Volatile Organic Compounds in Consumer Products and Coatings Rulemaking

DEQ Air Quality Planning

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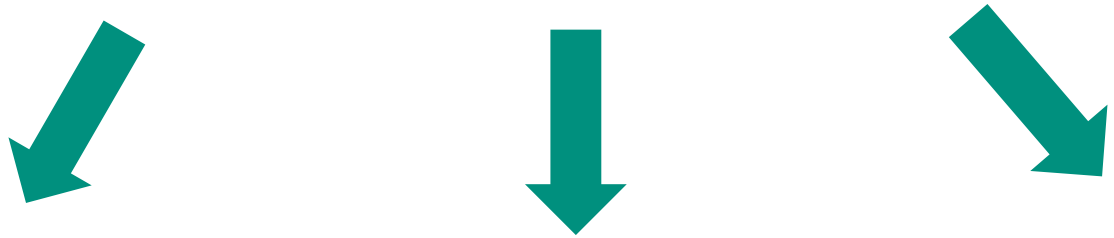
Goal of informational item

- **Orient the commission on the issue** and context around DEQ's rulemaking to limit VOCs in consumer products and coatings, including:
    - **Basic science around VOCs** and air quality
    - **Ozone issues in Oregon**
    - **Highlights of rulemaking process** and issues discussed by RAC

Volatile Organic Compounds



Turn into gas when exposed to sunlight or air

Has carbon molecules

Has two or more different chemical elements (such as carbon + oxygen)

- Diverse and ubiquitous class of compounds, found in many different products that consumers and industry utilize
- High vapor pressure, low water solubility

What are the major issues with VOC emissions?

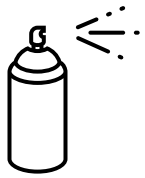
- Ozone formation
- Increasing the haze that impacts natural areas (regional haze)
- Contributes to formation of fine particulate matter
- Short-term and long-term health impacts

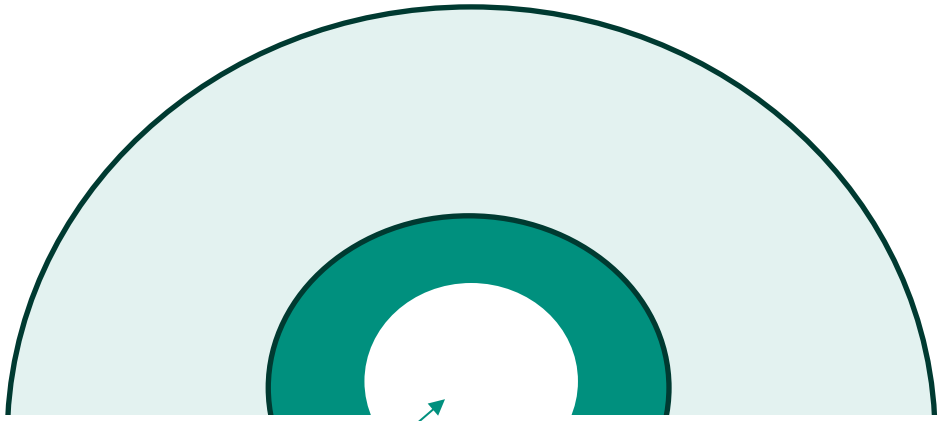
How do VOC emissions impact ozone?

- Volatile organic compounds are a major ingredient (precursor) for the formation of ground-level ozone

Sunlight

NOx + **VOCs** → ground-level O_3 (ozone)





First 6.2 miles of atmosphere is considered ground-level (troposphere), where **ozone can be harmful** to our health

The next 31 miles of atmosphere (stratosphere) is where **ozone is more helpful** to protect from harmful rays from the sun

What are the health risks of exposure to VOCs or ozone?

