMA 1871, Nov. 3, 2015, <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6467270/>.

factor driving e-cigarette use by adolescents.⁴

The data also revealed a large increase in the nicotine concentration of disposable e-cigarettes. In 2015, cartridge-based products were nearly twice as potent in nicotine concentration as disposable products — 47.5 milligrams of nicotine per milliliter of e-liquid (“mg/ml”) vs. 25 mg/ml. Over the following three years, the nicotine concentration of disposable products went up nearly 60%, to 39.5 mg/ml, increasing their addictiveness. The most popular cartridge-based products had even higher nicotine concentrations: between 51 and 61 mg/ml. Nicotine-free cartridges were very unpopular — representing just 0.21% of sales and giveaways in 2015 and just 0.02% in 2018. Increased use of e-cigarette products with high nicotine concentrations raises serious public health and safety concerns for users (including youth and young adults, who are uniquely at risk for long-term, long-lasting effects, including nicotine addiction, from exposing their developing brains to nicotine). The risk for nicotine addiction increases with the attainment of high concentrations of nicotine, dose delivery, and the rate of nicotine absorption.⁵

Advertising and Promotion

The Commission found that expenditures of advertising and promotion more than tripled in three years, from \$197.8 million in 2015 to \$643.6 million in 2018. Public health authorities have concluded that e-cigarette advertising exposure is one of several factors that has contributed to the recent surge in e-cigarette use among youth.⁶

⁴ See U.S. Food and Drug Administration Press Release, *FDA takes new steps to address epidemic of youth e-cigarette use, including a historic action against more than 1,300 retailers and 5 major manufacturers for their roles perpetuating youth access*, Sept. 11, 2018, <https://www.fda.gov/news-events/press-announcements/fda-takes-new-steps-address-epidemic-youth-e-cigarette-use-including-historic-action-against-more>.

⁵ See Department of Health and Human Services, *The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General* (2014), at 109.

⁶ See Wang TN, Gentzke AS, Neff LJ et al., *Characteristics of e-Cigarette Use Behaviors Among U.S. Youth, 2020*; *JAMA Network Open*. 2021. 4(6): e2111336. Doi:10:1001/jamanetworkopen. (June 7, 2021), at 1,2. See also U.S. Department of Health and

Spending on sampling and the distribution of free and deeply discounted e-cigarette products more than doubled over three years from \$23.0 million in 2015 to \$58.2 million in 2018. In 2016, FDA prohibited sampling free e-cigarette products as part of its Deeming Regulation extending its jurisdiction over all tobacco products.⁷ Following the ban on free e-cigarette samples, some companies began offering e-cigarette products for \$1 or some other similar highly discounted price. The sampling ban was specifically aimed at limiting youth access to tobacco products, including e-cigarette products, and these marketing efforts appear to achieve the same result while evading the ban.⁸

Price discounts paid to retailers or wholesalers to reduce the price of e-cigarette products to consumers grew nearly 14-fold over three years from \$11.2 million in 2015 to \$155.1 million in 2018. It is possible that such price discounts could have encouraged youth usage of e-cigarettes. In considering the available studies demonstrating that tobacco use among youth is responsive to price changes, the U.S. Surgeon General concluded that use of price reducing promotions has led to higher rates of tobacco use among youth.⁹

Spending on celebrity endorsers, social media influencers, brand ambassadors, and other endorsers went up nearly 15-fold, from \$288,000 in 2015 to \$4.3 million in 2018. This increased expenditure suggests an attempt by some manufacturers to use newer media to secure lucrative, long-term customers addicted to their e-cigarette products.

Human Services, *Preventing Tobacco Use Among Youth and Young Adults. A Report of the Surgeon General* (2012), at 8 (Major Conclusion 3).

⁷ Deeming Tobacco Products To Be Subject to the Federal Food, Drug, and Cosmetic Act, as Amended by the Family Smoking Prevention and Tobacco Control Act; Restrictions on the Sale and Distribution of Tobacco Products and Required Warning Statements for Tobacco Products, 81 Fed. Reg. 28974 (May 10, 2016).

⁸ *Id.* at 28986.

⁹ U.S. Department of Health and Human Services, *Preventing Tobacco Use Among Youth and Young Adults. A Report of the Surgeon General* (2012), at 530.

I. INTRODUCTION

This is the Federal Trade Commission’s first report on e-cigarette sales, advertising, and promotion. Since 1967, the FTC has published periodic reports containing data on domestic cigarette sales and marketing expenditures by the major U.S. cigarette manufacturers. The Commission has published comparable reports on smokeless tobacco sales and marketing expenditures since 1987.

In February 2019, when it released its Cigarette Report for 2018 and its Smokeless Tobacco Report for 2018, the FTC issued a statement that it “lack[ed] similar data about the rapidly growing market for e-cigarettes, and as a result the FTC’s and the public’s understanding of the overall market for nicotine-based products [wa]s substantially incomplete.”

In October 2019, in order to assist policymakers, the public, and itself to better understand that market, the Federal Trade Commission issued compulsory process orders (“orders”) to six leading domestic e-cigarette manufacturers (“the manufacturers” or “the companies”), requiring them to report detailed information on their e-cigarette sales and advertising and promotional activities for calendar years 2015, 2016, 2017, and 2018.¹⁰

The orders were sent to: Fontem US, Inc.; JUUL Labs, Inc.; Logic Technology Development LLC; NJOY, LLC; Nu Mark LLC; and R.J. Reynolds Vapor Company.¹¹ Fontem

¹⁰ The data contained in the tables appended to this report are also in an electronic spreadsheet available at: <https://www.ftc.gov/ecigarettedata>.

The sales, advertising, and promotional expenditure figures contained in this report and in the electronic spreadsheet are in nominal dollars and have not been adjusted for inflation.

The owners of one manufacturer did not have data from the period before they acquired the company and only reported for 2017 and 2018. Therefore, aggregate data from 2015 and 2016 are not strictly comparable to aggregate data from 2017 and 2018.

¹¹ The recipients were six of the largest domestic e-cigarette manufacturers. As reported in the Winston-Salem Journal, at the end of 2018, Juul Labs, Inc. had a 75.8% market share of convenience store sales, R.J. Reynolds Vapor Company had a 10% share, Nu Mark LLC had a 9% share, Fontem US, Inc., had a 4.4% share, and Logic Technology Development LLC had a 2.6%

US, Inc., a subsidiary of Imperial Brands plc, markets e-cigarette products under the blu brand name. JUUL Labs, Inc. markets the JUUL brand e-cigarette products, and currently is the largest domestic e-cigarette manufacturer in terms of sales. Logic Technology Development LLC, a subsidiary of Japan Tobacco International, markets e-cigarette products under the Logic brand name. NJOY, LLC markets the NJOY brand of e-cigarette products, which were among the first e-cigarette products introduced in the United States. Nu Mark LLC, a subsidiary of Altria Group, Inc., marketed the MarkTen and GreenSmoke brands of e-cigarette products through the end of 2018, at which time it stopped selling e-cigarette products. R.J. Reynolds Vapor Company, a subsidiary of Reynolds American, Inc., markets e-cigarette products under the Vuse brand name.

II. E-CIGARETTE PRODUCT TYPES

E-cigarettes are battery-powered devices that deliver aerosolized e-liquid, usually containing nicotine, when inhaled.¹² They include vape pens and personal vaporizers. Some e-cigarette systems have rechargeable batteries and are refillable. Closed refillable systems (“cartridge systems”) consist of rechargeable devices that use sealed cartridges, pods, or tanks (“cartridges”) pre-filled with e-liquid that are replaced when the e-liquid is used up. Such refill cartridges are usually designed to work with one brand’s or one manufacturer’s products. Open system products are rechargeable devices and have tanks that are manually filled by the user with e-liquid. Generally, an open system device can be filled with e-liquid sold by any entity. Closed non-refillable systems (“disposables”) come pre-filled with e-liquid and have batteries that are not

share. Richard Craver, *Juul Ends 2018 with 76 Percent Market Share*, Winston-Salem J. (Jan. 8, 2019) https://journalnow.com/business/juul-ends-2018-with-76-percent-market-share/article_6f50f427-19ec-50be-8b0c-d3df18d08759.html. These figures were based on data by the Nielsen Company’s participating retailers, which do not include vape shops or online sales.

