State of Oregon
DEQ Department of Environmental Quality

Costs And Benefits Of Regulating Existing Air Contamination Sources Based On The Benchmark For Excess Noncancer Risk

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Executive Summary

In April 2018, then Governor Kate Brown signed Senate Bill 1541, which established provisions for Oregon's Toxic Air Contaminant program, called Cleaner Air Oregon. The bill defined the "benchmarks" for Excess Cancer and Noncancer Risks under the program, above which the Department of Environmental Quality could require an air contamination source to reduce risk. SB 1541 established these benchmarks for Excess Noncancer Risk using a Hazard Index, or HI. An HI is a calculation used to estimate noncancer health risks by comparing the level of exposure of the public to toxic air contaminants with the health-based standards for each of those contaminants – an HI is a ratio of these two concentrations. Toxicologists set these health-based standards for contaminants so that an HI equal to 1 means that at, or below that level, no negative health effects are expected. As an HI increases above 1, negative health effects can occur.

SB 1541 set differing benchmarks for new sources and for existing sources to be regulated under the CAO program. For new sources, the bill stipulated a benchmark equal to an HI of 1. Therefore, all new sources in the state must demonstrate that their emissions will not exceed the benchmark of an HI of 1 in order to receive a permit and begin operations.

In recognition that existing sources had been operating within previously permitted limits that did not account for Excess Noncancer Risk and could have difficulty meeting an HI of 1, the legislature established a benchmark for these sources at an HI of 5, or five times the Excess Noncancer Risk as compared to new sources. Based on the significant difference in these benchmarks, SB 1541 requires the DEQ to report to the Oregon Legislature, by no later than Sept. 15, 2026:

> "on the costs and benefits of regulating existing air contamination sources based on the benchmark for Excess Noncancer Risk as defined in section 2 of this 2018 Act and based on any adjusted benchmarks for Excess Noncancer Risk that have been applied to existing air contamination sources pursuant to section 7 of this 2018 Act. The report may include recommendations for legislation."

This report provides background on the establishment of the CAO program, including the program's rulemakings and implementation. The report details how the current benchmark for Excess Noncancer Risk affects the risk outcomes for existing sources and the corresponding regulatory impacts under the CAO program. The benchmarks established by the bill sunset in 2029 and are replaced with authority for the Environmental Quality Commission to establish a benchmark for existing facilities by rule.

To date, no existing source has exceeded the current benchmarks of 5 times the risk established pursuant to SB 1541. However, only a relatively small number of existing sources have fully completed the CAO process. The report concludes with the following recommendations:

1. **No changes or updates to the Excess Noncancer Risk benchmarks for existing sources are recommended currently.**

2. **DEQ continues to implement the CAO program with the current benchmarks and collect data from existing source risk assessments.**
3. **In 2029, when the provisions in SB 1541 for setting the Excess Noncancer Risk benchmarks for existing sources expire, DEQ should work with the Environmental Quality Commission to propose a permanent benchmark based on implementation data.**