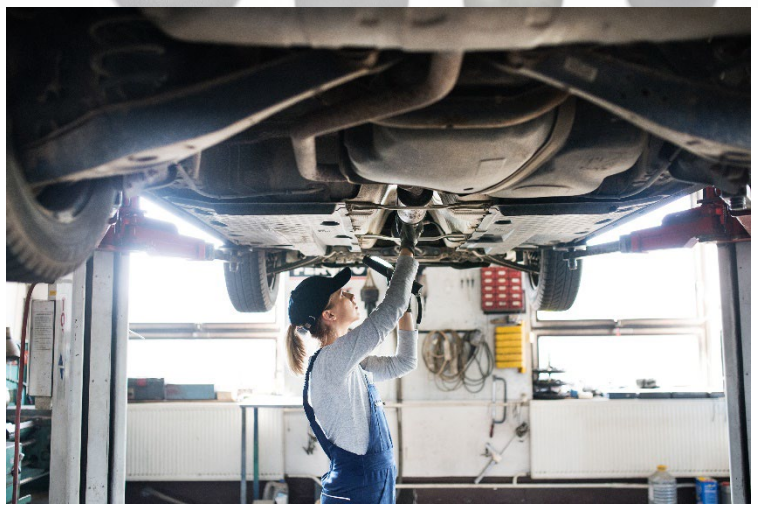
Example health risks

- Aggravation of asthma and other respiratory issues
- Headache or skin irritation
- Nose, throat and eye inflammation
- Contribute to risks of cancer and cardiovascular events
- Reproductive issues

Rulemaking is focused on evaluating options for reducing VOC emission from **consumer products** and **architectural and industrial maintenance coatings**.

Consumer products

- Personal care products
- Cleaners and disinfectants
- Automotive care products



Architectural and industrial maintenance coatings

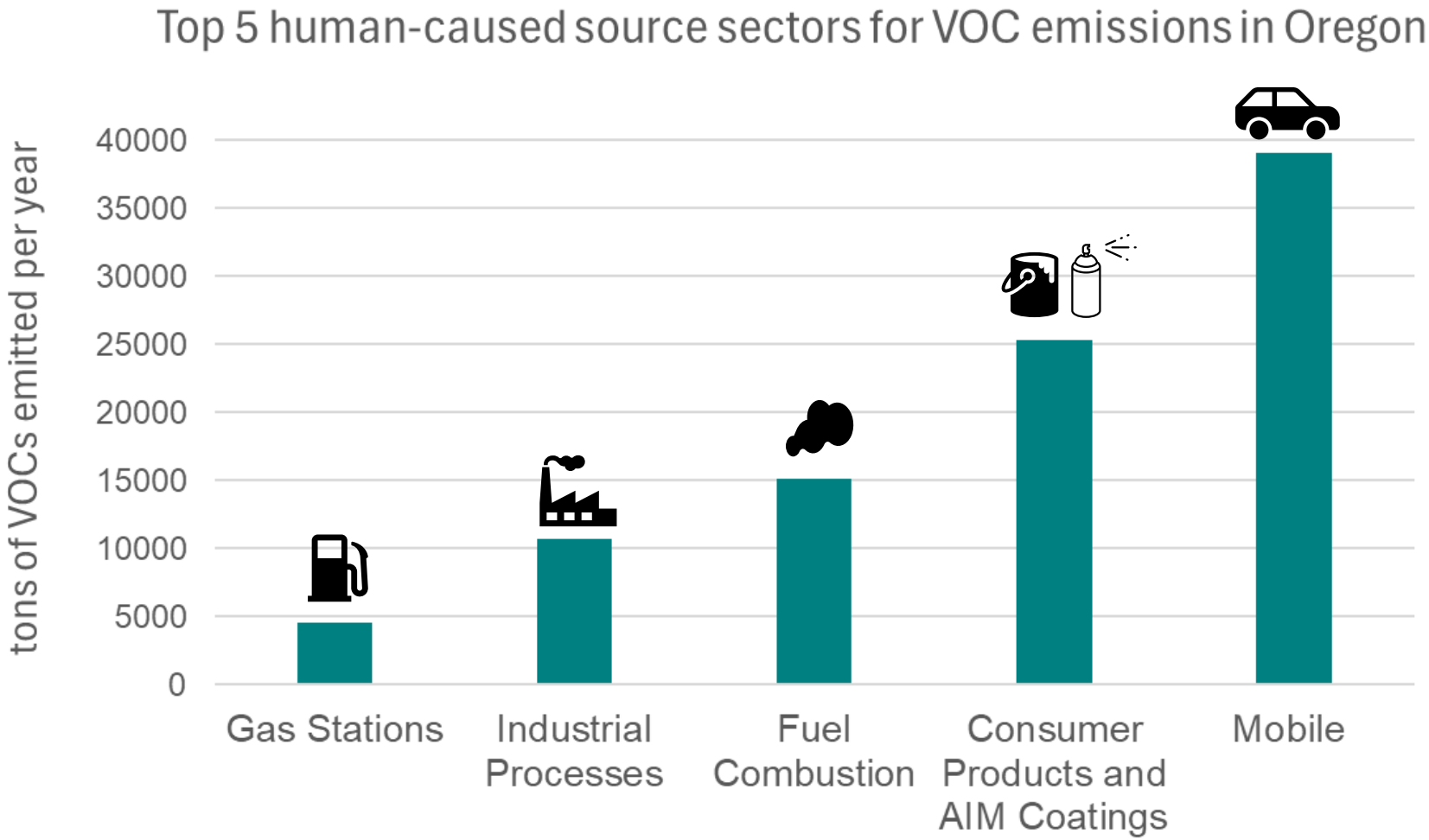
- Paint
- Primers and undercoatings
- Varnishes and finishes

