

Announcements and Deadlines



- Please ask questions in the [Q&A](#) box at any time
- Moderators will respond to logistical questions during the webinar
- Presentation content related questions will be answered at the end



- Product Formulator contacts were due **January 14th**
- Completed surveys are due **April 8th**



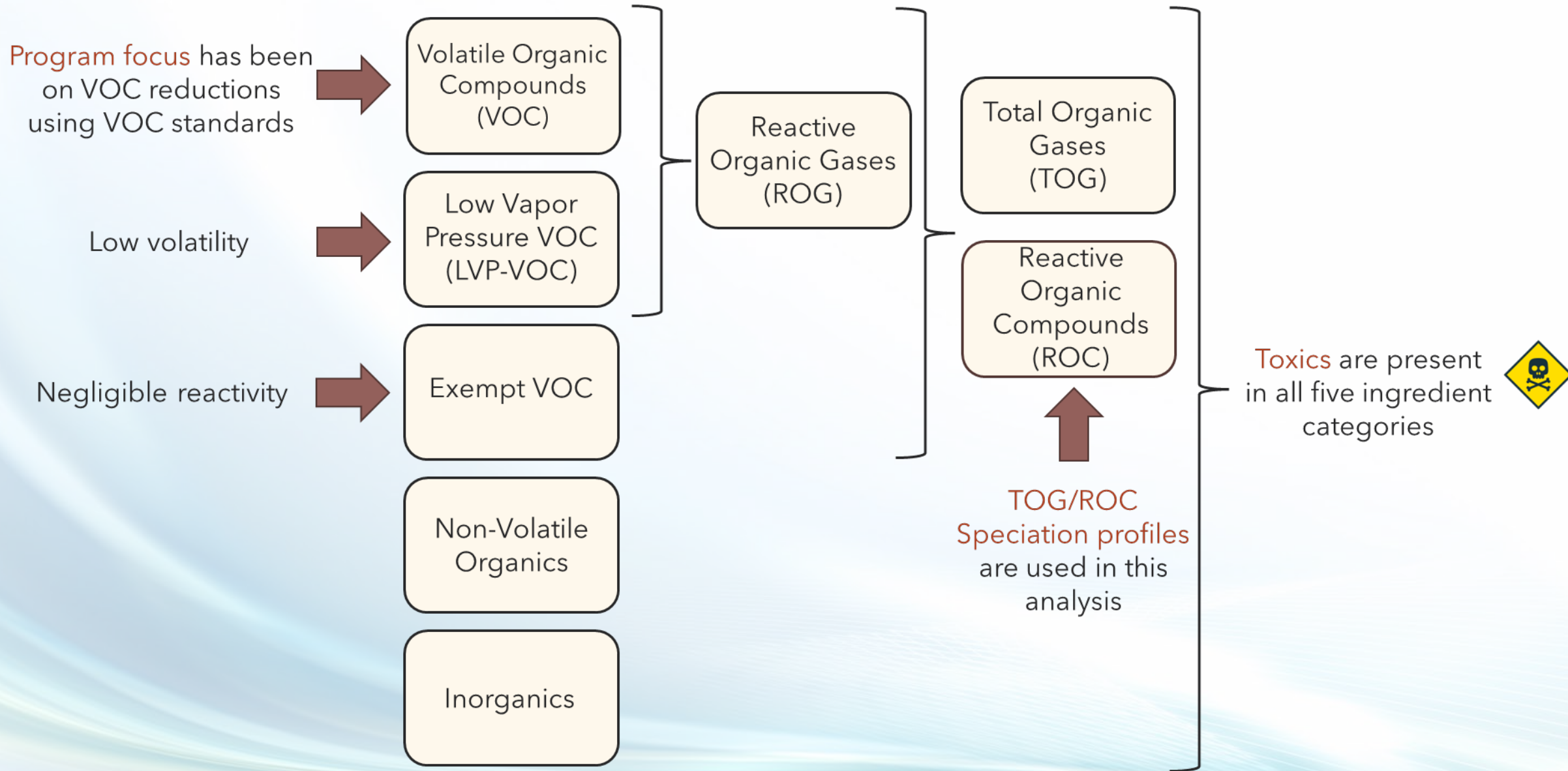
- The [CPRT for Mac OS](#) is available
- FAQ for the survey are on [CARB's webpage](#)
- Email the [Survey helpbox](#) for Kiteworks link to upload Survey
- [Instructions](#) and [videos](#) for filling out the Survey are available on the [CPRT webpage](#)



Consumer Products 2023 Survey Webinar 3: Toxicity Ranking Methodology

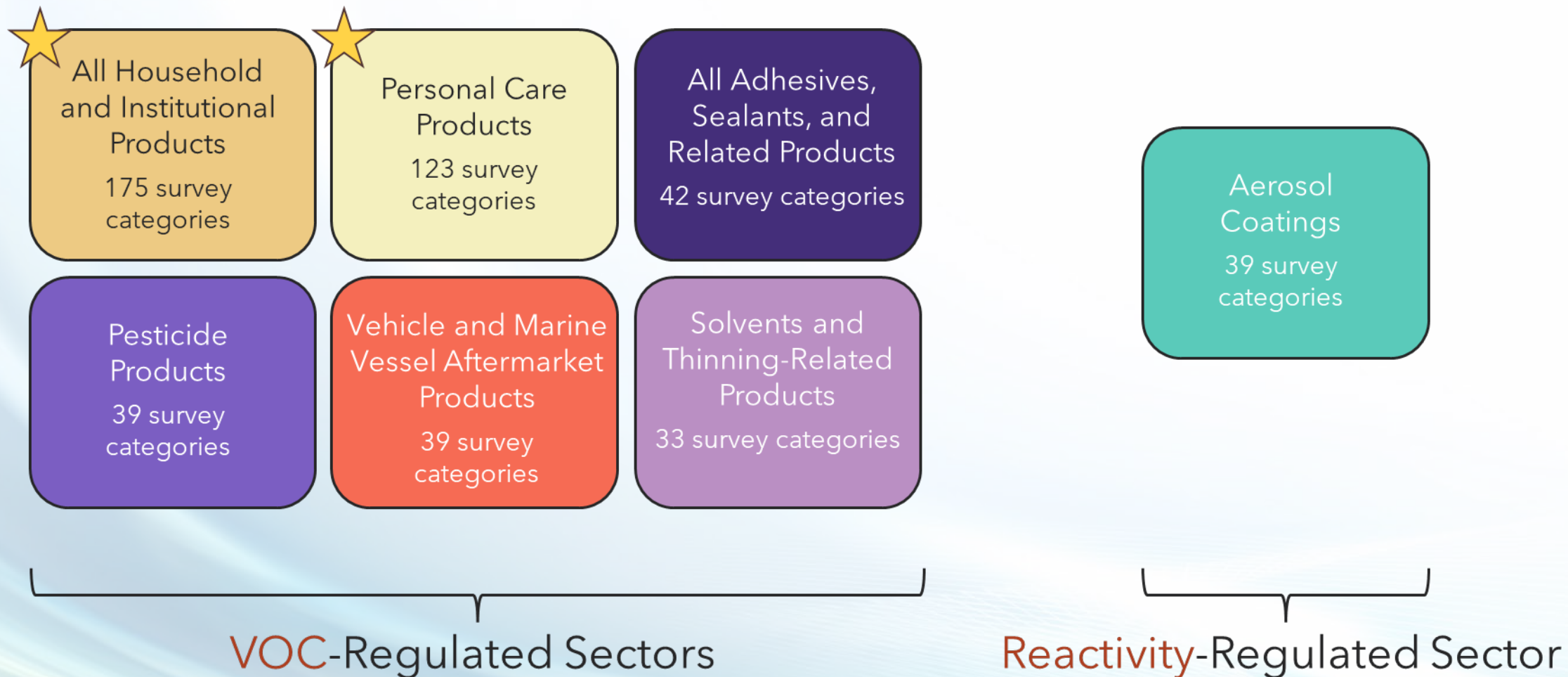
January 16, 2025

Consumer Products Inventory Definitions



Consumer Products Program

6 Sectors, 451 Survey Categories



Consumer Products Goals and Overview

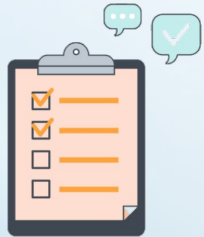
Primary driver



Regulate categories of consumer products for **Volatile Organic Compound (VOC)** reductions for **ozone** control