¹² Although the Commission’s definition of e-cigarettes could include cannabis vaping devices, none of the recipients of the Commission’s orders sold such devices during the period covered by the orders, and the data collected by the Commission do not include information about cannabis vaping devices. As discussed below, the recipients did report selling nicotine-free products.

rechargeable.

III. E-CIGARETTES SOLD AND GIVEN AWAY

As reported in Table 1, total e-cigarette sales of the reporting manufacturers grew from \$304.2 million in 2015, to \$487.8 million in 2016, \$782.3 million in 2017, and \$2.046 billion in 2018. Indirect sales, through retailers, represented 88.3% of total dollar sales in 2015 (\$260 million), 89.4% in 2016 (\$417.3 million), 88.2% in 2017 (\$707.4 million), and 92.1% in 2018 (\$1.969 billion). The companies' direct sales to consumers (e.g., through company websites) grew from \$35.5 million in 2015, to \$50 million in 2016, \$90.6 million in 2017, and \$131.3 million in 2018. Highly discounted sales of products for \$1 or less (which we consider a form of sampling) grew from approximately \$115,000 in 2015 to \$1.6 million in 2016, decreased to \$1.4 million in 2017, and then increased to \$31.3 million in 2018.¹³

The reporting manufacturers' best-selling e-cigarette products have been cartridge system products. As reported in Table 1, sales of such products by the reporting manufacturers increased from \$260 million in 2015 (representing 85.5% of total e-cigarette sales), to \$417.3 million in 2016 (85.5% of total sales), \$707.4 million in 2017 (90.4% of total sales), and \$1.969 billion in 2018 (96.3% of total sales). Sales of disposable, non-refillable e-cigarette products by the reporting manufacturers grew from \$44.2 million in 2015 (representing 14.5% of total e-cigarette sales), to \$68.4 million in 2016 (14% of total sales), \$72.4 million in 2017 (9.3% of total sales), and \$74.7 million in 2018 (3.7% of total sales). During the reporting years, open system products represented less than 0.5% of the sales of the reporting manufacturers. Open system products tend to be sold at specialized vape shops and it is possible that the reporting manufacturers are responsible for only a small fraction of the overall market for such products.

¹³ Commission staff asked the reporting manufacturers to report such sales for \$1 or less separately from indirect and direct sales, although they could have occurred either at retail or directly through company representatives.

Cartridge System Products

Cartridge system products can be distributed as individual devices, individual cartridges, multiple cartridges bundled together, one or more cartridges bundled with one or more devices, or multiple devices bundled together. As reported in Table 2, sales of one or more cartridges by themselves rose from \$197.2 million in 2015, to \$338.2 million in 2016, \$567.2 million in 2017, and \$1.560 billion in 2018. Sales of cartridge and device bundles increased from \$62.1 million in 2015, to \$75.3 million in 2016, \$116.6 million in 2017, and \$240.3 million in 2018. Devices sold by themselves made up 0.2% of cartridge system dollar sales in 2015, 0.9% in 2016, 3.3% in 2017, and 8.5% in 2018.

Direct sales of cartridge system products made up 13.3% of their overall dollar sales in 2015, 11.6% in 2016, 11.8% in 2017, and 6.2% in 2018. Sales for \$1 or less grew from 0.04% of overall dollar sales in 2015 to 0.4% in 2016, declined to 0.2% in 2017, and rose to 1.6% in 2018.

The companies gave away free cartridges and devices.¹⁴ Combined sales and giveaways of cartridges alone grew from 169.3 million cartridges in 2015, to 211.1 million in 2016, 313.6 million in 2017, and 831.3 million in 2018. Combined sales and giveaways of cartridge system devices increased from 7.8 million devices in 2015, to 8.8 million in 2016, 11.8 million in 2017, and 30.5 million in 2018. Giveaways of cartridges declined from 2.7% of cartridges sold or given away in 2015, to 0.8% in 2016, 0.6% in 2017, and 0.4% in 2018. Giveaways of devices declined from 9.4% of devices sold or given away in 2015, to 5.4% in 2016, 1.7% in 2017, and 1.0% in 2018. At the same time, devices sold for \$1 or less (by themselves or with cartridges) grew from 0.4% of devices sold or given away in 2015 to 3.7% in 2016, dipped to 1.5% in 2017, and then increased to 7.6% in

¹⁴ The Commission's definition of E-Cigarette Products given away included all products distributed for free, whether given for free to retailers or wholesalers for subsequent sale to consumers, or given for free to retailers, wholesalers, or consumers through sampling, a free trial promotion, coupons for free product, or otherwise.

2018.¹⁵ Cartridges sold for \$1 or less were 0.2% of cartridges sold or given away in 2015, 1.4% in 2016, 0.9% in 2017, and 0.5% in 2018.

Disposable E-Cigarettes

As reported in Table 3, the reporting companies sold or gave away 7.8 million disposable e-cigarettes to consumers in 2015, 12.9 million in 2016, 15.8 million in 2017, and 17.2 million in 2018. Of those sales and giveaways, indirect sales accounted for 99% in 2015, 98.1% in 2016, 92.2% in 2017, and 89.4% in 2018. Giveaways were 0.2% in 2015, 0.7% in 2016, 0.05% in 2017, and 0.5% in 2018. There were no sales for \$1 or less until 2018, when such sales represented 0.1% of disposables sold or given away.

Open System Products

Table 4 provides information on the sales of open system products. As mentioned above, these products make up a small portion of sales by the reporting manufacturers and likely a small proportion of overall open system sales. Therefore, that table is not being discussed in this report.

IV. CHARACTERISTICS OF E-CIGARETTE PRODUCTS

Flavors

Table 5 reports the flavor characteristics of e-cigarette products sold or given away. The three primary flavor categories reported are tobacco flavors (e.g., absolute tobacco, classic tobacco, Carolina bold, and sweet original); menthol flavors (e.g., bold menthol, wintermint, spearmint, and wintergreen); and “other” flavors. The table provides a breakdown of the “other” flavors. The subcategories include alcohol flavors (e.g., bourbon blend, Havana wine, mimosa, and peach schnapps); beverage flavors (e.g., caramel cafe, java jolt, chai, and lemon tea); candy or dessert flavors (e.g., mint chocolate, lemon poppy seed, apple crumble, and chestnut croissant); fruit flavors (e.g., cherry, strawberry, watermelon, and mixed berry); fruity menthol flavors (e.g. strawberry

¹⁵ Because devices sold for \$1 or less are highly discounted, they comprise a larger percentage of devices sold than their percentage of overall dollar sales.

mint, berry mint, pear mint, and iced fruit); spice flavors (e.g., vanilla, ginger, cinnamon, and aniseed); and other flavors that do not fit in any of the above categories.

In 2015, the most popular flavor of e-cigarette cartridges was tobacco, representing 47.2% of all cartridges sold or given away. Over the following three years, the popularity of tobacco flavored cartridges declined to 39.8% in 2016, 34.3% in 2017, and 21% in 2018. The popularity of menthol-flavored cartridges remained relatively steady: 39% in 2015, 38% in 2016, 36.3% in 2017, and 36.9% in 2018. The percentage of “other” flavored products grew from 13.8% in 2015, to 22.2% in 2016, 29.5% in 2017, and 42.1% in 2018. The most popular “other” flavor category was fruit-flavored, which represented 4.7% of cartridges sold or given away in 2015, 9% in 2016, 15.3% in 2017, and 29.7% in 2018.¹⁶ The second most popular “other” category was candy and dessert flavors.