What do VOC emissions and ozone trends look like in Oregon?

Natural sources

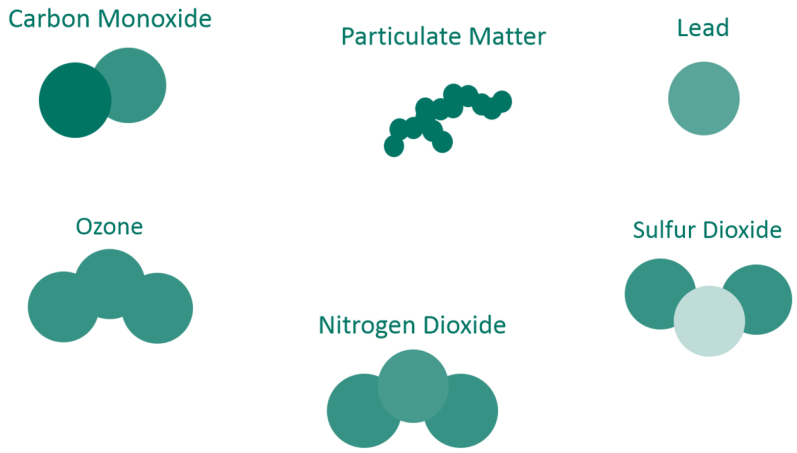
Emissions from forests and wildfires

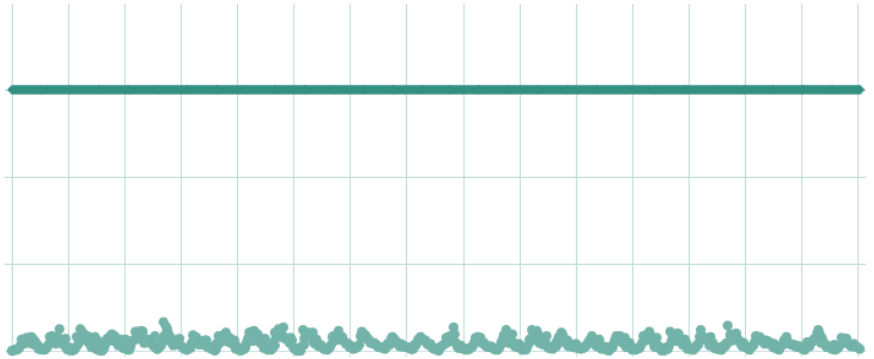
These products are an important source of human caused emissions



Ozone and the National Ambient Air Quality Standards

The **National Ambient Air Quality Standards** are limits associated with the Clean Air Act on the atmospheric concentration of **six criteria pollutants** associated with smog, acid deposition, and other environmental/health risks.