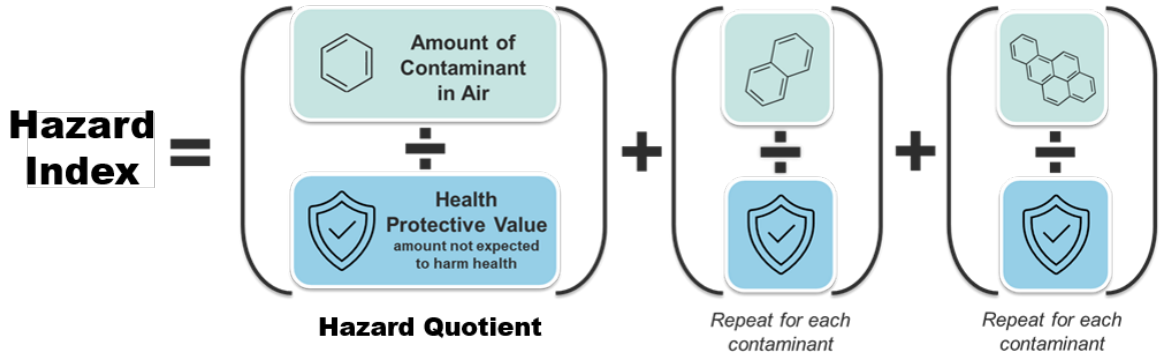
Introduction

Cleaner Air Oregon is a program that regulates emissions of toxic air contaminants from industrial and commercial air contamination sources based on risks to local health. CAO requires facilities to report toxic air contaminant emissions, assess potential health risks, and reduce those risks if the level of risk posed by the toxic air contaminant emissions exceed health-based standards. Sources are required to assess potential health risks to people living, working, or going to school nearby – these health risks may include cancer and noncancer health effects.

This report is required by Senate Bill 1541, adopted by the Oregon legislature on March 3, 2018. (A link to SB 1541 can be found on the Legislature's website, or by clicking here.) SB 1541 provided specific statutory authority to the Environmental Quality Commission and limitations for establishing a toxic air contaminant regulatory program for stationary air contamination sources operating in the state –Cleaner Air Oregon. SB 1541 established "benchmarks" for regulating both Excess Cancer and Noncancer Risk under this program. These benchmarks set the acceptable level of potential risk to the public above which DEQ can require a source to reduce risk through operational changes or installation of control technology, or both.

The bill set Excess Noncancer Risk benchmarks using a "Hazard Index number," or HI. Under SB 1541, an HI means "a number equal to the sum of the hazard quotients attributable to toxic air contaminants that have noncancer effects on the same target organs or organ systems." Where "hazard quotient" is defined as the calculated numerical value equal to the ratio of the air concentration of a toxic air contaminant to the noncancer risk-based concentration at which no serious adverse human health effects are expected to occur. In short, an HI equal to 1 means that at, or below that level, no negative health effects are expected. For more information on how Excess Noncancer Risks are calculated under the CAO program, see Figure 1 below and the CAO Fact Sheet on Noncancer Health Risk.

Figure 1. Calculating a Hazard Index number using hazard quotients.



The bill further provided differing benchmarks for both Excess Cancer and Noncancer Risk for new and existing sources under the CAO program. SB 1541 established an HI of 1 as the benchmark for new sources. This means that if the Excess Noncancer Risk for a new source

under the CAO program is determined to exceed an HI of 1, DEQ can require that source to reduce risk to a level at or below an HI of 1. The Environmental Quality Commission approved the use of the benchmark of an HI of 1 to also serve as the Excess Noncancer Risk level above which DEQ would deny a new source's permit application. Therefore, all new facilities in the state must demonstrate that their Excess Noncancer Risk will not exceed an HI of 1 in order to receive a permit and begin operations.

When setting the Excess Noncancer Risk benchmark for existing sources, the legislature took into consideration: (1) that existing sources were already constructed at the time the CAO program would be adopted; and (2) that these sources had been operating under a permitting program that did not regulate activities and emissions based on cancer and noncancer health risks. In recognition that existing sources could have difficulty meeting an Excess Noncancer Risk benchmark of 1, the legislature established the benchmark for existing sources at an HI of 5, or five times the risk for noncancer effects as new sources.

Recognizing the significant difference and potential public health risks at the higher benchmark for existing sources, the legislature provided authority to the Environmental Quality Commission to adjust this benchmark for specific toxic air contaminants. This process required DEQ to convene a technical advisory committee to establish criteria for determining which toxic air contaminants qualify for a benchmark adjustment and conduct a formal rulemaking for approval of any proposed adjustments by the Environmental Quality Commission.

SB 1541 sunsets the Excess Noncancer Risk benchmark for existing sources on January 1, 2029. After that date the Environmental Quality Commission has authority to establish the Excess Noncancer Risk benchmark for existing sources, through rule adoption.

SB 1541 requires DEQ to submit a report to the Legislative Assembly no later than September 15, 2026:

> "on the costs and benefits of regulating existing air contamination sources based on the benchmark for Excess Noncancer Risk as defined in section 2 of this 2018 Act and based on any adjusted benchmarks for Excess Noncancer Risk that have been applied to existing air contamination sources pursuant to section 7 of this 2018 Act. The report may include recommendations for legislation."