Similar trends are seen with disposable e-cigarettes. In 2015, the most popular flavor of disposables was tobacco, representing 52.1% of all devices sold or given away. Over the following three years, the popularity of tobacco flavored devices declined to 45.6% in 2016, 38.5% in 2017, and 35.4% in 2018. The popularity of menthol-flavored cartridges remained relatively steady: 26% in 2015, 22.4% in 2016, 25.7% in 2017, and 27.2% in 2018. The percentage of “other” flavored products grew from 22% in 2015, to 31.9% in 2016, 35.8% in 2017, and 37.4% in 2018. The most popular “other” flavor category was fruit-flavored, which represented 22% of disposable devices sold or given away in 2015, 26.8% in 2016, 32% in 2017, and 33.2% in 2018. The second most

¹⁶ Until January 2020, FDA did not specifically limit the manufacture, distribution, or sale of flavored e-cigarette products. In January 2020, FDA amended its enforcement policy guidance such that companies that continued to sell flavored cartridge-based products (other than tobacco and menthol) could face prosecution for failure to have premarket authorization. Thus, this policy would apply to those selling “mint” or “other” flavored products for cartridge-based systems. The amended FDA policy does not apply to disposable or open system products, and companies can continue to sell such products without the limitation on flavors. Given FDA’s amended policy guidance, it is likely that sales for flavored products will change substantially in future years, with fewer sales for flavored products for cartridge-based systems and increased sales for flavored disposable and open system products.

popular “other” flavor category was spice.

Nicotine Concentrations

The Commission asked the reporting companies to provide the nicotine concentrations of each of their products as measured in milligrams of nicotine per milliliter of e-liquid (“mg/ml”). Table 6 reports nicotine concentration in ranges and averages. For cartridge products, the average nicotine concentration remained relatively steady from 2015 through 2017 and then increased in 2018: 47.5 mg/ml in 2015, 47.2 mg/ml in 2016, 46.8 mg/ml in 2017, and 49.4 mg/ml in 2018. There were increases that are more significant in the average nicotine concentrations of disposable products: 25 mg/ml in 2015, 27.1 mg/ml in 2016, 34.5 mg/ml in 2016, and 39.5 mg/ml in 2018.

Bundling

Table 7 provides details regarding the bundling of cartridge system products. The proportion of devices sold or given away together with cartridges declined from 97.1% in 2015, to 95.4% in 2016, 88.1% in 2017, and 63% in 2018. Almost all cartridge system devices sold or given away were not bundled together with additional devices.

In 2015, 95.1% of cartridges were distributed separately from a cartridge system device. This percentage grew to 95.9% in 2016, 96.7% in 2017, and 97.7% in 2018. Approximately 4% to 5% of cartridges sold or given away were distributed without any other cartridges. In 2015, 71.8% of cartridges were sold or given away together with just one other cartridge. That declined to 69.2% in 2016, 58.4% in 2017, and 26.1% in 2018. Although the sizes of bundles distributed (in terms of the number of cartridges in the bundle) grew, few bundles contained more than five cartridges; only 3% in 2017 and 1.1% in 2018 contained more than five.

Table 8 provides details regarding the bundling of disposable e-cigarette products. In 2015 and 2016, 100% of such products were sold or given away individually. In 2017, 7.7% of disposable e-cigarettes were sold or given away in bundles of five, twenty, or one hundred e-cigarettes, and the rest were distributed individually. In 2018, 3.7% of disposable e-cigarettes were

sold or given away in bundles of five and the rest were distributed individually.

V. ADVERTISING AND PROMOTIONAL EXPENDITURES BY CATEGORY

Table 9 shows the annual expenditures of the six reporting manufacturers on e-cigarette advertising and promotion.¹⁷ This table lists the amounts spent on the different types of media advertising (e.g., magazines) and sales promotion activities (e.g., distribution of coupons).¹⁸

The reporting manufacturers spent \$197.8 million on e-cigarette advertising and promotion in 2015, \$271.0 million in 2016, \$278.6 million in 2017, and \$643.6 million in 2018.¹⁹

Spending on television advertising, which was \$18.8 million in 2015, declined to \$13.7 million in 2016 and \$6.0 million in 2017, before increasing to \$7.6 million in 2018. This category includes advertising on broadcast, cable, and satellite television channels, Internet television (e.g., Hulu, Netflix, Amazon Prime), and webisodes, but does not include product placement.

No company reported advertising e-cigarettes before or during movies.

The Commission asked about radio advertising, including Internet radio, audio streaming services (e.g., Pandora and Spotify), and podcasts. The manufacturers reported spending \$1.9 million on radio advertising for e-cigarettes in 2015, which decreased to \$1.5 million in 2016 and \$1.3 million in 2017, before increasing to \$4.5 million in 2018.

The companies did not report any expenditures in 2015 and 2016 on other audio-visual

¹⁷ The reported figures include all advertising and promotional expenditures related to e-cigarettes, regardless of whether such expenditures would constitute “commercial speech” or would be protected from law enforcement action under the First Amendment. They do not include the costs of employing full-time company employees or any overhead expenses attributable to the activities of such company employees.

¹⁸ Numerous expenditures could have been reported in more than one expenditure category. The Orders instructed the manufacturers in which category to report an expenditure when it fell in multiple categories, but often told them to do so “to the extent practicable.” The Orders also said that expenditures should be included in only one category to the extent practicable.

¹⁹ Definitions of the advertising and promotional expenditure categories appear in the Appendix to this report.

advertising, which the Commission defined as audio and/or visual advertising other than TV, movie, or radio advertising, product placement, social media, endorsements, or transit advertising. It could include advertising on screens or monitors in commercial establishments, such as video arcades or retail shops, and video games. The Commission is not reporting the amount spent on other audio-visual advertising in 2017 or 2018 because, as in each of those years, only one company reported spending in that category.²⁰

In 2016, the manufacturers reported spending \$113,000 on product placement in the creative content of any program or performance.²¹ The Commission is not reporting product placement expenditures in 2015, 2017, or 2018.

The companies reported spending \$5.2 million in 2015 on their websites directed to persons located in the United States. Internet website expenditures increased to \$7.9 million in 2016, \$8.9 million in 2017, and \$11.6 million in 2018.

The Commission inquired about advertising on company-controlled social media accounts or channels (e.g., Facebook, Twitter, Instagram, Snapchat, Reddit, and YouTube) directed to persons located in the United States, including company-authored posts and replies, and re-posts of other users' content. The category excludes expenses related to celebrities, social media influencers, or other endorsers. Expenditures in this category decreased from \$779,000 in 2017 to

²⁰ If only one company reported spending money on a particular type of advertising or promotion in a year, the Commission is not reporting that expenditure in order to avoid potential disclosure of individual company data. For this reason, the Commission is not separately reporting the amounts spent in certain years on "other audio-visual" advertising, product placement, social media, direct mail marketing, newspaper advertising, transit advertising, retail-value-added promotions involving items other than e-cigarette products, branded specialty item distribution, public entertainment in adult-only facilities, and consumer engagement that took place outside of adult-only facilities.

In Table 9, "NA" appears where the Commission is not reporting the expenditure in a category for this reason. The unreported expenditures are included in the "Other" category.

²¹ All advertising and promotion expenditures discussed in the text of the report that are less than one million dollars are rounded to the nearest one thousand dollars. The precise expenditures are reported in Table 9.

\$577,000 in 2018. The Commission is not reporting social media expenditures in 2015 or 2016.

The reporting category “other Internet and digital advertising” could include, among other things, banner, display, pop-up, and native advertising on third-party Internet sites, search advertising, sponsored digital content, advertising using a short message service (SMS text), multimedia (MMS) messaging, instant messaging (IM), direct messaging (DM), and advertising viewed in apps or video games. The reporting manufacturers spent \$6.4 million on other Internet and digital advertising in 2015, \$8.9 million in 2016, \$12.4 million in 2017, and \$22.3 million in 2018.