Criteria pollutant concentrations should be under threshold levels set by EPA.

Why this rulemaking now?

Several areas have ozone levels trending close to the allowable federal limit, including the metropolitan areas of Portland, Salem, and Medford.


8 hour ozone
std = 70 ppb
ozone (ppb)
design values
75
70
65
60
55
2010
2012
2014
2016
2018
2020
2022
2024
Portland
Medford
Eugene
Salem
Hermiston
Bend

	2023		2024	
Monitoring Area	Maximum Daily Eight-hour Average, ppb	Number of Days Above Eight-Hour NAAQS	Maximum Daily Eight-hour Average, ppb	Number of Days Above Eight-Hour NAAQS
Eugene Metro	65	0	74	1
Hermiston	66	0	75	2
Medford	68	0	72	1
Portland Metro	76	3	78	4
Salem Metro	71	1	79	2
Bend	nd	nd	73	1

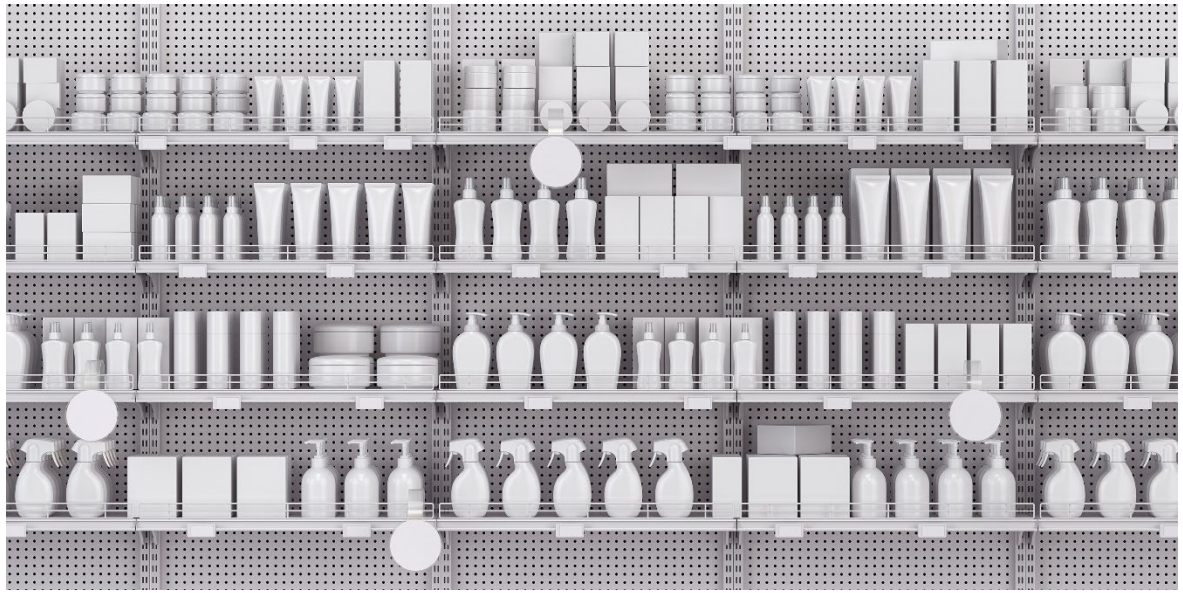
Does the federal government control VOCs as an ozone precursor?

- In 1998, EPA set National Volatile Organic Compound Emission Standards for Consumer Products
  - Set **VOC content limits for 24 categories of consumer products**

- Estimated to reduce VOC emissions by 90,000 tons per year (tpy), but in dense metropolitan areas, there are often still issues with ozone

What are other states doing?