This report provides background on the CAO program, its implementation, including rulemakings related to the adjustments of the Excess Noncancer Risk benchmark, and findings from existing source risk assessments. The report provides a cost benefit analysis of regulating existing sources based on the current Excess Noncancer Risk benchmarks and concludes with recommendations for the legislature to consider as DEQ continues to implement the CAO program.

Background

Heavy Metals in Moss and the "HAP Gap"

In 2013, DEQ partnered with the US Forest Service to investigate high levels of heavy metals found in moss samples taken from trees throughout the city of Portland – this included arsenic, cadmium, chromium, and lead among other heavy metals. DEQ was able to confirm through ambient monitoring that smaller, art glass manufacturers were responsible for the elevated levels observed in the moss samples. The estimated exposure levels for some of the metals were an order of magnitude greater than the health-based "Ambient Benchmark Concentrations" established by DEQ for understanding potential health risks when interpreting ambient monitoring results. These values were developed for informational purposes only and were not regulatory benchmarks. At some locations close to the facilities, the assessed Excess Cancer Risk exceeded 50 per million – meaning at those levels of exposure DEQ would expect 50 incidences of cancer out of 1 million people over a lifetime of exposure. However, because the uncontrolled emissions were below federally established limits for Hazardous Air Pollutants, or HAPs, the facilities were operating lawfully under their air permits. This regulatory gap, where facilities could emit harmful levels of chemicals but remain below the existing federal standards, is known as the "HAP Gap."

When the findings were released, there was a public outcry for DEQ to regulate the heavy metal emissions from the facilities. Oregonians expressed concern that harmful levels of toxic air contaminants, or TACs, could be a threat to their and their family's health. This engagement prompted swift action by the Governor and the agency to ensure that the potential health effects from emissions from industrial and commercial sources are considered when setting limits in air quality permits.

Establishment of the CAO Program

In 2016, then Governor Kate Brown responded to the public concerns ordering DEQ and the Oregon Health Authority to establish the Cleaner Air Oregon program and address the HAP Gap. In June of that year, DEQ and OHA began comprehensive public engagement to develop program rules. Engagement included multiple public listening sessions around the state, technical advisory committee meetings, and policy forums. DEQ convened several Rulemaking Advisory Committee meetings from October 2016 to June 2017 to gather feedback and comments on the proposed program rules and their potential fiscal and economic impacts. The public comment period for the proposed rules was open from October 2017 to January 2018. This comprehensive public process took nearly two years.

While the agencies were reviewing and responding to the formal public comments, the Oregon Legislature passed Senate Bill 1541 (2018). SB 1541 authorized the Environmental Quality Commission to: "adopt a program and rules to reduce public health risks from emissions of toxic air contaminants from stationary industrial and commercial air contamination sources". The bill stipulated several significant provisions for the program, ranging from aspects of implementation to program fees. Importantly, and as noted above, SB 1541 set levels for Excess Cancer and Noncancer Risk above which DEQ could require that a source reduce risk to the public. These

levels were defined as “benchmarks” in the bill. Excess Noncancer Risk benchmarks are defined in the bill using a Hazard Index number, or HI, equal to a specified value.

SB 1541 provided separate benchmarks for existing sources compared to new or reconstructed air contaminant sources. Benchmarks for existing sources were set at higher levels of allowable risk as compared to new or reconstructed sources; the rationale of the legislature was that retrofitting an existing source with controls would likely be more expensive than building a new facility designed with controls and could have significant fiscal and economic impacts on existing sources. As noted previously, the legislature set the Excess Noncancer Risk benchmark for existing sources at five times the benchmark for new sources, at an HI of 5.

Passage of SB 1541 caused DEQ and OHA to revise the proposed program rules. In May 2018, DEQ re-convened the RAC to take comments on the revised rules and opened a second public comment period from June to August 2018. The agencies received significant public input on the revisions. Finally, in November 2018, DEQ presented the proposed CAO program rules to the EQC for consideration. The rules were adopted unanimously.