The companies spent \$288,000, \$104,000, \$4.4 million, and \$4.3 million to procure endorsements of e-cigarette products by a celebrity, social media influencer, brand ambassador, or other endorser in 2015, 2016, 2017, and 2018, respectively.

The manufacturers spent \$1.3 million on direct mail marketing in 2017, which increased to \$4.3 million in 2018. The Commission is not reporting direct mail marketing expenditures in 2015 and 2016. Email marketing expenditures for e-cigarettes were \$67,000 in 2015, \$226,000 in 2016, \$153,000 in 2017, and \$430,000 in 2018.

The companies reported no newspaper advertising expenditure in 2015, 2016, or 2017. Only one of them had newspaper advertising expenditures in 2018, so the Commission is not reporting those expenditures.

The amount reported on magazine advertising of e-cigarettes rose from \$2.5 million in 2015 to \$7.1 million in 2016, declined to \$4.9 million in 2017, and increased to \$5.2 million in 2018. This category includes advertising appearing in digital editions of magazines that are nearly identical to print editions.

Expenditures on outdoor advertising rose from \$969,000 in 2015 to \$2.8 million in 2016. They then declined from \$2.9 million in 2017 to \$1.0 million in 2018. Outdoor advertising includes billboards; signs and placards in arenas, stadiums, and shopping malls, whether any of the foregoing

are open-air or enclosed; and any other advertising placed outdoors.

The manufacturers reported spending \$3.5 million in 2016 on transit advertising — advertising on or in private or public vehicles and ads placed at, on or in any bus stop, taxi stand, transportation waiting area, subway or train station, airport or any other transportation facility. Transit advertising expenditures declined to \$2.3 million in 2017 and then to \$667,000 in 2018. The Commission is not reporting transit advertising expenditures in 2015.

Expenditures on point-of-sale advertising — advertising displayed or distributed at a physical retail location — almost doubled from \$13.4 million in 2015 to \$26.5 million in 2016. These expenditures declined to \$21.5 million in 2017 and then more than doubled to \$45.9 million in 2018.

One of the larger expenditure categories was price discounts paid to e-cigarette product retailers or wholesalers to reduce the price of e-cigarette products to consumers. The manufacturers reported spending \$11.2 million on price discounts in 2015, which made it the seventh largest spending category that year. In 2016, 2017, and 2018, the price discount category was the second largest, third largest, and largest expenditure category, respectively, with expenditures of \$33.7 million in 2016 and 2017 and \$155.1 million in 2018.

Two of the other largest expenditure categories were promotional allowances paid to retailers to facilitate the sale or placement of e-cigarette products and similar promotional allowances paid to wholesalers. Examples of promotional allowances paid to retailers might include payments for stocking, shelving, displaying, and merchandising brands, volume rebates, incentive payments, and the cost of e-cigarette products given to retailers for free for subsequent resale to consumers. Examples of promotional allowances paid to wholesalers might include payments for volume rebates, incentive payments, value-added services, promotional execution, and satisfaction of reporting requirements. In 2015, promotional allowances paid to retailers and wholesalers were \$28.4 million and \$21.1 million, respectively, the largest and fourth largest

expenditure categories, together representing, 25.0% of advertising and promotional expenditures. In 2016, promotional allowances paid to retailers and wholesalers grew to \$36.3 million and \$29.2 million, respectively, the largest and fifth largest expenditure categories, together representing, 24.2% of total expenditures. In 2017, such promotional allowances were \$40.9 million and \$52.3 million, the second largest and largest expenditure categories, together representing, 33.5% of advertising and promotional expenditures. In 2018, promotional allowances paid to retailers and wholesalers grew to \$73.9 million and \$141.4 million, respectively, the second largest and third largest expenditure categories, together representing, 33.4% of total expenditures.

Price discounts and promotional allowances together, represent 30.7% of advertising and promotional expenditures in 2015, 36.6% in 2016, 45.6% in 2017 and 57.5% in 2018.

The reporting manufacturers spent \$22.8 million in 2015 on coupons to reduce the retail cost of e cigarette products, \$20.4 million in 2016, \$27.2 million in 2017, and \$36.5 million in 2018.

The Commission asked the companies about retail value added expenditures — promotions involving free products that are given to consumers at the point of sale, including online, in connection with a purchase of e-cigarette products. Some such promotions involve free e-cigarette products (e.g., buy two, get one free or buy a device and get free e liquid) while others involve other free products (e.g., buy two, get a free t-shirt). The manufacturers reported spending \$60,000 in 2015 on retail-value-added promotions involving free e-cigarette products, \$5.6 million in 2016, \$10.6 million in 2017, and \$11.3 million in 2018. The companies reported zero expenditures in 2017 on retail-value-added promotions involving items other than free e-cigarette products. The Commission is not reporting the expenditures on such promotions in 2015, 2017, or 2018.

The manufacturers reported that they spent \$212,000 in 2018 on branded specialty item distribution — that is, the selling or giving consumers items such as t-shirts, caps, sunglasses, key chains, and sporting goods bearing the brand name of an e-cigarette product. When the distribution of such items is combined with the sale of e-cigarettes, the associated expenditures are reported

under retail value added. The Commission is not reporting 2015, 2016, or 2017 expenditures on branded specialty item distribution. The companies did not report any expenditures for specialty item distribution involving products not bearing an e-cigarette product brand name.

Sampling is the distribution of free e-cigarette products, including the cost of the products themselves and all costs of organizing and conducting the sampling. In 2016, FDA's Deeming Regulation prohibited sampling.²² After the Commission issued its orders to the e-cigarette manufacturers, FTC staff learned that, in lieu of sampling, some companies had been selling or offering e-cigarette products for \$1.00, \$0.99, or some other similar highly discounted price after issuance of the Deeming Regulation. Commission staff asked the companies to report expenditures related to such sales for \$1 or less as sampling. The companies reported sampling expenditures of \$23.0 million in 2015, \$32.4 million in 2016, \$14.2 million in 2017, and \$58.2 million in 2018.

The Commission inquired about expenditures for public entertainment events (e.g., concerts or sporting events) that take place in adult-only facilities and that promote e-cigarette products. The manufacturers reported spending \$3.0 million in 2016 and \$2.3 million in 2018 in connection with such events. The Commission is not reporting the expenditures in 2015 and 2017. The companies did not report any expenditures for public entertainment events promoting e-cigarette products that took place outside of adult-only facilities.²³

The manufacturers reported spending \$1.6 million in 2015 on consumer engagement (not involving the distribution of free e-cigarette products) that took place in adult-only facilities. Such expenditures grew to \$8.5 million in 2016, declined to \$1.7 million in 2017, and rose to \$12.8 million in 2018. The Commission is not reporting expenditures on consumer engagement that took

²² Deeming Tobacco Products To Be Subject to the Federal Food, Drug, and Cosmetic Act, as Amended by the Family Smoking Prevention and Tobacco Control Act; Restrictions on the Sale and Distribution of Tobacco Products and Required Warning Statements for Tobacco Products, 81 Fed. Reg. 28974 (May 10, 2016).

²³ Some expenses related to public entertainment events may have been reported under the sampling category.

place outside of adult-only facilities.

The companies reported that they did not sponsor sports teams or individual athletes.

Finally, the Commission inquired about expenditures related to advertising or promotion through college campus programs including the use of brand ambassadors, campus representatives, or on-campus or off-campus events or promotions. This category is duplicative of expenditures for other categories. The manufacturers reported that they made no expenditures on such college campus programs.

VI. PRODUCT PLACEMENT

The Commission asked the e-cigarette manufacturers whether they or their agents compensated anyone engaged in product placement in motion pictures, television shows, video games, magazines, or other publications between 2015 and 2018. Two of the six companies reported hiring firms to identify product placement opportunities, one from mid-2015 through late 2018 and the other from 2015 through 2017. The other companies said that they did not do so.