~ 20 other states or jurisdictions plus Canada have rules (or are developing rules) to limit VOC emissions from consumer products and/or architectural and industrial maintenance coatings



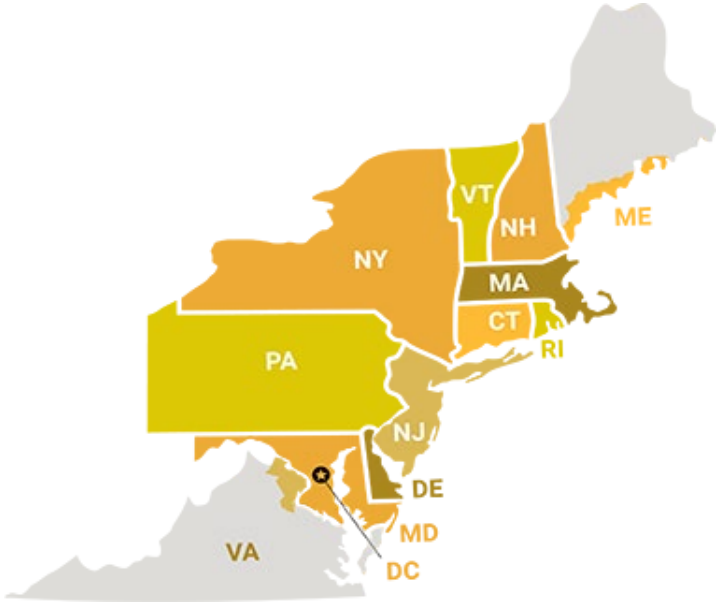
What regulatory options has DEQ considered? …

CARB regulatory models

- Extensive rules for consumer products
- Some of the most stringent rules for consumer products the U.S.
- Program includes comprehensive enforcement with product testing, penalties for violators
- Also have “suggested control measure” that many air districts in CA adopted – these are model rules for architectural coatings

OTC regulatory models

OZONE TRANSPORT COMMISSION



- Have 5 different phases of model rules for consumer products

Phase 1 → Phase 5

Least stringent

Most stringent

- Also have separate model rules for AIM coatings with just 2 phases of those model rules

Example product VOC limits

Current and Proposed VOC Limits (% by weight) for Consumer Products

Product Category	CARB Limits	EPA Limits	DC, IL, IN, MA, ME, NJ, PA[2], VA[3]	CO, CT, DE, MD[4], MI, NH, NY,OH, RI, UT[5]	OTC Regulatory & Technical Guideline Phase V	Contingency Colorado[13]	Canada
			OTC Phase II	OTC Phase III / IV	OTC Phase V	OTC Phase V	
Aerosol Coatings (Various Categories)	17 CCR §§ 94520-28	40 CFR 59 Subpart E	40 CFR 59 Subpart E	40 CFR 59 Subpart E	40 CFR 59 Subpart E	40 CFR 59 Subpart E	
Adhesive							
Aerosol		75					
Mist Spray Adhesive	30	–	65	65	**30**	**30**	65
Web Spray Adhesive	40	–	55	55	**40**	**40**	55
Special Purpose Spray Adhesive							
Automotive Headliner Adhesive	65	–	65	65	65	65	65
Automotive Engine Compartment Adhesive	70	–	70	70	70	70	70
Flexible Vinyl Adhesive	70	–	70	70	70	70	70
Laminate Repair/Edgebanding Adhesive	60	–	60	60	60	60	60
Mounting Adhesive	70	–	70	70	70	70	70
Plastic Pipe Adhesive	60	–	–	–	–	–	–
Polyolefin Adhesive	60	–	60	60	60	60	60
Polystyrene Foam Adhesive	65	–	65	65	65	65	65
Screen Printing Adhesive	55	–	–	–	**55**	**55**	–
Acoustical Sealant	–	–	–	–	–	–	10 (Canada only
Construction, Panel, or Floor Covering	7	40	15	7	7	7	7
Contact	80	80	N/A	N/A	N/A	N/A	N/A
Contact – General Purpose	55	–	55	55	55	55	55
Contact – Special Purpose	80	–	80	80	80	80	80

Source: Household Consumer Products Association, 2024

Who do the rules typically apply to?