Prohibit and preempt unintended increases in **toxics** and **GHGs** as a result of product reformulation to meet VOC standards

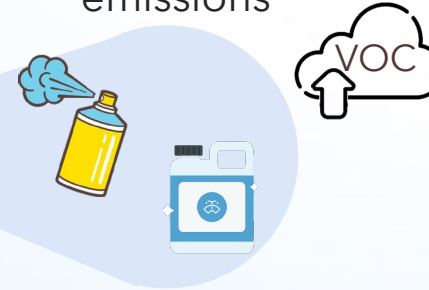
Collect data through surveys



Build consumer products inventory of TOG emissions and speciation



Identify categories with significant VOC emissions



Assess potential VOC reductions in categories



Develop regulations primarily based on VOC limits



Attention to elimination or prohibition of toxics



Schedule driven by State Implementation Plan (SIP)



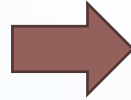
New Survey launched in 2024
Next Regulation is for 2027

Toxicity Ranking Project Objectives

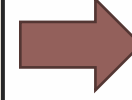


1. Rank the relative toxicity of

- Individual Chemicals
- Survey Categories



2. Evaluate toxicity categories to estimate VOC and OFP reductions for toxic prohibition scenarios



3. Select categories for inclusion in new survey and for regulatory action



What we are not doing

- Risk and exposure analysis to the general or any specific population group
- Ranking based on acute exposure



Data limitations

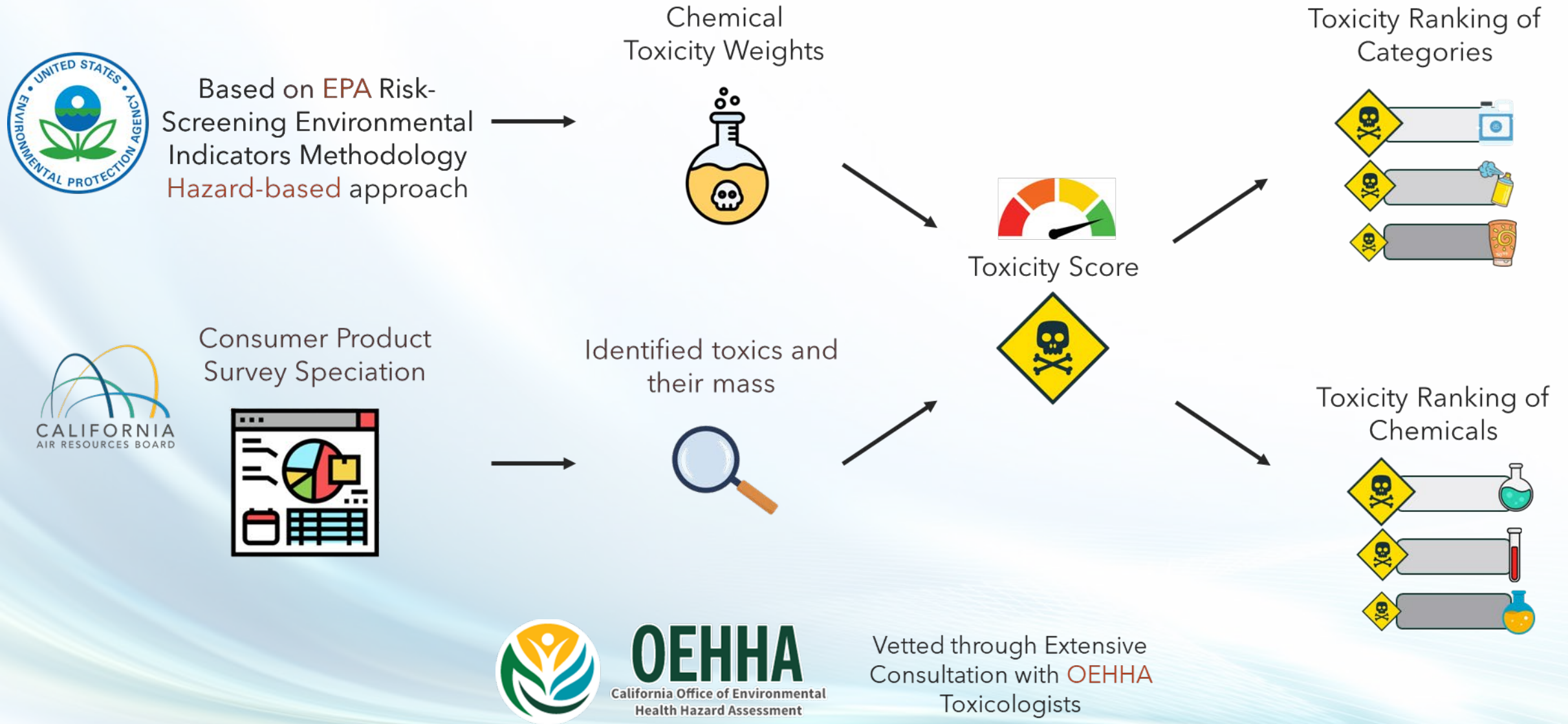
- Category-specific population characteristics associated with
 - Primary and secondary exposure
 - Use conditions
 - Frequency of use
 - Who is using the products



Constraints

- Resources
- Regulatory schedule

Consumer Products Toxicity Ranking Methodology



EPA Risk-Screening Environmental Indicators (RSEI)



Calculating a RSEI Score

Chemical Release or Transfer Quantity

Environmental Fate and Transport Modeling

Calculated Chemical Concentration

Toxicity Data

Toxicity Weight

Population Data

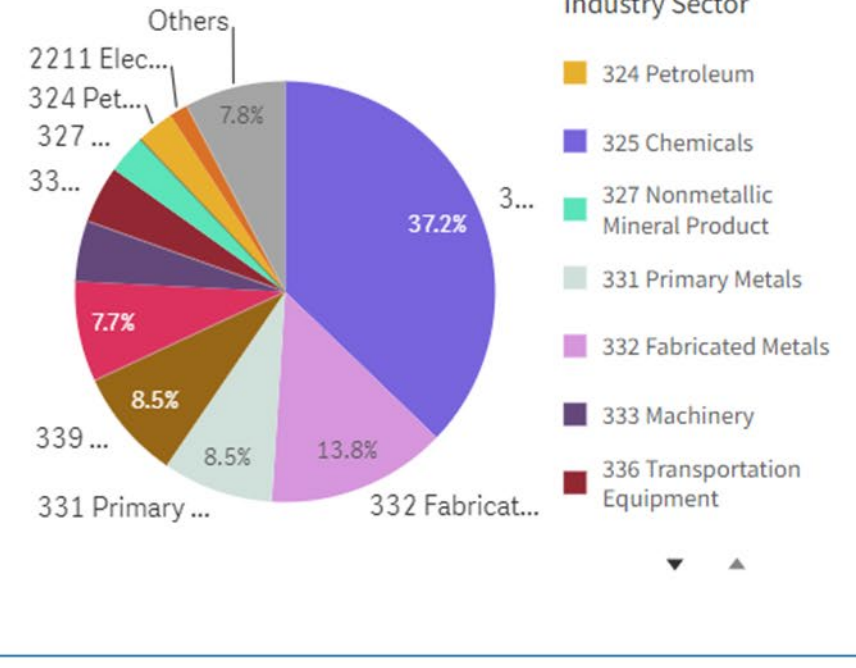
Potentially Exposed Population

Exposure Assumptions

Estimated Dose

RSEI Score

RSEI Score by Industry



U.S. EPA

Screening Tool developed to help **establish priorities** for toxics in facilities

Toxicity Weight alone used to establish priorities for Consumer Product Categories