The CAO program is a state based regulatory program specific to Oregon that was promulgated to address the regulatory gaps uncovered by the Portland moss study and the subsequent DEQ monitoring confirming the heavy metal emissions from smaller art glass manufacturing facilities. This program has given DEQ the tools to issue air quality permits that meet health-based standards, ensuring a higher standard of public health protection than the pre-existing standards required under the federal Clean Air Act.

Rulemaking

Hazard Index

SB 1541 set the benchmarks for Excess Noncancer Risk using a “Hazard Index number”, or HI. In the bill, an HI is defined as “a number equal to the sum of the hazard quotients attributable to toxic air contaminants that have noncancer effects on the same target organs or organ systems”. Under the CAO program, the benchmarks set in SB 1541 are used to determine what actions, if any, are required to protect human health – these are called Risk Action Levels and can be found in OAR 340-245-8010 Table 1.

SB 1541 established an HI for existing sources five times higher than that for new sources. However, the bill also provided the Environmental Quality Commission with the authority to adjust the benchmark for Excess Noncancer Risk for toxic air contaminants emitted at existing sources that were expected to have:

(1) developmental human health effects associated with prenatal or postnatal exposure; and
(2) other severe human health effects.

In order to understand which TACs the Environmental Quality Commission could apply adjusted benchmarks to the bill required DEQ to convene a technical advisory committee to establish standards and criteria based on the language in the bill. SB 1541 also set the lower limit of adjustment permitted for the Excess Noncancer Risk benchmark for existing sources, allowing a

maximum reduction from an HI of 5 to an HI of 3. Ultimately, the process for adjusting the existing source benchmarks required formal rulemaking.

In 2019, DEQ and OHA initiated the "Cleaner Air Oregon Hazard Index Rulemaking." The agencies convened an Air Sciences Technical Advisory Committee, or ATSAC, to determine the criteria for adjusting a TAC's benchmark. This required analyzing toxicological information and defining "severe human health effects" in the context of TACs. DEQ re-convened the RAC from the original rulemaking to provide input and feedback on the proposed Hazard Index rules. Based on the feedback from both the ATSAC and the RAC, the agencies proposed adjusting the benchmarks for individual TACs for:

1. TACs with developmental and/or reproductive health effects;
2. TACs that affect multiple target organ systems – for example, A TAC that affects both the nervous and respiratory systems; and
3. TACs that are listed on the under Hazard Classes 2.3 and 6.1 by the U.S. Department of Transportation.

At the time of the rulemaking, there were a total of 184 TACs with published benchmarks for Excess Noncancer Risk. DEQ and OHA proposed adjusting the benchmarks for 159 of these TACs from an HI of 5 to an HI of 3. The Environmental Quality Commission adopted the new values in March 2020. Currently in rule[1] there are 159 TACs with an Excess Noncancer benchmark HI of 3 (HI3) and 25 with an HI of 5 (HI5)[2].

Toxic Air Contaminant Review and Update

In 2021, DEQ and OHA began the rulemaking process to re-evaluate standards, otherwise referred to as Toxicity Reference Values, based on updates from authoritative sources, such as the EPA and United States Agency for Toxic Substances and Disease Registry, to ensure the program is keeping pace with the science of air toxics. The process began with the scientific review of a significant amount of toxicological information from authoritative sources to determine what updates and revisions should be proposed to the TRVs. DEQ convened a new ATSAC, to provide feedback on the scientific review process and the proposed TRVs. DEQ is proposing to add 105 additional toxic air contaminants that have TRVs for Excess Noncancer Risk. When determining which Excess Noncancer Risk benchmarks could be adjusted, the agency relied on the criteria established during the Hazard Index rulemaking. Based on these criteria, DEQ is proposing to add 86 HI3 TACs and 19 HI5 TACs. DEQ convened a new RAC in 2025, to gather feedback on the proposed rules. RAC meetings are anticipated to conclude in October 2026 after the fifth meeting. After that, DEQ and OHA will review feedback from RAC members. DEQ will then finalize the proposed rules for public notice and anticipates taking these rules before the EQC in summer 2027 for proposed adoption.