The Commission asked the companies whether, between 2015 and 2018, they or their agents solicited the appearance of e-cigarettes in the creative content of any motion picture, television show, video game, magazine, or other publication (“in creative content”) and whether they or their agents paid money or compensation (including free product) in connection with the appearance of any e-cigarette product brand imagery. One company paid to have an e-cigarette integrated into a music video. Another company provided free products to television shows; but it reported that one of its e-cigarette products appeared in only one episode of a premium television show. The other companies said that they did not engage in such activities.

Asked whether they granted approval for the appearance of an e-cigarette product in creative content, one of the companies said that it granted approval for an e-cigarette product to appear in one television episode, but the product did not ultimately appear when the show aired.

VII. AGE VERIFICATION

All of the companies maintained websites for their e-cigarette brands. The Commission inquired about any mechanisms used to deter entry onto those websites by persons under age 18.²⁴ Only one company utilized third-party age verification for part of 2015 to ensure that visitors to one of its product websites were at least 21 years of age. The companies otherwise used self-certification, asking website visitors to confirm that they were either 18 or 21 years of age.

All of the manufacturers reported using third-party age verification to corroborate that the person was at least the minimum legal age prior to selling e-cigarette products online to customers. They mostly collected information including name, date of birth, and address information and matched it to information in databases. The nature and extent of such age verification became more stringent over time. Two companies allowed the submission and matching of the last four digits of the consumer's Social Security number ("SSN digits") when the more general verification failed. A third company, starting in mid-2018, required the submission and matching of the last four SSN digits or the uploading of government-issued identification together with a matching selfie. A fourth company, beginning in 2018, required the submission and matching of the last four SSN digits or the completion of a knowledge-based authentication employing a series of multiple-choice questions referencing current and historical data derived primarily from government sources. Two companies allowed or sometimes allowed the submission of valid government identification as an alternative to the general database match. With respect to the minimum age for online purchase during the relevant time, one company did not indicate whether it age verified 18+ or 21+ for purchase, while the others all age verified 21+. Of those, one company verified 18+ until late 2015, when it changed to 21+, and another switched from 18+ to 21+ in 2018.

²⁴ The minimum legal sales age for e-cigarettes varied by state and over time during the period 2015-2018. In 2019, amendments to the Food, Drug, and Cosmetics Act raised the nationwide minimum legal sales age for tobacco products from 18 years to 21 years. See 21 U.S.C. § 906(d)(5).

All of the companies reported that they followed state laws with respect to obtaining an adult signature upon delivery but none of them appears to have gone above and beyond state law. One company had required an adult signature for all e-cigarette product deliveries until September 2015, but it eliminated that requirement except in states where adult signature was required by state law.

The Commission asked the manufacturers about their mechanisms to prevent underage individuals from joining their mailing lists and loyalty programs. To join their mailing lists, three of the companies relied on the self-certification used to enter the brand website, but otherwise had no specific procedures to deter minors from joining their mailing lists. A fourth company relied until mid-2018 on the self-certification to enter the website, at which point it switched to requiring third-party age verification for enrollment on the mailing list. A fifth company relied on self-certification in 2015 and then required third-party age verification. A sixth company required third-party age verification during the entire period from 2015 to 2018. Only two companies acknowledged having a loyalty program and both said that they employed third-party age verification to join that program.

VIII. SOCIAL MEDIA ACCOUNTS

Five of the six companies have used social media accounts to promote their e-cigarette products. One of the companies said that it never used social media accounts to advertise e-cigarette products. Four companies said they maintained Twitter, Instagram, Facebook, and YouTube accounts to advertise their e-cigarette products, with one saying it ceased doing so in late 2016 and two saying they ceased in late 2018.²⁵ One company used unspecified social media accounts for advertising until sometime in 2015. To the extent that they sought to age restrict access to their social media accounts, the companies reported that they relied upon the tools made available by the platforms, which permit

²⁵ Twitter, Facebook/Instagram, and YouTube do not themselves sell e-cigarette or tobacco advertising.

account holders to designate age restrictions. Before allowing an individual access to a company account, the platforms confirm that an individual meets the designated age -- based either on the age the individual reported when creating a personal account for the platform or on an affirmation that the user was of a certain required legal age in response to a challenge question.

IX. AFFILIATES

Five of the six manufacturers said that, at times between 2015 and 2018, they used affiliate programs to market their e-cigarette products. One company had a limited and brief affiliate program in late 2018, paying two “deal sites” to publish promo codes to be used on its website. A second company, which had an affiliate program from 2016 through mid-2018, primarily partnered with deal websites such as Groupon or Slick Deals but also used vaping blog affiliates. A third company operated an affiliate program for three months in mid-2018; and a fourth operated an affiliate program through January 2017. A fifth company had an affiliate program, primarily consisting of vaping discussion communities, enthusiasts, and product review websites, through October 2018.

X. CELEBRITIES, INFLUENCERS, AND ENDORSERS

The FTC asked the companies whether between 2015 and 2018, they engaged in marketing using celebrities, social media influencers, brand ambassadors, or other endorsers (collectively “influencers”). Two companies said that they did not use influencers; one said that it only engaged in a pilot program involving a handful of influencer blogs (starting in late 2016 and lasting approximately three months); and one company engaged influencers in 2018 to publish online product reviews and make posts or stories on Instagram or Facebook. Two companies utilized influencers throughout the period. One of those companies used celebrities and social media influencers to market its products on their social media pages and appear in television ads and at product events and provided products and, in some instances, monetary compensation, to industry product reviewers for reviews on blogs and on YouTube. The other company, among other things, sent free products or discount codes to celebrities

and other high-profile individuals who were smokers or vapers, hired several influencers to write blog posts, make social media posts, and/or appear in sponsored ads, and compensated individuals who appeared in company-produced testimonials.

One company said that it reviewed all paid influencer social media posts before and after they were posted. A second company said it reviewed all paid social media posts by its influencers before they were posted. A third company said its legal department was involved in reviewing and overseeing certain influencer messaging and content. A fourth company said that to the extent that it just provided influencers with free or discounted products, it did not monitor their social media accounts.

Table 1
Total Product Sales and Percentages of Total Sales

	2015		2016		2017		2018	
Total sales	\$304,170,139		\$487,791,646		\$782,269,969		\$2,045,622,966	
Cartridge systems	\$259,984,551	85.47%	\$417,302,598	85.55%	\$707,415,500	90.43%	\$1,969,019,051	96.26%
Disposables	\$44,185,495	14.53%	\$68,404,886	14.02%	\$72,420,899	9.26%	\$74,683,954	3.65%
Open systems	\$92	0.00%	\$2,084,163	0.43%	\$2,427,812	0.31%	\$1,535,492	0.08%
Indirect sales	\$268,574,337	88.30%	\$436,160,722	89.42%	\$690,224,679	88.23%	\$1,883,091,677	92.05%
Direct sales	\$35,480,901	11.66%	\$50,047,078	10.26%	\$90,605,887	11.58%	\$131,274,855	6.42%
Sales for \$1 or less	\$114,901	0.04%	\$1,583,847	0.32%	\$1,439,403	0.18%	\$31,256,434	1.53%