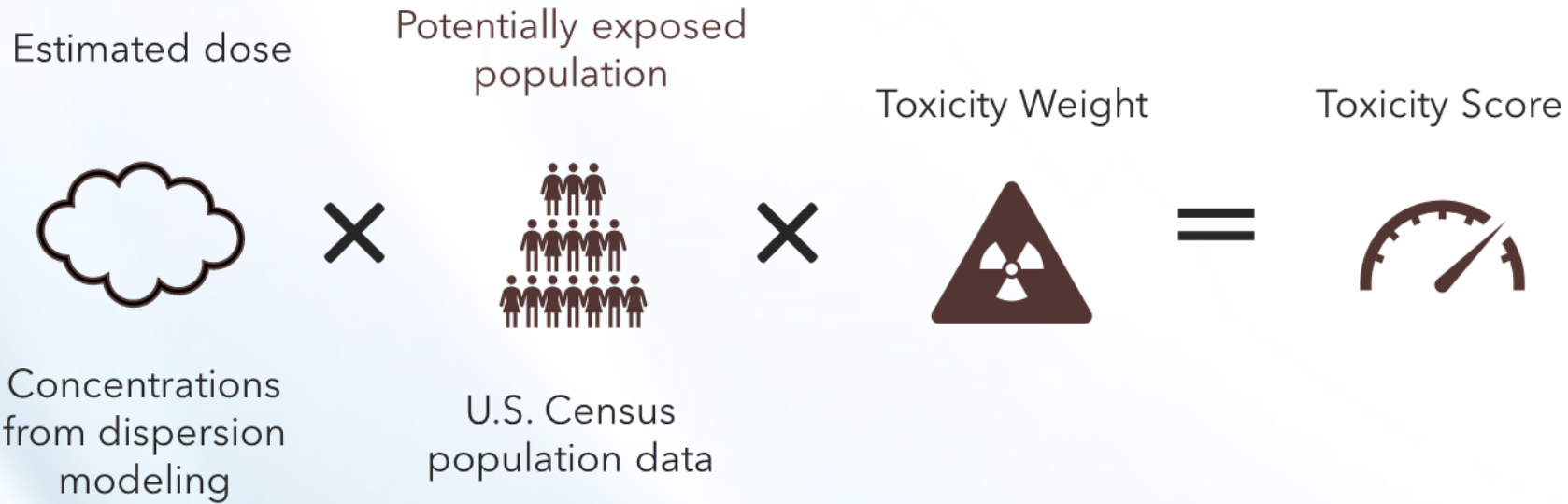
EPA Toxicity Weights



- Measure to express the toxicity of one chemical in relation to another
- Can be multiplied with any metric such as emissions or concentrations

- Only addresses chronic human exposure to toxics
- Considers cancer and non-cancer effects (reproductive, developmental, neurological, etc.)

Risk-related results



Requires

- exposure modeling
- population estimates
- population-specific exposure factors
- assumptions

Hazard-based results



- No exposure modeling or population estimates are needed
- Does not eliminate categories as a result of exposure pathway and concentration assumptions

Identifying Toxic Total Organic Gas (TOG) Ingredients

TOG Ingredients in Consumer Products

724 chemicals

Prop 65

- Chemicals known to cause cancer or birth defects or other reproductive harm
- Does not quantify toxicity
- **1000 chemicals**

EPA RSEI

- Includes toxic potency weights for chemicals
- Based on inhalation cancer risk and non-cancer reference concentrations
- **819 chemicals**

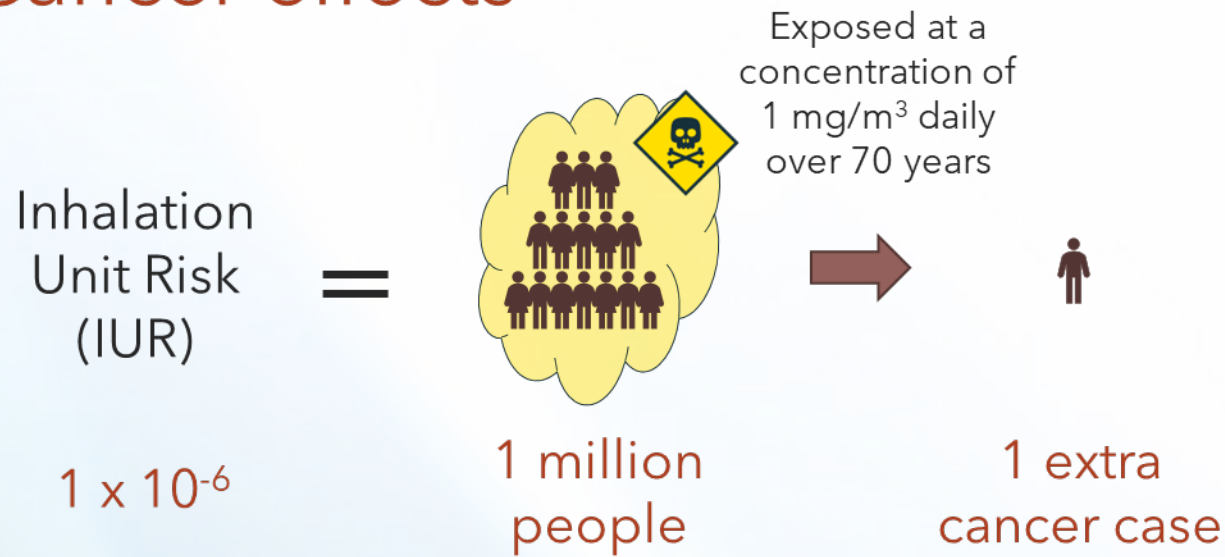
OEHHA

- AB2588
- Inhalation cancer risk and non-cancer reference concentrations
- Developed to apply to facilities
- **323 chemicals**

Toxic
TOG Ingredients
Merged using CAS #

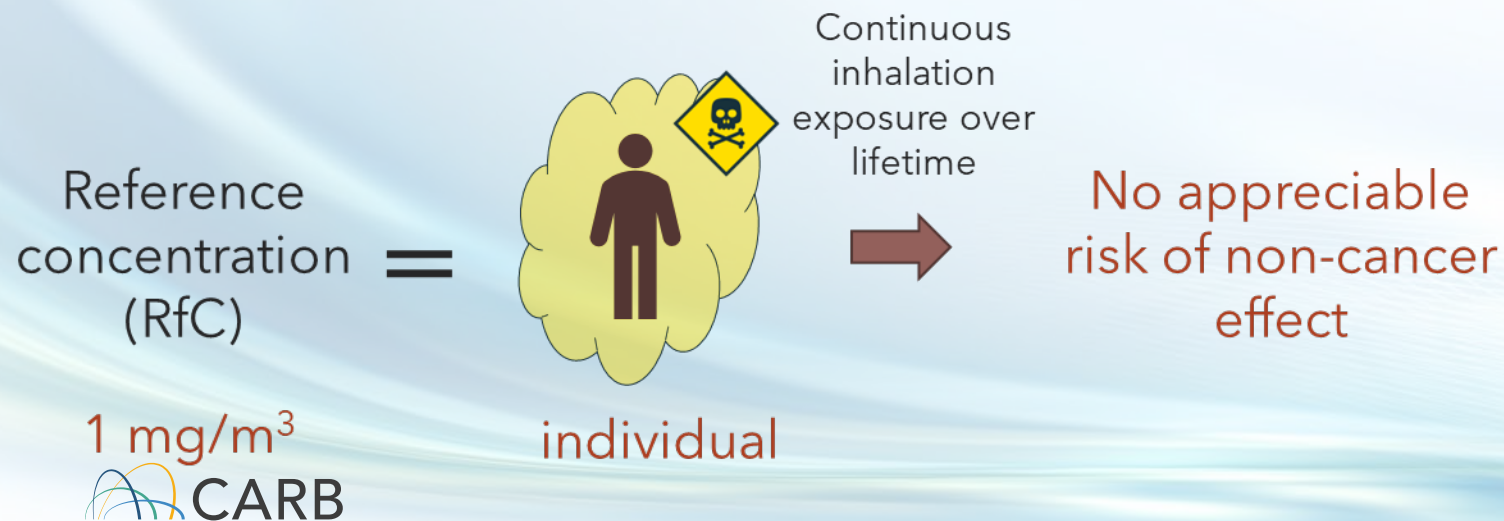
Toxics lists

Cancer effects



Expressed as a **cancer risk** per concentration

Non-cancer effects



Expressed as an upper limit concentration that would result in **no extra non cancer risk**

Calculating Toxicity Weight

Algorithms for Assigning Toxicity Weights

		Exposure Route	
		Inhalation	Oral
Type of Effect	Cancer*	IUR / 2.8e-7	OSF/ 1e-6
	Noncancer	3.5 / RfC	1 / RfD

*If the Weight of Evidence (WOE) Category is equal to C, each weight is divided by an additional factor of 10 to account for uncertainty.