- Rules apply to any person who **sells, supplies, offers for sale, or manufactures regulated products**
  - Allows for an enforcement pathway if manufacturers abroad cannot be held accountable
  - Does not typically apply to products used in manufacturing and industrial settings

- CARB and OTC rules do not apply to products manufactured in-state but sold outside of the state

What would this mean for manufacturers?

Check if new regulations apply to company's products

Check if company has product versions that are compliant with new regulations

If products do not need reformulation

No further action is required except to comply with rule requirements to submit product formulation information upon request

If products need to be formulated

Determine which product/s need to be reformulated

Conduct R&D to develop reformulation/s

Ensure product labels meet labeling requirements

Ensure that products are not shipped for sale in states where they are non-compliant with regulations

What would this mean for vendors?

Check if new regulations apply to products sold by vendor (online or in stores)

Check if products sold are compliant with new regulations

If compliant

If not compliant

No further action is required; may be subject to product audits

Determine which product/s need to flagged for discontinued distribution

Request compliant versions of select products

Ensure that non-compliant products are sold out by date of sell-through provision, if applicable

RAC process and input

The rulemaking advisory committee (RAC) for this effort includes representatives from industry, local government, health/environmental advocacy groups, and community-based organizations.

- Four RAC meetings to-date
- Focus on background information, examining regulatory models and weighing benefits and drawbacks

Program components discussed with RAC input

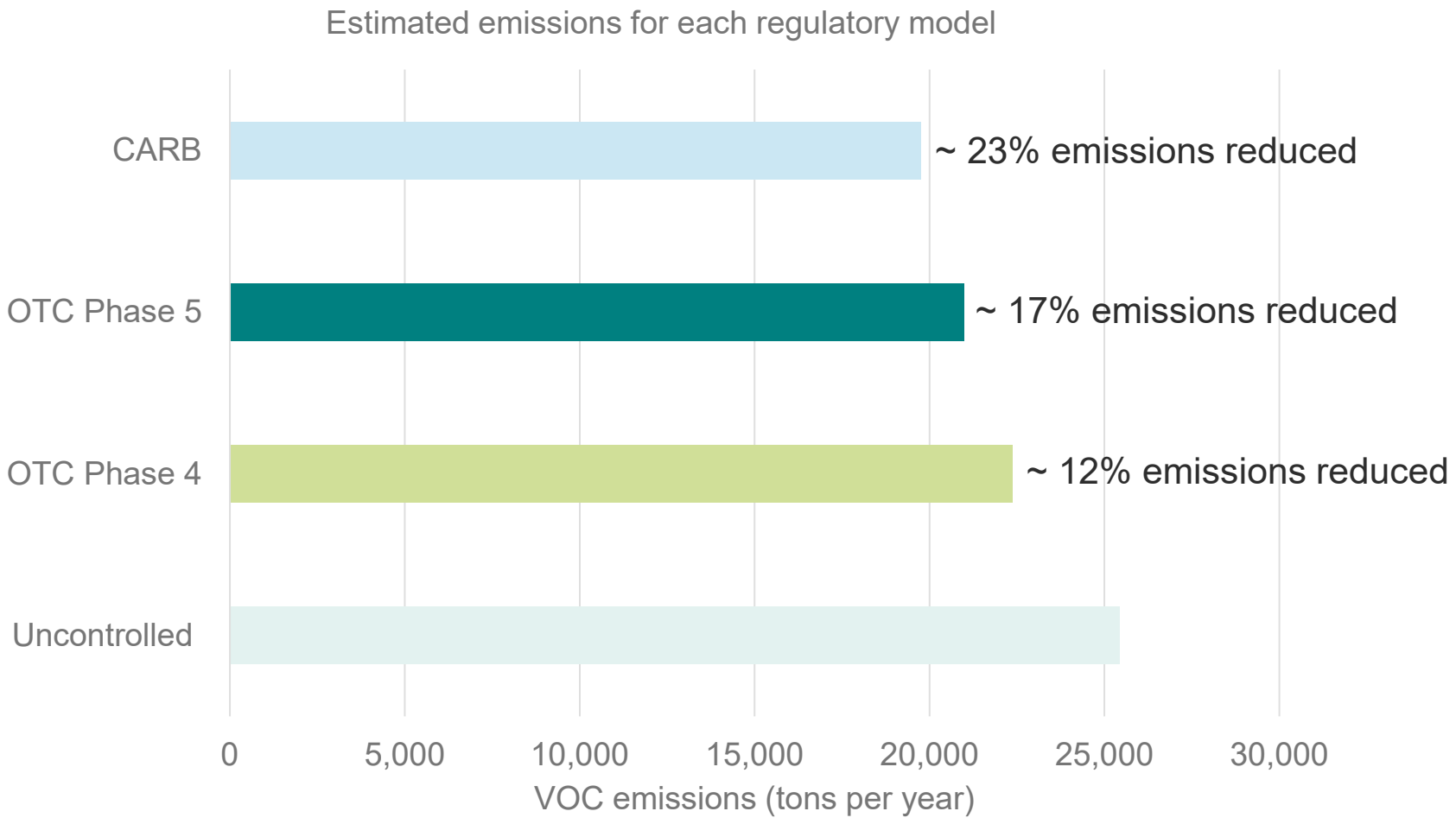
- CARB and OTC product **exemption structure and function**
- Exploring **additional Oregon-specific exemptions** for certain categories
- **Including restrictions on certain toxics** in regulatory models such as CARB/OTC

