

# **Appendix C**

## **Development of an Emissions Inventory and Automotive Endpoint Fraction of Energized Electrical Cleaner Sales**

### **Proposed Amendments to the California Consumer Products Regulations**

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## Appendix C: Development of an Emissions Inventory and Automotive Endpoint Fraction of Energized Electrical Cleaner Sales

This Appendix describes how staff developed toxic air contaminant (TAC) emission inventories for “Energized Electrical Cleaner” (EEC) products using sales and chemical speciation data CARB collected in response to the Consumer and Commercial Products Survey CARB conducted for the years 2013 to 2015 (Consumer Products Survey), and in response to the perchloroethylene and methylene chloride reporting requirement in section 94513(e)(1)(B) of the Consumer Products Regulations. Additionally, this Appendix illustrates staff’s methodology to develop emissions factors that enable comparison of actual and anticipated TAC emissions from the category, as reflected in the 2012 Base Year Inventory.

### 1. TAC Emissions Data Sources

A summary of TAC emissions from EEC products reported in response to the 2013-2015 Survey and the perchloroethylene and methylene chloride reporting requirement in section 94513(e)(1)(B) is shown in Table C-1.

**Table C-1  
Reported Energized Electrical Cleaner TAC Emissions (tons per year)**

Year	Reporting Products	Reporting Companies	Perchloroethylene	Methylene Chloride	Trichloroethylene
2006*	22	9	61.85	0.62	15.83****
2007*	39	10	67.81	1.42	17.36****
2008*	42	12	69.83	2.00	17.87****
2009*	32	11	74.22	0.40	19.00****
2010*	22	6	69.60	0.00	17.82****
2011**					
2012**					
2013***	41	12	77.97	0.00	20.21
2014***	39	12	79.30	0.00	20.04
2015***	35	11	78.75	0.00	30.48

\* Reported as required under section 94513(e)(1)(B).

\*\* No reported data was available for 2011 or 2012

\*\*\* Reported in the 2013-2015 Consumer and Commercial Products Survey (CARB, 2015)

\*\*\*\* 2006-2010 trichloroethylene emissions derived using factor. 2013-2015 emissions as reported.

Since trichloroethylene content was not subject to the reporting requirements under section 94513(e), a trichloroethylene factor was determined using the average ratio between trichloroethylene and perchloroethylene mass in “Energized Electrical Cleaner” reported in the 2013-2015 Survey, which showed that trichloroethylene emissions were an average of 25.6 percent of the perchloroethylene emissions in the years 2013 to 2015. This trichloroethylene factor was then applied to the reported perchloroethylene mass (reported in response to the 2013-2015 Survey and section 94513(e)(1)(B) reporting requirement) to estimate the trichloroethylene emissions for that year.

## 2. TAC-TOG Emissions Factor

As illustrated in Table C-2, speciation of the mass of reported EEC products in response to the 2013-2015 Survey shows that the category is nearly 100 percent total organic gases (TOG), consisting mainly of trichloroethylene, perchloroethylene, and propellant.

**Table C-2  
TOG Speciation of Energized Electrical Cleaner Products**

TOG Ingredient	Percentage of Category
Perchloroethylene	63.8%
Trichloroethylene	26.6%
Propellant	4.2%
Other TOG	5.4%

90.4 percent of the TOG contents reported in response to the 2013-2015 Survey were TAC species. This 90.4 percent TAC content factor, when applied to the 2012 base year TOG inventory (CEPAM, 2020), as shown in Table C-3, provides an estimate of expected TAC emissions from EECs after the category was adopted in 2005. (CARB, 2004b)

**Table C-3  
2012 Base Year Estimated TOG and Expected TAC Emissions from Energized Electrical Cleaners (tons per year)**

Year	2012 Base Year TOG Emissions	2012 Base Year Expected TAC Emissions <sup>1</sup>
2006	63.55	57.45
2007	64.35	58.17
2008	65.23	58.96
2009	65.96	59.62
2010	66.61	60.22
2011	67.09	60.65
2012	67.63	61.14
2013	68.18	61.64
2014	68.73	62.13
2015	69.42	62.76
2016	70.01	63.29
2017	70.63	63.85
2018	71.18	64.34
2019	71.80	64.90
2020	72.45	65.50
2021	73.15	66.12
2022	73.95	66.85
2023	74.53	67.38

1 - 90.4% TAC-TOG Speciation Profile Applied.

### 3. Market Endpoint Data

Staff performed a review of EEC market endpoint data for a major manufacturer of EEC products, which included a review of the destination of over 460 bulk transactions of EEC products, and staff was able to classify each of these endpoints by the specific type of consumer served and by the particular destination for the products. Broadly defined, these included:

- Electrical Wholesalers, who primarily supply products to electrical contractors on a wholesale basis;
- Industrial Wholesalers, who supply a wide range of industrial consumers, including factories, warehouse, and industrial maintenance contractors;
- Home Improvement Retailers, including big box home improvement retailers that provide a wide variety of products to the average consumer;
- Automotive Parts and Accessories Stores, who provide automotive parts and maintenance supplies to both the average retail consumer and commercial automotive repair facilities; and
- Automotive Commercial Direct suppliers, who directly supply automotive repair facilities with parts and maintenance supplies.

As shown in Table C-4, the data indicated that 57 percent of EEC products have automotive endpoints, which is considered to be outside the intended use scenario for the EEC category (CARB, 2004a). This 57 percent value provides an independent factor to understand the discrepancy between expected and reported TAC emissions from the category.