Toxic potency weights
expressed as:
$$\frac{\text{kg bodyweight}}{(\text{mg/day})}$$

RSEI Methodology Document v2.3.11 (U.S. EPA, 2023)

Conversion Factors



Reference human
inspiration rate =
20 m³/day



Reference human
body weight =
70 kg

Cancer
weight

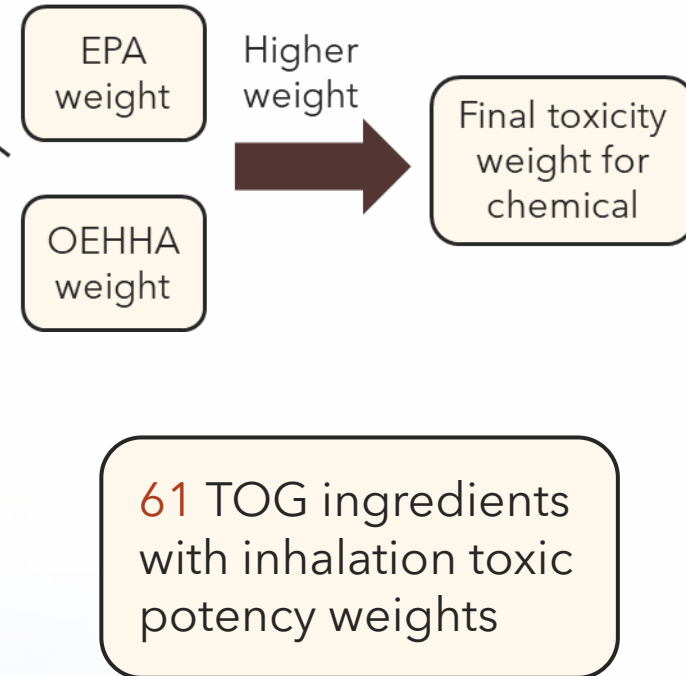
Noncancer
weight

Higher
weight

Final toxicity
weight for
chemical

Calculated Toxicity Weights of Chemicals

Chemical Name	CAS #	VOC	LVP-VOC	Exempt	Final Inhale ToxWeight	Selected ToxWeight Source	ToxicityClass Inhale
2-Chloro-1,3-butadiene	126998	100			1100000	EPA	Cancer
Vinyl Chloride	75014	100			280000	OEHHA	Cancer
Benzyl Chloride	100447	100			180000	both	Cancer
Benzene	71432	100			100000	OEHHA	Cancer
1,2-Dichloroethane	107062	100			93000	EPA	Cancer
Formaldehyde	50000	100			46000	EPA	Cancer
Glutaraldehyde	111308	100			44000	OEHHA	Non-cancer
1-Chloro-4-trifluoromethyl benzene (Parachlorobenzotrifluoride)	98566			100	31000	OEHHA	Cancer
1,4-Dioxane	123911	100			28000	OEHHA	Cancer
Perchloroethylene (Tetrachloroethylene)	127184			100	22000	OEHHA	Cancer
Trichloroethylene	79016	100			15000	EPA	Cancer
1,3-Dichloropropene	542756	100			14000	EPA	Cancer
n-Propyl Bromide	106945	100			13000	OEHHA	Cancer
Naphthalene	91203	100			12000	both	Cancer
1,1,2-Trichloroethane	79005	100			5700	both	Cancer
Peroxyacetic Acid	79210	100			4500	EPA	Non-cancer
1,4-Dichlorobenzene	106467	100			3900	both	Cancer
Methylene Chloride (Dichloromethane)	75092			100	3600	OEHHA	Cancer
Acrylic Acid	79107	100			3500	EPA	Non-cancer
Butyl Acrylate	141322	100			3500	EPA	Non-cancer
Diethanolamine	111422		100		1200	both	Non-cancer
Ethylbenzene	100414	100			890	both	Cancer
1,2,3-Trimethylbenzene	526738	100			880	OEHHA	Non-cancer
1,2,4-Trimethylbenzene	95636	100			880	OEHHA	Non-cancer
1,3,5-Trimethylbenzene	108678	100			880	OEHHA	Non-cancer
Trimethylbenzene, mixed isomers	25551137	100			880	OEHHA	Non-cancer
Chloromethane	74873	100			640	EPA	Cancer
Triethylamine	121448	100			500	EPA	Non-cancer
tert-Butyl Acetate	540885	100			460	OEHHA	Cancer
1,2-Butylene Oxide	106887	100			180	both	Non-cancer
Ethylene Glycol Monomethyl Ether	109864	100			180	EPA	Non-cancer
N,N-Dimethylformamide	68122	100			120	EPA	Non-cancer
Ethyl Acrylate	140885	100			73	EPA	Non-cancer
2-Ethoxyethanol	110805	100			50	OEHHA	Non-cancer



Top 10 Toxic Chemicals and Categories for Consumer Products

Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
7	Peroxyacetic Acid	0.08	352
8	n-Propyl Bromide	0.02	317
9	Acrylic Acid	0.03	115
10	Ethylene Glycol Monobutyl Ether	2.24	96

Rank	Category Name	Toxics Mass (tpd)	Final Toxicity Score
1	Paint Remover or Stripper	2.79	7557
2	Energized Electrical Cleaner	0.32	6200
3	Thinner/Reducer/Retardant (Motor Vehicle Coating Systems)	0.15	3508
4	Mothballs	0.58	2245
5	Paint Thinner	0.10	2024
6	Sealant or Caulking Compound - Nonchemically Curing	0.27	1900
7	Lacquer Thinner	0.34	1813
8	General Purpose Degreaser	0.06	1024
9	Plastic Pipe Cement and Primer	2.81	390
10	Sanitizer (nonaerosol)	0.10	265

Top Toxics have already been Prohibited in Key Categories

Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
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10	Ethylene Glycol Monobutyl Ether	2.24	96

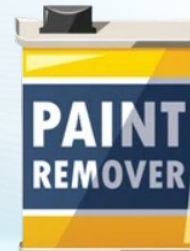
Prohibited in
43
Consumer Product
Categories

[Table 94509 \(m\)\(1\)\(A\). The California Consumer Products Regulations. CARB, 2022.](#)

EPA Prohibited Methylene Chloride in Paint Strippers in 2019

Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
7	Peroxyacetic Acid	0.08	352
8	n-Propyl Bromide	0.02	317
9	Acrylic Acid	0.03	115
10	Ethylene Glycol Monobutyl Ether	2.24	96

Rank	Category Name	Final Toxicity Score
1	Paint Remover or Stripper	7555.93
2	Plastic Pipe Cement and Primer	255.57
3	Carburetor or Fuel-Injection Air Intake Cleaner	42.38
4	Penetrant	4.60
5	Other sealants and caulks	1.40
6	Wick Lamp Fuel, Scented and Nonscented	1.18
7	Bug and Tar Remover (non-automotive)	0.34
8	Gear, Chain, or Wire Lubricant (nonaerosol)	0.02
9	Multi-purpose Dry Lubricant	0.01
10	Other adhesives	0.00
11	General Use Hand or Body Cleaner or Soap	0.00
12	Dish Detergent/Soap (manual)	0.00
13	Other fabric, carpet, and upholstery care products	0.00
14	Carpet and Upholstery Cleaner (nonaerosol - dilutable)	0.00
15	General Purpose Degreaser (nonaerosol)	0.00



We plan to survey the "Paint Remover or Stripper" category to capture the impact of methylene chloride prohibition by EPA in 2019



Perc and TCE: Essential Non-Flammable Solvents for Safety

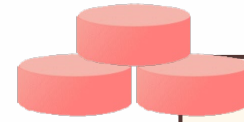
Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
7	Peroxyacetic Acid	0.08	352
8	n-Propyl Bromide	0.02	317
9	Acrylic Acid	0.03	115
10	Ethylene Glycol Monobutyl Ether	2.24	96