Table 2
Cartridge System Sales and Giveaways and Percentages of Total Sales

	2015		2016		2017		2018	
Cartridge system sales	\$259,984,551		\$417,302,598		\$707,415,500		\$1,969,019,051	
Cartridge sales	\$197,187,253	75.85%	\$338,234,357	81.05%	\$567,174,474	80.18%	\$1,560,395,293	79.25%
Device sales	\$649,055	0.25%	\$3,810,583	0.91%	\$23,614,906	3.34%	\$168,305,746	8.55%
Cartridge & device bundle sales	\$62,148,238	23.90%	\$75,257,657	18.03%	\$116,626,415	16.49%	\$240,318,013	12.20%
Indirect sales	\$225,163,505	86.61%	\$367,124,417	87.98%	\$622,341,019	87.97%	\$1,816,012,985	92.23%
Direct sales	\$34,706,146	13.35%	\$48,594,334	11.64%	\$83,635,077	11.82%	\$121,830,755	6.19%
\$1 sales	\$114,901	0.04%	\$1,583,847	0.38%	\$1,439,403	0.20%	\$31,175,312	1.58%
Total cartridges sold & given away	169,281,616		211,062,325		313,626,942		831,349,329	
Cartridges sold indirectly	152,178,291	88.99%	190,647,050	90.33%	286,283,022	91.28%	790,440,407	95.08%
Cartridges sold directly	12,225,256	7.22%	15,839,150	7.50%	22,703,264	7.24%	33,502,457	4.03%
Cartridges sold for \$1 or less	272,420	0.16%	2,878,860	1.36%	2,766,371	0.88%	4,338,265	0.52%
Cartridges given away	4,605,649	2.72%	1,697,265	0.80%	1,874,285	0.60%	3,068,201	0.37%
Total devices sold & given away	7,814,159		8,849,196		11,824,626		30,466,903	
Devices sold indirectly	6,953,901	88.99%	7,866,147	88.89%	11,004,545	93.06%	26,993,075	88.60%
Devices sold directly	100,612	1.29%	173,633	1.96%	442,840	3.75%	850,367	2.79%
Devices sold for \$1 or less	28,278	0.36%	328,816	3.72%	177,280	1.50%	2,310,951	7.59%
Devices given away	731,368	9.36%	480,600	5.43%	199,961	1.69%	312,510	1.03%

Table 3
Disposable Sales and Giveaways and Percentages of Total Sales

	2015		2016		2017		2018	
Disposable sales	\$44,185,495		\$68,404,886		\$72,420,899		\$74,683,954	
Indirect sales	\$43,410,770	98.25%	\$67,178,662	98.21%	\$66,396,135	91.68%	\$66,058,562	88.45%
Direct sales	\$774,726	1.75%	\$1,226,224	1.79%	\$6,024,764	8.32%	\$8,544,270	11.44%
Sales for \$1 or less	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$81,123	0.11%
Total sold & given away	7,802,219		12,879,262		15,838,443		17,226,341	
Indirect sales	7,727,777	99.05%	12,635,814	98.11%	14,609,115	92.24%	15,402,865	89.41%
Direct sales	58,144	0.75%	157,888	1.23%	1,221,223	7.24%	1,706,549	9.91%
Sales for \$1 or less	0	0.00%	0	0.00%	0	0.00%	22,752	0.13%
Given away	16,298	0.21%	85,560	0.66%	8,105	0.05%	94,175	0.55%

Table 4
Open System Sales and Giveaways and Percentages of Total Sales

	2015		2016		2017		2018	
Open system sales	\$92		\$2,084,163		\$2,427,812		\$1,535,492	
E-liquid sales	\$57	65.52%	\$815,107	39.14%	\$1,347,033	55.46%	\$1,147,756	74.75%
Device sales	\$0	0.00%	\$1,182,794	56.80%	\$951,038	39.16%	\$314,167	20.46%
E-liquid & device bundle sales	\$30	34.48%	\$84,427	4.05%	\$130,800	5.39%	\$73,586	4.79%
Indirect sales	\$62	67.39%	\$1,857,643	89.13%	\$1,487,524	61.27%	\$1,020,130	66.44%
Direct sales	\$30	32.61%	\$226,519	10.87%	\$940,288	38.73%	\$515,362	33.56%
Sales for \$1 or less	\$0	0.00%	\$0	0.00%	\$0	0.00%	\$0	0.00%
Total e-liquids sold & given away	1,135		200,543		261,665		193,862	
E-liquids indirect sales	1,134	99.91%	157,439	78.51%	171,184	65.37%	121,526	62.69%
E-liquids direct sales	1	0.09%	43,091	21.49%	89,526	34.27%	54,632	28.18%
E-liquids sold for \$1 or less	0	0.00%	0	0.00%	0	0.00%	0	0.00%
E-liquids given away	0	0.00%	13	0.01%	955	0.36%	17,704	9.13%
Total devices sold & given away	1		197,368		112,573		40,664	
Devices indirect sales	0	0.00%	177,778	90.07%	82,128	72.96%	23,980	58.97%
Devices direct sales	1	100.00%	19,589	9.93%	30,292	26.91%	16,682	41.02%
Devices sold for \$1 or less	0	0.00%	0	0.00%	0	0.00%	0	0.00%
Devices given away	0	0.00%	1	0.00%	153	0.14%	2	0.00%

Table 5
Percentages of Cartridges, Disposables, and E-Liquid Containers with Various Flavors

	2015	2016	2017	2018
Cartridge flavors				
Tobacco	47.24%	39.80%	34.26%	20.96%
Menthol	39.00%	38.04%	36.26%	36.90%
All other	13.76%	22.16%	29.47%	42.14%
-Alcohol	0.11%	0.14%	0.04%	0.03%
-Beverage	3.56%	4.07%	5.37%	3.47%
-Candy/Dessert	4.47%	7.26%	6.67%	4.38%
-Fruit	4.72%	8.95%	15.27%	29.70%
-Fruit &Menthol	0.00%	0.02%	0.19%	0.09%
-Spice	0.90%	1.72%	1.04%	0.50%
-Other	0.00%	0.00%	0.88%	3.96%
Disposable flavors				
Tobacco	52.05%	45.64%	38.52%	35.44%
Menthol	25.95%	22.42%	25.72%	27.16%
All other	22.00%	31.94%	35.76%	37.40%
-Candy/Dessert	0.00%	0.00%	0.07%	0.12%
-Fruit	22.00%	26.81%	31.96%	33.16%
-Spice	0.00%	0.00%	3.73%	4.12%
E-liquid bottle flavors				
Tobacco	12.78%	35.07%	32.97%	27.94%
Menthol	14.45%	30.15%	36.12%	28.04%
All other	72.78%	34.78%	30.91%	44.02%
-Alcohol	8.46%	0.18%	0.26%	0.12%
-Beverage	0.00%	0.69%	1.62%	15.27%
-Candy/Dessert	30.66%	1.97%	4.68%	2.32%
-Fruit	27.31%	28.52%	18.10%	21.47%
-Fruit & Menthol	0.00%	2.09%	3.20%	1.10%
-Spice	3.17%	1.31%	3.06%	3.74%
-Other	3.17%	0.03%	0.00%	0.00%

Table 6
Percentages of Cartridges, Disposables, and E-Liquid Containers
Within Various Nicotine Concentration Ranges and Their Average Nicotine Concentrations
Measured in Milligrams of Nicotine per Milliliter of E-liquid

	2015	2016	2017	2018
Cartridges - nicotine concentration				
0	0.21%	0.18%	0.03%	0.02%
1-10.99	0.58%	0.46%	0.01%	0.01%
11-20.99	11.42%	6.75%	8.21%	13.07%
21-30.99	15.52%	16.05%	10.67%	5.65%
31-40.99	0.82%	10.72%	20.62%	9.21%
41-50.99	0.00%	0.18%	1.33%	0.91%
51-60.99	71.44%	65.66%	59.13%	71.13%
Average	47.46	47.23	46.79	49.41
Disposables - nicotine concentration				
0	-0.06%	0.13%	0.00%	0.00%
11-20.99	28.72%	7.17%	1.93%	0.00%
21-30.99	71.34%	92.57%	68.91%	55.07%
31-40.99	0.00%	0.00%	1.20%	2.35%
41-50.99	0.00%	0.01%	7.16%	4.37%
51-60.99	0.00%	0.11%	18.49%	28.25%
61-70.99	0.00%	0.00%	2.31%	9.95%
Average	25.04	27.06	34.53	39.53
E-liquid Bottle - nicotine concentration				
0	0.00%	1.06%	1.06%	1.62%
1-10.99	27.22%	89.37%	53.36%	35.19%
11-20.99	13.13%	2.83%	32.60%	11.49%
21-30.99	0.00%	6.30%	12.98%	30.77%
31-40.99	29.60%	0.23%	0.00%	0.00%
41-50.99	0.00%	0.00%	0.00%	20.94%
51-60.99	30.04%	0.22%	0.00%	0.00%
Average	32.35	7.75	11.84	21.83