[1] [OAR 340-245-8010 Table 2]
[2] HI3 toxic air contaminants are those with benchmark adjustments to an HI of 3; similarly, HI5 contaminants are those whose benchmarks were not adjusted from an HI of 5.

Cleaner Air Oregon Program Implementation

The CAO program requires both new and existing sources to perform risk assessments to determine potential Excess Cancer and Noncancer Risks to their surrounding communities. The program defines new and existing sources in OAR 340-245-0020.

- “New source” means a source that:
  - Is not an existing source; or
  - Was an existing source that has moved to a new location that is not contiguous or adjacent to its original facility location on or after November 17, 2021, excluding existing sources permitted as portable sources.
- "Existing source” means a source that:
  - Commenced construction before November 16, 2018; or
  - Submitted all necessary applications to DEQ under OAR 340 divisions 210 or 216 before November 16, 2018, and all such applications were deemed complete by DEQ.

As noted, when the original CAO program rules were adopted in 2018, the benchmarks for Excess Cancer and Noncancer Risk established in SB 1541 were used as the basis for setting specific risk levels, that if exceeded, would require sources to take action to remain in compliance with the program – these are defined as Risk Action Levels, or RALs, and are shown in Tables 1 and 2 below for new and existing sources, respectively.

An important note on how both new and existing sources are permitted to calculate Excess Noncancer Risk is that under SB 1541 a “Hazard Index number”, or HI, is defined as:

> “a number equal to the sum of hazard quotients[3] attributable to toxic air contaminants that have noncancer effects on the same target organs or organ systems”

This means that when performing a risk assessment under the CAO program a source is allowed to calculate the Excess Noncancer Risk by target organ system – i.e., calculating the risk to the respiratory system, developmental and reproductive systems, or neurological systems independently. DEQ compares the highest Excess Noncancer Risk result against the RALs to determine what actions the source must take, if any, to reduce risk. Sources may waive this right under the program and elect to simply sum the Excess Noncancer Risk across all target organ systems to assess the final Excess Noncancer Risk that DEQ will use to determine needed actions.

This distinction is important because in some cases it can affect the outcome of the risk assessment. In cases where the Excess Noncancer Risk is attributable to TACs that affect multiple target organ systems, choosing to assess risk by individual target organ system can lead to a lower risk than if all the Excess Noncancer Risk affecting the different organ systems is simply summed and reported as a combined risk. However, if Excess Noncancer Risk is driven

[3] Under SB 1541 “Hazard quotient” means a calculated numerical value that is used to evaluate noncancer health risk from exposure to a single toxic air contaminant. The calculated numerical value is the ratio of the air concentration of a toxic air contaminant to the noncancer risk-based concentration at which no serious adverse human health effects are expected to occur.

primarily by health effects on a single target organ system, this level of resolution for calculating risk may not significantly reduce the final Excess Noncancer risk at a source. Sources are able to decide the costs and benefits of the different approaches.

Table 1. New Source Risk Action Levels

Risk Action Level	Excess Cancer Risk per Million	Noncancer Hazard Index
Aggregate TEU Level	0.5	0.1
Source Permit Level	0.5	0.5
Community Engagement Level	5	1
TLAER Level [4]	10	1
Permit Denial Level	25	1

For new sources the benchmarks for Excess Cancer and Noncancer Risk correspond to the "Toxics Lowest Achievable Emissions Rate", or TLAER, RAL - this level is set at an HI of 1 for Excess Noncancer Risk. Pursuant to SB 1541, this RAL is the level, that if exceeded, DEQ can require a source to reduce risk. The CAO program reviews and approves risk assessments submitted by new sources as part of the permit application process. To date, the program has reviewed and approved over 70 new source risk assessments. No new sources have exceeded an HI of 1 for either Chronic or Acute[5] Excess Noncancer Risk because the benchmark for Excess Noncancer Risk, at an HI of 1, serves as both the TLAER RAL and as the "Permit Denial" RAL.

Existing source risk assessments are considerably more resource-intensive for both the agency and the sources. Existing sources are generally much larger, more complex facilities, and often there is limited available emissions information that could be considered representative for a risk assessment, which leads to these assessments requiring much more staff time to approve.