Rank	Category Name	Final Toxicity Score
1	Energized Electrical Cleaner	4746.74
2	General Purpose Degreaser (labeled not for retail sale)	762.92
3	Other vehicle and marine vessel maintenance and repair products	79.42
4	Gear, Chain, or Wire Lubricant (aerosol)	39.29
5	Other solvent and thinning products	30.76
6	General Purpose Cleaner (aerosol)	9.62
7	Single Purpose Cleaner	5.29
8	Penetrant	0.78
9	Gear, Chain, or Wire Lubricant (nonaerosol)	0.31
10	Multi-purpose Lubricant (including solid and semisolid products)	0.31
11	Silicone-based Multi-purpose Lubricant	0.22

Rank	Category Name	Final Toxicity Score
1	Energized Electrical Cleaner	592.91
2	General Purpose Degreaser (labeled not for retail sale)	107.57
3	Plastic Pipe Cement and Primer	63.10
4	Single Purpose Cleaner	10.16
5	General Purpose Degreaser (aerosol)	4.98
6	Other office supply products	1.96
7	Other lubricants and penetrants	1.01
8	Rubbing and Polishing Compound (other than automotive)	0.76
9	Belt Dressing	0.29
10	Single Purpose Degreaser	0.21
11	Silicone-based Multi-purpose Lubricant	0.13
12	Multi-purpose Lubricant (including solid and semisolid products)	0.00

1,4-Dichlorobenzene in Mothballs

Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
7	Peroxyacetic Acid	0.08	352
8	n-Propyl Bromide	0.02	317
9	Acrylic Acid	0.03	115
10	Ethylene Glycol Monobutyl Ether	2.24	96



In 2004, CARB prohibited 1,4-Dichlorobenzene from **Solid Air Fresheners** and **Toilet/Urinal Products**

Rank	Category Name	Final Toxicity Score
1	Mothballs	2244.78



- CARB does not have the **authority** to regulate 1,4-Dichlorobenzene as a **pesticide** in mothballs
- Authority is under the **Department of Pesticide Regulation**

Promote Program's Toxics Priorities

PCBTF is the **top ranked toxic** among 451 product categories based on the Consumer Products Toxicity Ranking Methodology



Already prohibited in 2021 in **10** categories

[Table 94509 \(m\)\(1\)\(B\)](#)



Seek to explore **prohibiting** continued use of **PCBTF** in categories currently found

Rank	Chemical Name	Mass (tpd)	Final Toxicity Score
1	Parachlorobenzotrifluoride (PCBTF)	0.32	9853
2	Methylene Chloride (Dichloromethane)	2.18	7861
3	Perchloroethylene (Tetrachloroethylene)	0.26	5676
4	1,4-Dichlorobenzene	0.58	2245
5	Trichloroethylene	0.11	1654
6	Glutaraldehyde	0.01	417
7	Peroxyacetic Acid	0.08	352
8	n-Propyl Bromide	0.02	317
9	Acrylic Acid	0.03	115
10	Ethylene Glycol Monobutyl Ether	2.24	96

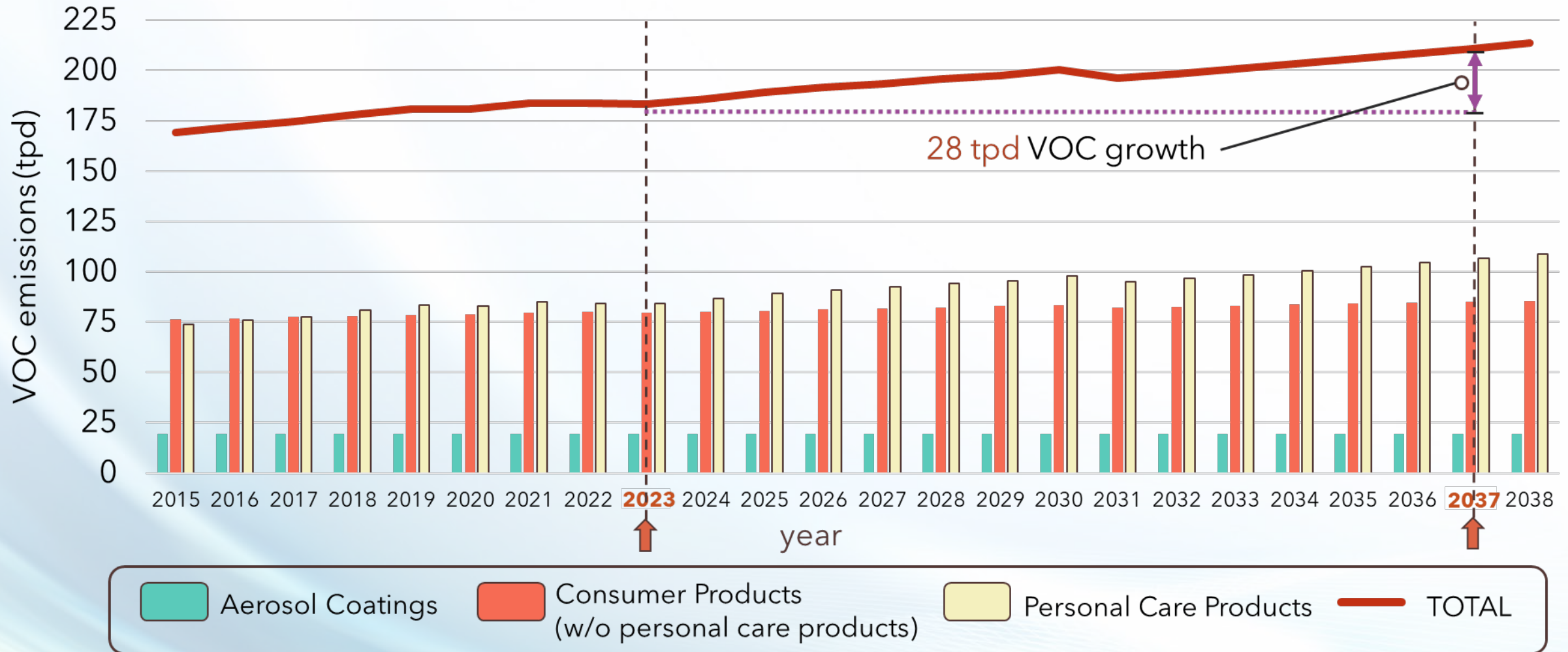
Rank	Category Name	Final Toxicity Score
1	Thinner/Reducer/Retardant (Motor Vehicle Coating Systems)	3508.16
2	Paint Thinner (nonaerosol)	2022.73
3	Sealant or Caulking Compound -- Nonchemically Curing	1875.23
4	Lacquer Thinner	1807.97
5	Footwear or Leather Care Product (all other forms)	223.07
6	Multi-purpose Solvent (nonaerosol)	156.53
7	Footwear or Leather Care Product (aerosol)	126.71
8	Clean Up Solvent	54.80
9	Rust Preventative or Rust Control Lubricant (aerosol)	20.83
10	Undercoating (aerosol only)	16.88
11	Carpet and Upholstery Cleaner (nonaerosol - dilutable)	3.78
12	General Purpose Degreaser (aerosol)	3.77
13	Metal Polish/Cleanser (aerosol)	1.42
14	Cutting or Tapping Oil (aerosol)	1.12
15	General Purpose Degreaser (nonaerosol)	1.08
16	Spot Remover (nonaerosol)	1.06
17	Sealant or Caulking Compound -- Chemically Curing	0.79
18	Multi-purpose Dry Lubricant	0.38
19	Penetrant	0.21