**Table 7
 Bundling of Cartridge System Components**

	2015	2016	2017	2018
% Devices bundled with cartridges	97.10%	95.40%	88.12%	63.03%
% Devices not bundled with cartridges	2.90%	4.60%	11.88%	36.97%
% Cartridges bundled with devices	4.88%	4.13%	3.33%	2.31%
% Cartridges not bundled with devices	95.12%	95.87%	96.67%	97.69%
# of devices bundled together				
1 device	100.01%	100.00%	99.98%	100.00%
2 or more devices	-0.01%	0.00%	0.02%	0.00%
# of cartridges bundled together				
1 cartridge	4.50%	4.30%	5.05%	4.88%
2 cartridge	71.77%	69.16%	58.42%	26.06%
3 cartridges	3.58%	14.83%	11.41%	11.64%
4 cartridges	1.31%	4.27%	22.05%	56.33%
5 cartridges	18.84%	7.44%	0.09%	0.02%
6 or more cartridges	0.00%	0.00%	2.98%	1.06%

Table 8
Percentages of Disposables Sold or Given Away Individually or in Bundles

	2015	2016	2017	2018
1	100.00%	100.00%	92.29%	96.30%
5	0.00%	0.00%	2.70%	3.70%
20	0.00%	0.00%	2.06%	0.00%
100	0.00%	0.00%	2.95%	0.00%

Table 9
Advertising and Promotional Expenditures

	2015	2016	2017	2018
TV advertising	\$18,765,588	\$13,706,190	\$5,994,063	\$7,590,297
Movie advertising	\$0	\$0	\$0	\$0
Radio advertising	\$1,949,099	\$1,519,965	\$1,308,292	\$4,505,002
Other audio-visual advertising	\$0	\$0	N/A	N/A
Product placement	N/A	\$113,012	N/A	N/A
Company Internet sites	\$5,171,616	\$7,888,889	\$8,888,138	\$11,616,875
Social media	N/A	N/A	\$779,291	\$577,285
Other Internet and digital advertising	\$6,389,902	\$8,908,004	\$12,392,570	\$22,315,874
Endorsements	\$287,950	\$104,381	\$4,431,029	\$4,287,431
Direct mail marketing	N/A	N/A	\$1,249,778	\$4,325,312
Email marketing	\$66,648	\$225,703	\$152,984	\$430,359
Newspaper advertising	\$0	\$0	\$0	N/A
Magazine advertising	\$2,451,090	\$7,072,483	\$4,884,538	\$5,240,440
Outdoor advertising	\$969,603	\$2,815,302	\$2,854,201	\$1,028,472
Transit advertising	N/A	\$3,453,245	\$2,319,535	\$666,682
Point-of-sale advertising	\$13,365,702	\$26,462,177	\$21,445,036	\$45,872,667
Price discounts	\$11,184,584	\$33,709,537	\$33,648,290	\$155,124,847
Promotional allowances paid to retailers	\$28,430,304	\$36,305,608	\$40,944,305	\$73,852,950
Promotional allowances paid to wholesalers	\$21,072,195	\$29,273,783	\$52,326,119	\$141,375,232
Coupons for reduction of purchase price	\$22,788,155	\$20,395,598	\$27,154,852	\$36,461,104
Retail-value-added - free e-cigarette	\$60,115	\$5,616,750	\$10,586,295	\$11,311,627
Retail-value-added - free items other than e-cigarette Products	N/A	N/A	\$0	N/A
Specialty item distribution - branded	N/A	N/A	N/A	\$211,770
Specialty item distribution - not branded	\$0	\$0	\$0	\$0
Sampling	\$22,962,323	\$32,439,417	\$14,153,277	\$58,164,616
Public entertainment - adult-only facilities	N/A	\$3,024,758	N/A	\$2,303,716
Public entertainment - not adult-only facilities	\$0	\$0	\$0	\$0
Consumer engagement - adult-only facilities	\$1,613,769	\$8,537,860	\$1,701,784	\$12,771,648
Consumer engagement - not adult-only facilities	N/A	N/A	N/A	N/A
Sponsorship	\$0	\$0	\$0	\$0
All other	\$40,280,324	\$29,401,798	\$31,341,033	\$43,587,550
Total reportable expenditures	\$197,808,967	\$270,974,462	\$278,555,410	\$643,621,755
Campus promotion	\$0	\$0	\$0	\$0

APPENDIX

Advertising and Promotional Expenditure Categories

TV Advertising: Advertising on broadcast, cable, and satellite television channels, Internet television (e.g., Hulu, Netflix, Amazon Prime), and webisodes (e.g., web shows on YouTube), including spot ads, long-form commercials, and sponsored programming; but excluding, to the extent practicable, expenditures in connection with Product Placement, Social Media, Endorsements, or Public Entertainment (Adult-Only and Not Adult-Only).

Movie Advertising: Advertising spots before or during movies, including in movie theaters, on DVDs, and streamed movies (e.g., a movie streamed on Hulu); but excluding, to the extent practicable, expenditures in connection with TV Advertising, Product Placement, or Endorsements.

Radio Advertising: Advertising on broadcast, satellite, Internet radio, audio streaming services (e.g., Pandora and Spotify), and podcasts, including spot ads, long-form commercials, and sponsored programming; but excluding, to the extent practicable, expenditures in connection with Product Placement, Social Media, or Endorsements.

Other Audio-Visual Advertising: Audio, audio-visual, and video advertising not covered by TV Advertising, Movie Advertising, Radio Advertising, Product Placement, Social Media, Endorsements, or Transit Advertising, including advertising on screens or monitors in commercial establishments, such as video arcades or retail shops, and video games.

Product Placement: All expenditures for product placement in the creative content of any program or performance (e.g., movies, television shows, Internet series, video games, and other broadcast and digital media).

Company Internet Sites: All expenditures for any Company-owned or -operated Internet site, or any site operated on its behalf, that contains information about the Company's e-cigarette products, and that is directed to persons located in the United States; but excluding, to the extent practicable, expenditures in connection with Email Marketing, Coupons for Reduction of Purchase Price, Public Entertainment – Not Adult-Only Facilities, or Sponsorship.

Social Media: Advertising on any Company-controlled social media account or channel (e.g., Facebook, Twitter, Instagram, Snapchat, Reddit, YouTube) that is directed to persons located in the United States, including Company-authored posts and replies, and re-posts of other users' content on Company-controlled accounts or channels; but excluding expenses related to celebrities, social media influencers, brand ambassadors, or other endorsers endorsing e-cigarette products, which should be reported as Endorsements.

Other Internet and Digital Advertising: All expenditures for Internet or digital advertising directed to persons located in the United States that are not covered by TV Advertising, Movie Advertising, Radio Advertising, Other Audio-Visual Advertising, Product Placement, Social Media, Endorsements, or Email Marketing, including banner, display, pop-up, and native advertising on third-party Internet sites, search advertising, sponsored digital content, advertising using a short message service (SMS text), multimedia (MMS) messaging, instant messaging (IM), and direct messaging (DM), and advertising viewed in apps or video games; but excluding, to the

extent practicable, expenditures in connection with Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship.

Endorsements: All expenditures to procure the mention or use of e-cigarette products by a celebrity, social media influencer, brand ambassador, or other endorser, in any situation; but excluding expenditures related to an actor mentioning or using an e-cigarette product when assuming the role of a character, which should be reported as Product Placements.

Direct Mail Marketing: Direct mail marketing; but excluding, to the extent practicable, expenditures in connection with Endorsements, Email Marketing, Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship.

Newspaper Advertising: Newspaper advertising, including print advertising and native advertising; but excluding, to the extent practicable, expenditures in connection with Endorsements, Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship. To the extent that advertising appearing in print editions of newspapers also appears in nearly identical digital editions of the newspapers, such expenditures should be reported here, but other advertising on a newspaper website should be reported in Other Internet and Digital Advertising.