**Table C-4  
Energized Electrical Cleaner Product Market Endpoints**

<b>Market Endpoint</b>	<b>Market Share</b>
Automotive Parts and Accessories Stores	50%
Automotive Commercial Direct	7%
Electrical Wholesale	5%
Home Improvement Retail	10%
Industrial Wholesale	28%

#### 4. Expected and Actual TAC Emissions from The Energized Electrical Cleaner Category

As shown in Table C-5 and Figure C-1, by 2023, staff project over 59 tons per year in excess TAC emissions from EEC products than was anticipated in 2005 when TACs were allowed in the category. Applying market endpoint data, these excess TAC emissions can be explained by the unintended automotive use of the product, which also unnecessarily increases the public exposure to, and the resulting health risks from these TACs.

**Table C-5  
Energized Electrical Cleaner: Expected, Actual, and Excess TAC Emissions (tons per year)**

Year	2012 Base Year Expected TAC Emissions*	Reported TAC Emissions**	Excess TAC Emissions***	Emissions Due to Automotive Market Endpoint Sales****
2006	57.45	86.13	28.68	49.09
2007	58.17	95.24	37.07	54.29
2008	58.96	98.67	39.71	56.24
2009	59.62	102.98	43.36	58.70
2010	60.22	96.16	35.94	54.81
2011	60.65			
2012	61.14			
2013	61.64	108.00	46.36	61.56
2014	62.13	109.28	47.15	62.29
2015	62.76	120.16	57.40	68.49
2016	63.29	121.06	57.77	69.00
2017	63.85	121.98	58.13	69.53
2018	64.34	122.85	58.51	70.02
2019	64.90	123.59	58.69	70.45
2020	65.50	124.40	58.90	70.91
2021	66.12	125.23	59.10	71.38
2022	66.85	126.07	59.22	71.86
2023	67.38	126.95	59.57	72.36

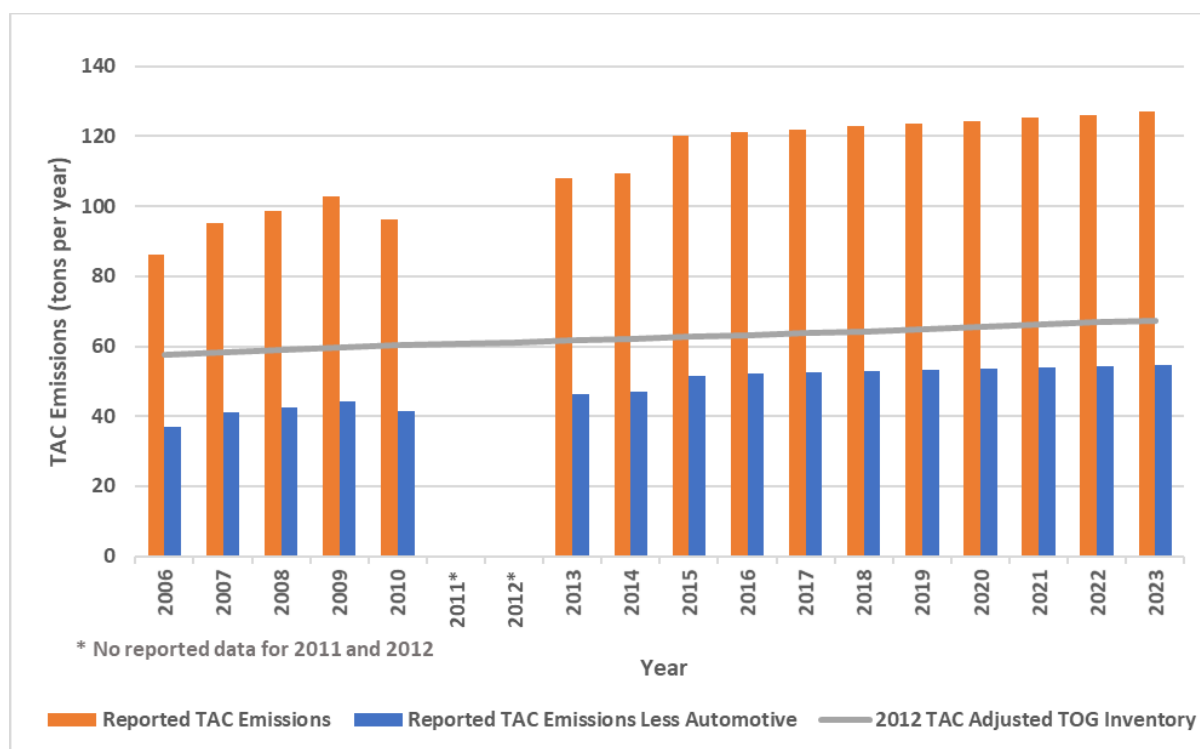
\* 2012 Base Year Expected TAC Emissions (90.4% TAC-TOG Speciation Profile Applied)

\*\* 2006-2010 emissions include trichloroethylene emissions derived using factor. 2013-2015 emissions as reported. 2006-2010,2013-2015 10% market adjustment applied. 2016-2023 growth factor applied.

\*\*\* Excess TAC emissions = Reported TAC Emissions – 2012 Base Year Expected Emissions

\*\*\*\* Emissions Due To Automotive Market Endpoint Sales = Reported TAC Emissions \* 57% automotive endpoint factor

**Figure C-1  
Expected, Actual, and Projected TAC Emissions from Energized Electrical Cleaners**



**Reference**

California Air Resources Board " Initial Statement of Reasons for the Proposed Amendments to the California Aerosol Coating Products, Antiperspirants and Deodorants, and Consumer Products Regulations, Test Method 310, and Airborne Toxic Control Measure for para-Dichlorobenzene Solid Air Fresheners and Toilet/Urinal Care Products" Chapter 6: Description of Product Categories. May 7, 2004 (CARB, 2004a)