Parachlorobenzotrifluoride (PCBTF) Distribution

	Category Name	PCBTF Toxicity Score	Category Toxicity Score	PCBTF Percentage (%)
1	Thinner/Reducer/Retardant (Motor Vehicle Coating Systems)	3508.18	3508.43	99
2	Paint Thinner (nonaerosol)	2022.73	2023.82	99
3	Sealant or Caulking Compound -- Nonchemically Curing	1875.23	1900.45	99
4	Lacquer Thinner	1807.97	1813.42	99
5	Footwear or Leather Care Product (all other forms)	223.07	223.22	99
6	Multi-purpose Solvent (nonaerosol)	156.53	156.70	99
7	Footwear or Leather Care Product (aerosol)	126.71	127.37	99
8	Clean Up Solvent	54.80	54.84	99
9	Rust Preventative or Rust Control Lubricant (aerosol)	20.83	20.84	99
10	Undercoating (aerosol only)	16.88	17.03	99
11	Carpet and Upholstery Cleaner (nonaerosol - dilutable)	3.78	11.16	34
12	General Purpose Degreaser (aerosol)	3.77	14.32	26
13	Metal Polish/Cleanser (aerosol)	1.42	1.43	99
14	Cutting or Tapping Oil (aerosol)	1.12	1.14	98
15	General Purpose Degreaser (nonaerosol)	1.08	14.29	8
16	Spot Remover (nonaerosol)	1.06	1.64	65
17	Sealant or Caulking Compound -- Chemically Curing	0.79	10.96	7
18	Multi-purpose Dry Lubricant	0.38	0.41	92
19	Penetrant	0.21	5.62	4

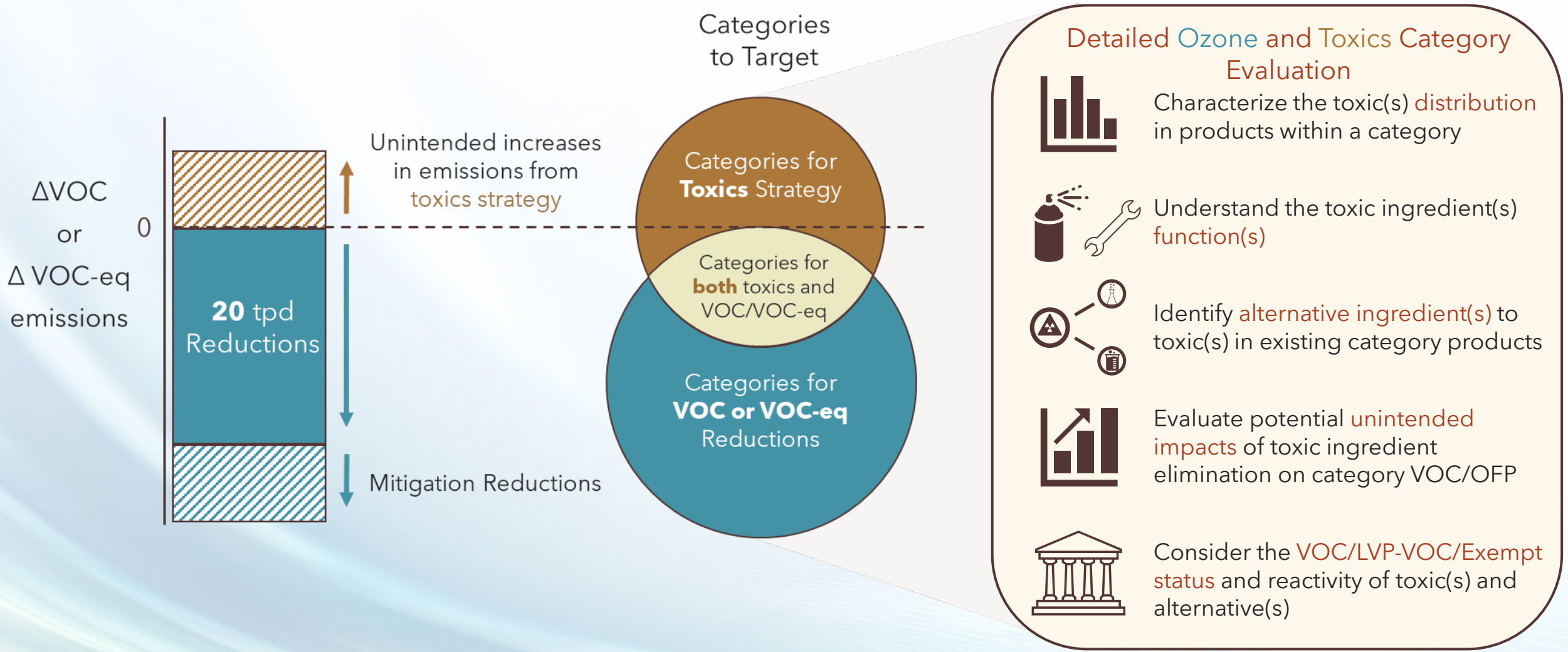
2022 SIP Commitment

Statewide Consumer Products and Aerosol Coatings VOC Inventory Growth

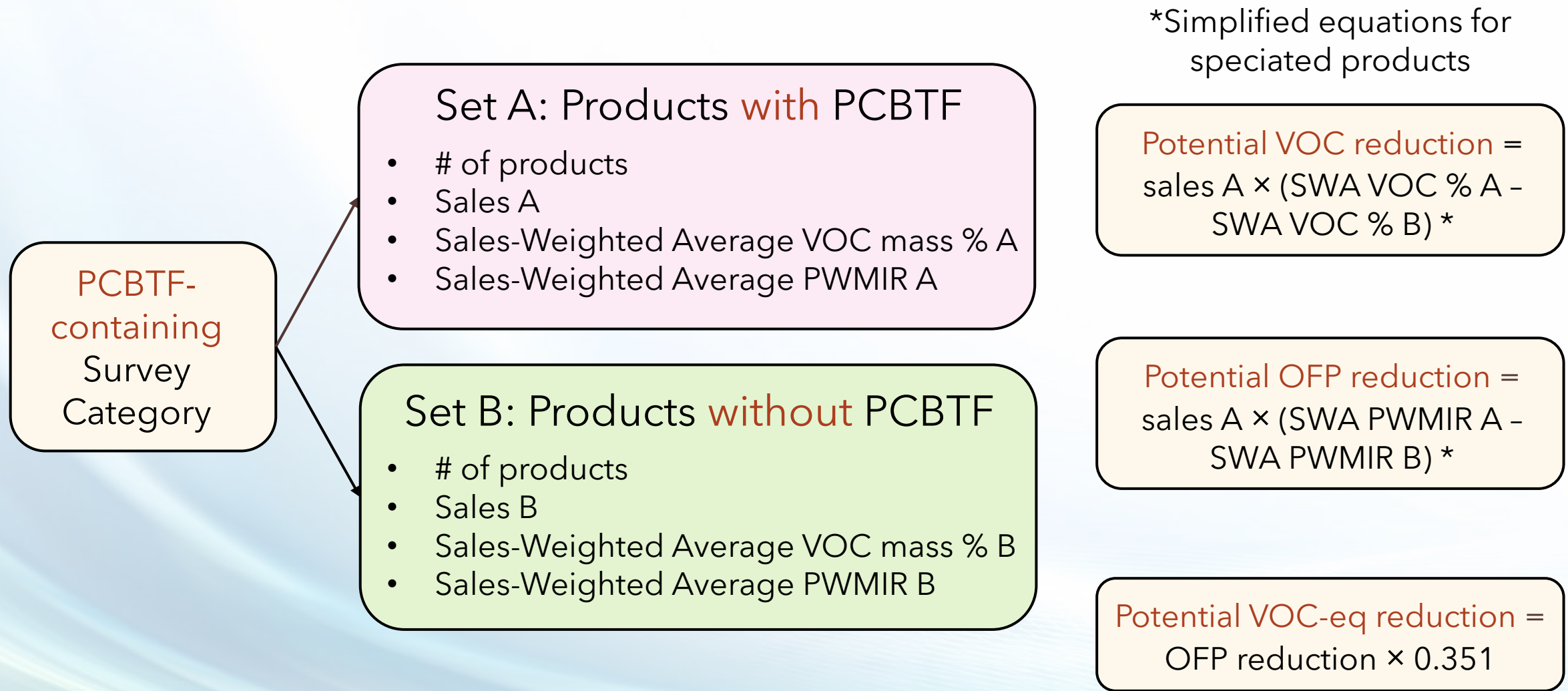


SIP Reduction Commitment by 2037 = Remediate majority of 28 tpd VOC growth = 20 tpd Reductions

Statewide SIP Reduction Commitment by 2037



How would prohibition of PCBTF affect emissions?