RAC discussions

Weighed benefits of different regulatory models and combinations

- **Using a model rule provides consistency** for industry and alignment with other states/jurisdictions
- **State-wide standards preferred**
- **Ways to minimize costs for both businesses and consumers** are important
- **Allowing ample time for Oregon manufacturers** that will need **to reformulate**

Emissions benefits



Why regulate consumer products and coatings?

Growing body of literature showing that as mobile source emissions have declined in the U.S., the relative importance of these products has grown in terms of impact on ozone production, particularly in cities

For example, the following research articles:

Observations confirm that volatile chemical products are a major source of petrochemical emissions in U.S. cities (Gkatzelis et al. 2021, DOI: 10.1021/acs.est.0c05471)

Volatile chemical product emissions enhance ozone and modulate urban chemistry (Coggon et al. 2021, DOI:118 (32) e2026653118)

Volatile chemical products emerging as largest petrochemical source of urban organic emissions (McDonald et al. 2019, DOI: 10.1126/science.aaq0524)

Regulatory pathways

OTC phase 4	OTC phase 5
Alignment with greater number of states (10)	More alignment with CARB standards
~12% estimated emissions reduction for VOCs	~17% estimated emissions reduction for VOCs
Less public health benefit for ozone reduction	Greater public health benefit for ozone reduction
Minimal reformulations necessary	Minimal reformulations necessary
Minimal distribution impacts	Modest distribution impacts
Minimal cost impacts for businesses/consumers	Modest cost impacts for businesses/consumers
Matches **2011** CARB rules	Matches **2015** CARB rules

Choosing a regulatory model

DEQ will support a recommendation to EQC for a regulation that can fit within current program scope and goals:

- ✓ Can be **implemented primarily with existing resources**
- ✓ Allows for **substantive emissions reductions**
- ✓ Provides some **policy alignment** with other air agencies in the region or the U.S.
- ✓ **Advances environmental justice**
- ✓ **Is not cost prohibitive** for the business community, particularly small businesses

Next steps ⏭

- **Finish rule drafting** based on model rules
- **Fiscal impacts** assessment
- Hold 1-2 more RAC meetings and **work with committee to discuss implementation**
- Hold **public comment** period
- Plan **to bring to EQC** as action item **in November 2025**

Title VI and alternative formats

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