The CAO program rules provide existing sources anywhere from 180 days to over a year to submit all the required information, depending on the level of complexity of the risk assessment. In addition, there is a significant amount of back-and-forth between the source and DEQ regarding technical information. DEQ may approve extension requests for sources to submit required materials. Extensions are typically granted when a source has demonstrated progress towards completing submittals. The prescribed timelines, protracted review process, and extensions can result in existing source assessments taking years to complete. It is important to note that the majority of this time is spent collaborating between the agency staff and the source's environmental staff and/or consultants, determining the most representative emissions information for the operations and activities at a source.

[4] The Toxics Lowest Achievable Emissions Rate RAL corresponds to the Excess Noncancer Risk benchmarks from SB 1541 for new sources under the CAO program.
[5] Chronic Noncancer Risk is assessed using an annual averaging period, while Acute Noncancer Risk is assessed using a 24-hour averaging period.

For existing sources, the “Toxics Best Achievable Control Technology”, or TBACT, RAL corresponds to the benchmarks stipulated under SB 1541 and refined by the Hazard Index Rulemaking. Existing sources can emit either HI3 or HI5 TACs, or a combination of both. In cases where a source emits both HI3 and HI5 TACs, the facility is required to calculate a weighted average of Excess Cancer Risk using a “Risk Determination Ratio”, and the benchmark for the RDR is set to 1. Table 2 provides these benchmarks, which illustrates that all three cases are set at the TBACT RAL.

Table 2. Existing Source Risk Action Levels

Risk Action Level	Excess Cancer Risk per Million	Noncancer Hazard Index
Aggregate TEU Level	2.5	0.1
Source Permit Level	5	0.5
Community Engagement Level	25	1
TBACT Level [6]	50	3[7] or 5[8] or RDR[9] = 1
Risk Reduction Level	200	10[Error! Bookmark not defined.] or 6[Error! Bookmark not defined.] or RDR[Error! Bookmark not defined.] = 2
Immediate Curtailment Level	500	20[Error! Bookmark not defined.] or 12[Error! Bookmark not defined.] or RDR[Error! Bookmark not defined.] = 4

SB 1541 established a process that allows existing sources to exceed the benchmarks established in the bill and continue to operate so long as the source meets certain requirements. When an existing source exceeds the benchmarks (set at the TBACT RAL) it must either install controls on all activities or otherwise reduce risk to, at or below, the benchmark. If an existing source has controls on all activities, it can operate up to but not exceed the Risk Reduction

[6] The Toxics Best Achievable Control Technology RAL corresponds to the Excess Noncancer Risk benchmarks from SB 1541 for existing sources under the CAO program.
[7] When all toxic air contaminants emitted by a source are identified as HI3 in OAR 340-247-8010 Table 2 and OAR 340-245-8010 Table 2.
[8] When all toxic air contaminants emitted by a source are identified as HI5 in OAR 340-247-8010 Table 2 and OAR 340-245-8010 Table 2.
[9] Risk Determination Ratio is used when a source emits both HI3 and HI5 toxic air contaminants and is calculated according to OAR 340-245-0200.

RAL. A source is not permitted to operate above the Risk Reduction RAL without adhering to an approved Risk Reduction Plan to reduce risk to, at or below, this RAL.

To date, the program has reviewed and approved 15 existing source risk assessments, with another 20 currently in progress. Out of these 35 sources, none has exceeded the benchmarks for Excess Noncancer Risk set at an HI of 5, established through SB 1541. The Excess Noncancer Risk results approved to date are shown in Table 3. Only four sources have Excess Noncancer Risk results of an HI equal to 2, and just a single source had Excess Noncancer Risk results with an HI equal to 3. The other 10 are all at an HI of 1 or lower. None of the existing source assessments opted to assess Excess Noncancer Risk by individual target organ systems – meaning, sources decided to aggregate risk.

Table 3. Excess Noncancer Risk Result for Existing Sources

Excess Noncancer Risk	Existing Sources
HI ≤ 1	10
HI = 2	4
HI = 3[10]	1

[10] This is the most restrictive Excess Noncancer Risk benchmark allowed under SB 1541.