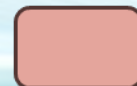


PCBTF Elimination : Converting OFP impact to VOC-eq

Catcode	Category Name	Strategy Type	# of products	2037 Sales (tpd)	2037 OFP (tpd)	SWA VOC %	SWA PWMIR	Δ VOC (tpd)	Δ OFP (tpd)	Δ VOC-eq (tpd)
60223	Thinner/Reducer/Retardant (Motor Vehicle Coating Systems)	with PCBTF	21	0.17	0.03	0.54	0.18	0.07 ↑	0.09 ↑	0.03
		without PCBTF	47	0.56	0.41	44.81	0.73			
		unspeciated	1	0.00	0.00	34.69	0.60			
70117	Undercoating (aerosol only)	with PCBTF	2	0.01	0.01	38.95	0.83	0.00 ↓	0.00 ↓	0.00
		without PCBTF	32	0.14	0.11	35.42	0.80			
		unspeciated	30	0.43	0.35	35.59	0.81			
60216	Paint Thinner (nonaerosol)	with PCBTF	12	1.64	1.10	0.33	0.67	0.45 ↑	0.42 ↑	0.15
		without PCBTF	79	2.34	2.00	19.93	0.85			
		unspeciated	29	1.58	1.23	11.83	0.78			
10210	Sealant or Caulking Compound -- Nonchemically Curing	with PCBTF	148	0.42	0.09	12.50	0.20	-0.05 ↓	-0.07 ↓	-0.02
		without PCBTF	685	30.18	1.87	0.97	0.06			
		unspeciated	401	3.38	0.22	1.13	0.06			
60211	Lacquer Thinner	with PCBTF	12	0.34	0.12	2.57	0.35	0.03 ↑	0.07 ↑	0.03
		without PCBTF	50	4.21	2.30	10.79	0.55			
		unspeciated	10	0.64	0.34	10.18	0.53			
21303	Footwear or Leather Care Product (all other forms)	with PCBTF	61	0.08	0.04	54.90	0.46	-0.07 ↓	-0.05 ↓	-0.02
		without PCBTF	542	1.88	0.15	2.24	0.08			
		unspeciated	286	1.20	0.12	4.43	0.10			
60213	Multi-purpose Solvent (nonaerosol)	with PCBTF	4	0.09	0.06	0.56	0.64	0.00 ↑	-0.02 ↓	-0.01
		without PCBTF	88	6.10	2.79	1.55	0.46			
		unspeciated	45	1.19	0.55	1.54	0.46			
21301	Footwear or Leather Care Product (aerosol)	with PCBTF	7	0.02	0.02	74.58	0.94	-0.01 ↓	-0.02 ↓	-0.01
		without PCBTF	38	0.31	0.14	35.86	0.45			
		unspeciated	62	0.19	0.09	38.15	0.48			
Net VOC and OFP Impacts of PCBTF Elimination								0.43 ↑	0.44 ↑	0.16

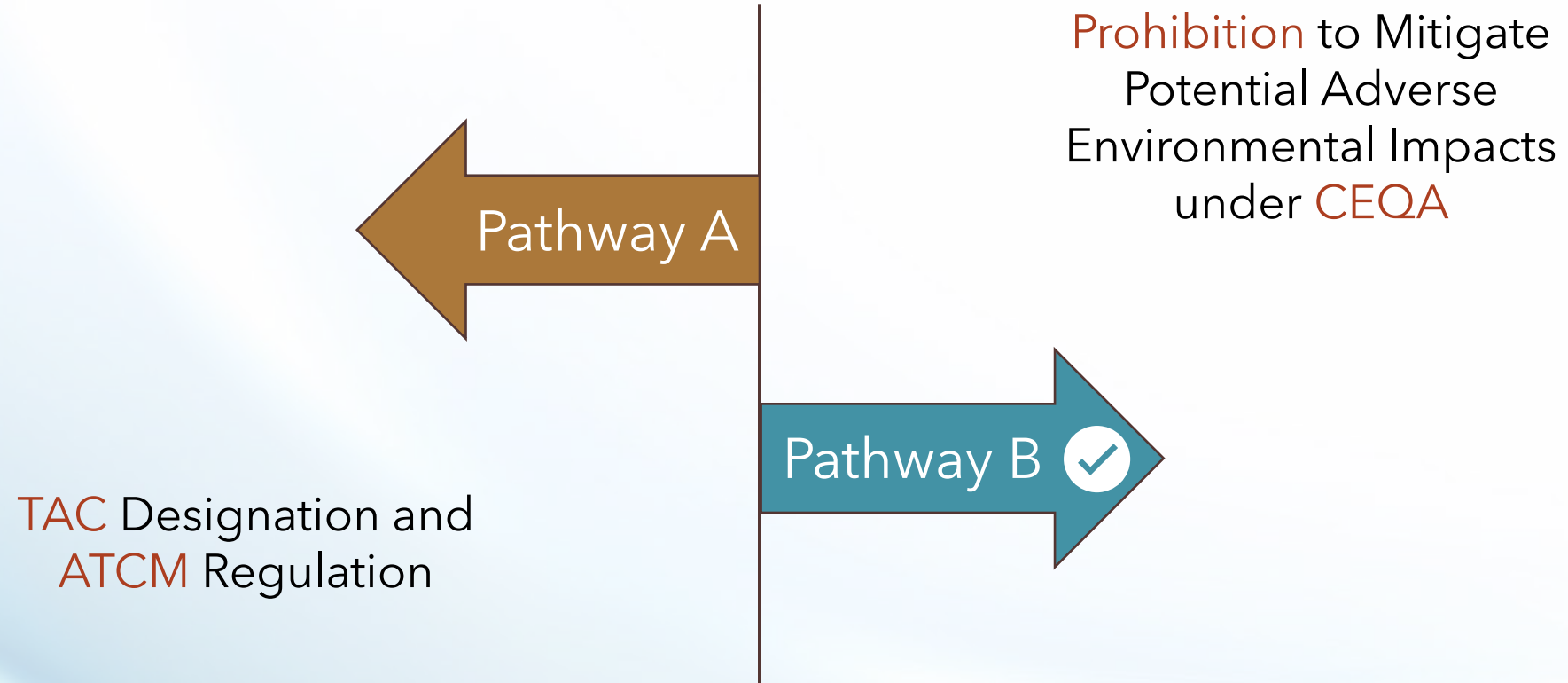


Reduction in VOC-eq



Increase in VOC-eq

Two Pathways for Toxics Elimination



TAC Designation and ATCM Regulation

Pathway A

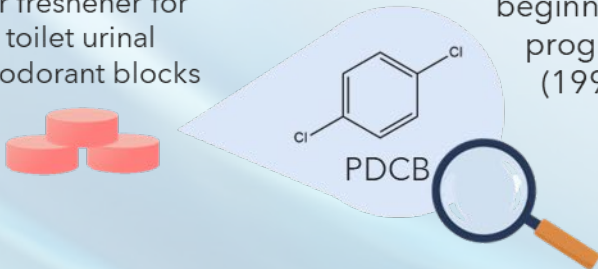


TAC
Identification

CARB evaluates need
and appropriate degree
of regulation

Example: Para-dichlorobenzene (PDCB)