Magazine Advertising: Magazine advertising, including print advertising and native advertising; but excluding, to the extent practicable, expenditures in connection with Endorsements, Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship. To the extent that advertising appearing in print editions of magazines also appears in nearly identical digital editions of the magazines, such expenditures should be reported here, but other advertising on a magazine website should be reported in Other Internet and Digital Advertising.

Outdoor Advertising: Billboards; signs and placards in arenas, stadiums, and shopping malls, whether any of the foregoing are open-air or enclosed; and any other advertising placed outdoors, regardless of their size; but excluding, to the extent practicable, expenditures in connection with Endorsements, Transit Advertising, Point-of-Sale Advertising, Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship. Expenditures for advertising placed inside physical retail locations, whether facing inward or outward, which should be reported in Point-of-Sale Advertising.

Transit Advertising: Advertising on or within private or public vehicles and all advertisements placed at, on or within any bus stop, taxi stand, transportation waiting area, subway or train station,

airport or any other transportation facility; but excluding, to the extent practicable, expenditures in connection with Endorsements, Outdoor Advertising, Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship.

Point-of-Sale Advertising: Advertising materials displayed or distributed at a physical retail location; but excluding, to the extent practicable, expenditures in connection with in store video advertising (which should be reported as Other Audio-Visual Advertising), Coupons, Retail-Value-Added (Free E-Cigarette Products and Other Free Items), Specialty Item Distribution (Branded and Not Branded), Sampling, Public Entertainment (Adult-Only and Not Adult-Only), Consumer Engagement (Adult-Only and Not Adult-Only), or Sponsorship.

Price Discounts: Expenditures paid to e-cigarette product retailers or wholesalers to reduce the price of e-cigarette products to consumers, including off invoice discounts, buy downs, voluntary price reductions, and trade programs; but excluding, to the extent practicable, expenditures in connection with Coupons or Retail-Value-Added – Free E-Cigarette Products.

Promotional Allowances Paid to Retailers: All expenditures for promotional allowances paid to E-Cigarette Product retailers to facilitate the sale or placement of any E-Cigarette Product, including, but not limited to, payments for stocking, shelving, displaying, and merchandising brands, volume rebates, incentive payments, and the cost of E-Cigarette Products given to retailers for free for subsequent resale to consumers; but excluding, to the extent practicable, expenditures in connection with Other Audio-Visual Advertising, Other Internet and Digital Advertising, Direct Mail Marketing, Newspaper Advertising, Magazine Advertising, Outdoor Advertising, Point-of-Sale Advertising, and Price Discounts.

Promotional Allowances Paid to Wholesalers: All expenditures for promotional allowances paid to E-Cigarette Product wholesalers to facilitate the sale or placement of any E-Cigarette Product, including, but not limited to, payments for volume rebates, incentive payments, value-added services, promotional execution, and satisfaction of reporting requirements; but excluding, to the extent practicable, expenditures in connection with Other Audio-Visual Advertising, Other Internet and Digital Advertising, Direct Mail Marketing, Newspaper Advertising, Magazine Advertising, Outdoor Advertising, Point-of-Sale Advertising, and Price Discounts.

Coupons for Reduction of Purchase Price: All expenditures associated with coupons used to reduce the retail cost of e-cigarette products (whether distributed in person, by mail, online, or otherwise and whether redeemed at the point of sale, by mail, online, or otherwise), including all redemption expenses and costs associated with promoting, designing, printing, and distributing the coupons. Coupons for free e-cigarette products, with no purchase or payment required to obtain the coupons or e-cigarette products as Sampling.

Retail-value-added – Free E-Cigarette Products: All expenditures associated with promotions involving free e-cigarette products that are given to consumers at the point of sale, including online, in connection with a purchase of e-cigarette products (e.g., buy two, get one free or buy a device and get free e-liquid), whether or not the free products are physically bundled together with the purchased products. For e-cigarette products bundled together to be reported in this category,

one or more of the products in the bundle must be promoted as free.

Retail-value-added – Free Items Other Than E-Cigarette Products: All expenditures associated with promotions involving free items other than e-cigarette products that are given to consumers at the point of sale, including online, in connection with a purchase of e-cigarette products (e.g., buy two, get a free t-shirt), whether or not the free products are physically bundled together with the purchased products. For product bundles to be reported in this category, the products in the bundle that are not e-cigarette products must be promoted as free.

Specialty Item Distribution – Branded: All costs of distributing any items (other than e-cigarette products, written or electronic publications, and items whose sole function is to advertise or promote e-cigarette products) that bear the name, logo, or an image of any portion of the package of any e-cigarette product, when the items are not given to consumers at the point of sale (e.g., a branded umbrella redeemed with loyalty program points). The expenditures reported are the net cost to the Company, i.e., payments received from consumers for such items should be deducted.

Specialty Item Distribution – Not Branded: All costs of distributing any items (other than e-cigarette products, written or electronic publications, and items whose sole function is to advertise or promote e-cigarette products) that do not bear the name, logo, or an image of any portion of the package of any e-cigarette product, when the items are not given to consumers at the point of sale (e.g., a gift card to an online music retailer redeemed with loyalty program points). The expenditures reported are the net cost to the Company, i.e., payments received from consumers for such items should be deducted.

Sampling: All costs of sampling of e-cigarette products, including the costs of the products themselves and all costs of organizing, promoting, and conducting the sampling. Sampling includes the distribution of e-cigarette products for consumer testing or evaluation when consumers are able to use the products outside of a facility owned or operated by the Company or its agents, but not the cost of actual clinical testing or market research associated with such distributions. Coupons distributed for free e-cigarette products, with no purchase or payment required to obtain the coupons or products, should be reported in this category.

Public entertainment – Adult-Only Facilities: All expenditures for public entertainment events (including, but not limited to, concerts and sporting events) referring or relating to e-cigarette products that take place in an Adult-Only Facility, includes expenditures promoting or sponsoring such events. Whenever such activities are combined with the consumer engagement in adult-only facilities, the expenditures connected with consumer engagement should be reported solely in Consumer Engagement – Adult-Only Facilities.

Public Entertainment – Not Adult-Only Facilities: All expenditures for public entertainment events (including, but not limited to, concerts and sporting events) referring or relating to e-cigarette products, at facilities that are open to persons under the age of 18, including expenditures promoting or sponsoring such events. Whenever such activities are combined with the consumer engagement in facilities open to persons under the age of 18, the expenditures connected with consumer engagement should be reported solely in Consumer Engagement – Not Adult-Only Facilities.

Consumer Engagement – Adult-Only Facilities: All expenditures for consumer engagement in adult-only facilities, when such activities do not involve the distribution of free e-cigarette products or coupons for free e-cigarette products with no purchase or payment required to obtain the coupons or products, including any third-party agency fees, and excluding the cost of any coupons distributed.

Consumer Engagement – Not Adult-Only Facilities: All expenditures for consumer engagement at facilities open to persons under the age of 18, when such activities do not involve the distribution of free e-cigarette products or coupons for free e-cigarette products with no purchase or payment required to obtain the coupons or products, including any third-party fees, and excluding the cost of any coupons distributed in the course of consumer engagement activities.

Sponsorship: All expenditures for sponsorship of sports teams or individual athletes; but excluding, to the extent practicable, expenditures in connection with Endorsements. This category excludes expenditures promoting or sponsoring sporting events, which should be reported as Public Entertainment (Adult-Only or Not Adult-Only).

All Other: All expenditures for any advertising or promotional expenditures not covered by another reporting category.

Campus Promotion: All expenditures related to advertising or promotion through college campus programs, including but not limited to, compensation to campus representatives or brand ambassadors, expenditures for organizing, promoting, or conducting any campus events or promotions, whether on campus or off campus, and all expenditures for implementing such programs or events. This category is duplicative of expenditures for other categories.