air freshener for
toilet urinal
deodorant blocks



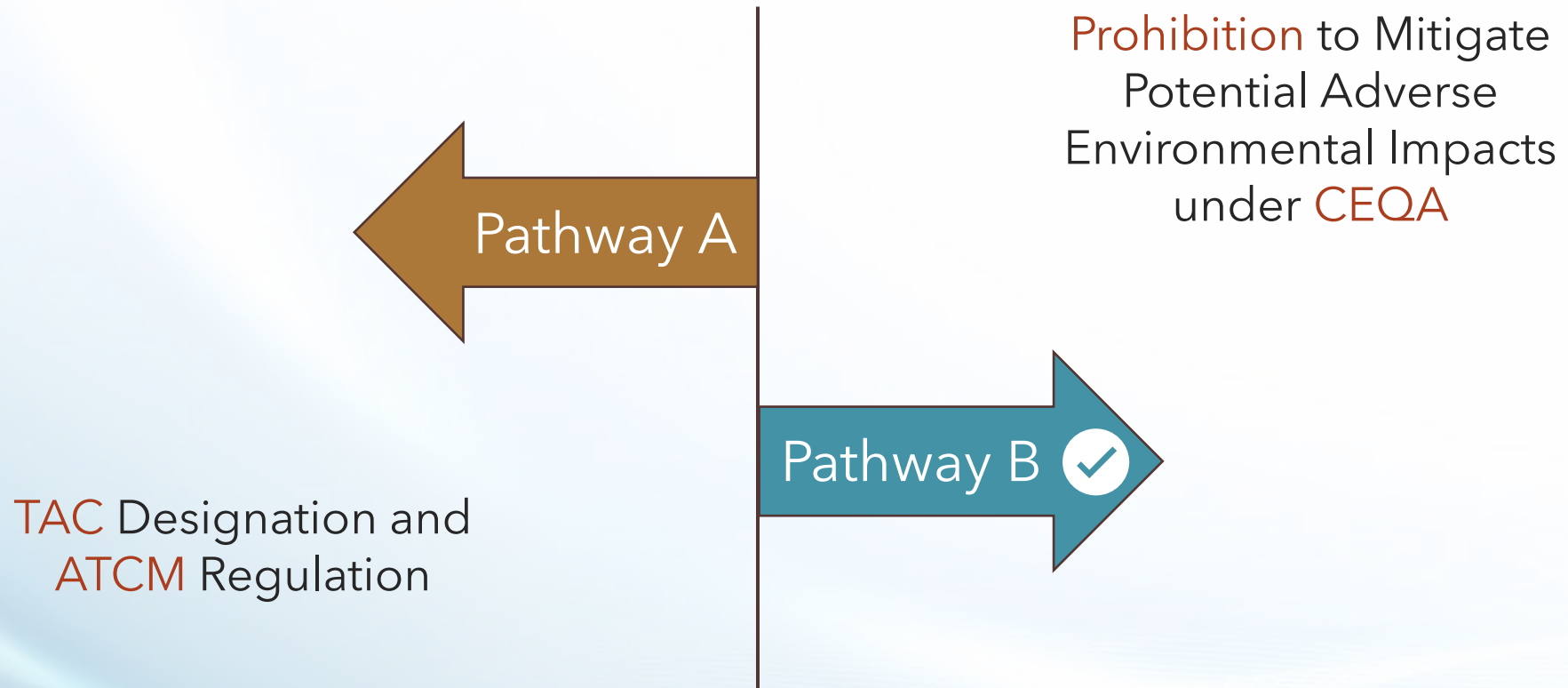
Tracked since
beginning of
program
(1991)

Alternative
ingredients
became
available

Regulation
prohibiting PDCB
in deodorant
blocks in 2004



Two Pathways for Toxics Elimination



Prohibition to Mitigate Potential Adverse Environmental Impacts under CEQA

Pathway B



Provide ample scientific evidence implicating a toxic to a significant impact



Example: Chlorinated Solvents

- Methylene chloride (MeCl)
- Perchloroethylene (Perc)
- Trichloroethylene (TCE)

- Very low ozone-forming capability
- Prohibition relied on availability of alternative solvents

Chlorinated Solvents

- In 2000 and 2004, CARB **prohibited** the three chlorinated solvents in:
 - Adhesives
 - Cleaners
 - Leather Care Products



Chlorinated solvents

Non-toxic solvents



VOC limit

Products reformulated with alternative non-toxic solvents to meet new VOC limits

Regulated as
Hazardous Air Pollutants (HAP) by EPA
and
Toxic Air Contaminants (TAC) by CARB

PCBTf Timeline



PCBTf is **excluded** from the definition of **VOC** by CARB

1997



PCBTf has not been identified as a **TAC** by CARB

Present

December 1994

PCBTf is **excluded** from the definition of **VOC** by U.S. EPA

Excluded on the basis that compounds have **negligible contribution** to tropospheric ozone formation



June 2019

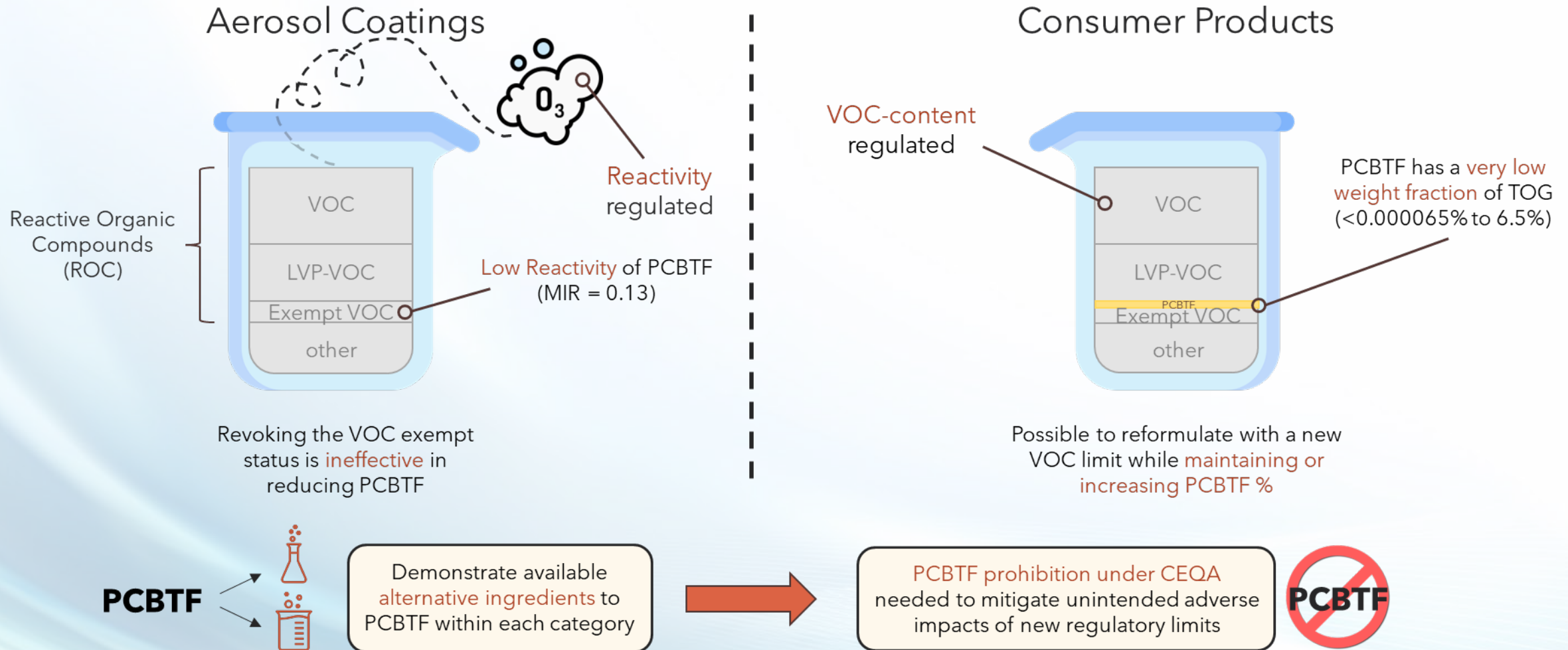
Listed as a substance "known to the state to cause **cancer**" under Prop 65

August 2020

OEHHA adopted a Cancer Inhalation Unit Risk (IUR) Value



PCBTf is the top ranked toxic for both



Survey Timeline





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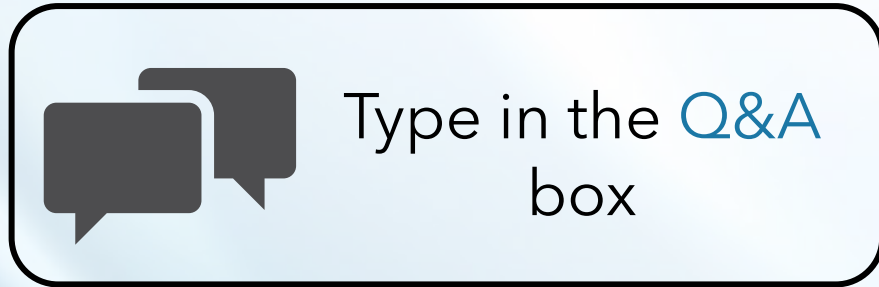
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Questions

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