Costs and Benefits

The costs and benefits of regulating existing sources based on the current Excess Noncancer Benchmarks are both simple and complex. Because no existing source has exceeded the benchmarks, either as established in SB 1541 or adjusted by the EQC, and been required to install controls or reduce production, the costs of regulating at the current benchmarks appear primarily related to the risk assessment and not the benchmark triggering action. However, DEQ is aware, through permit modification records, that a few existing sources took action to reduce their emissions of toxic air contaminants before being called in to perform a risk assessment under the CAO program. These modifications have included installation of new or improved air pollution control devices, enclosing operations to reduce fugitive emissions, and increasing their stack heights. Additionally, some of these sources have made material substitutions used in their processes, switching to less toxic alternatives. Because these changes were not prompted through regulatory action, DEQ is unable to determine the exact monetary cost or the underlying business case prompting these modifications. If the program and existing benchmarks prompt action on behalf of sources to reduce their risk levels, that is undoubtedly a benefit to the surrounding communities.

While estimating the fiscal and economic impacts of air pollution to Oregonians is challenging, the data is demonstratable. Air pollution costs the state millions per year, with individual Oregonians shouldering the majority of individual healthcare costs. People exposed to toxic air contaminants at sufficient concentrations and durations have an increased chance of experiencing serious health effects. Noncancer effects can include damage to the immune system, as well as neurological, reproductive (e.g., reduced fertility), developmental, respiratory and other health problems. Less exposure to toxic air contaminants should result in fewer premature deaths and illnesses. Lowering exposure contributes to longer lives, better quality of life, lower medical expenses, fewer work and school absences, and better worker productivity – all of which have a positive economic benefit to the general public.

It is difficult at this point to clearly define the benefits of regulating existing sources at the higher benchmarks as opposed to the lower new source benchmark of an HI of 1. Toxicologists have established that an HI of 1 is the level at which no negative health effects are expected. Above this HI level, the chances of negative health effects increase. Because there are differences between contaminants and organ systems they affect, it is challenging to determine how much negative health effects increase with a corresponding increase in the value of the HI for any given risk assessment result under the CAO program. A relatively small number of existing sources have completed the CAO process. That said, no existing source risk assessment results for Excess Noncancer Risk have exceeded an HI of 3, and a majority did not exceed an HI of 1. At this time there is no data to determine the cost or benefit of HI3 over HI5. Likewise, there is little data to suggest that an HI of 1 would be unattainable. This means that the primary benefit to the public of regulating existing sources at higher HI benchmarks has been to limit Excess Noncancer Risk to three times the level that scientists consider safe for exposure to the toxic air contaminants regulated under the program.

It is well understood that there is significant economic benefit from reducing exposure of the general public to air pollution by controlling emissions directly at the source. For example, according to the EPA's 2011 Second Prospective Report[11], on average, for every $1 spent on air pollution controls there is a $30 benefit to public health.

As the program continues to evaluate existing sources, it may yet become clear that the costs of increased noncancer risk suggest that existing sources should be held to a benchmark closer to that of new sources. DEQ will continue to collect data from existing source risk assessments to assess the appropriateness of the current Excess Noncancer Risk and continue to more fully develop a cost-benefit analysis for regulating existing sources at these benchmarks.

[11] https://www.epa.gov/clean-air-act-overview/benefits-and-costs-clean-air-act-1990-2020-second-prospective-study

Conclusion

The Cleaner Air Oregon program published its Five-Year report in 2025. That report detailed the program's origins and implementation. The report recognized that implementing new programs is not without opportunities for improvements. For new facilities the program has worked to synchronize the construction permitting process with Cleaner Air Oregon's risk assessment. The program has completed assessments for over 70 new facilities subject to the program. It provides technical assistance for small businesses, helping them move through the assessment process efficiently as the program absorbs the costs. The program continues to make progress on assessing existing facilities, which are more time consuming and complex. Around a dozen existing facilities have completed the process and another 20 are in progress. Risk assessments are highly detailed, technical, and require time and expertise to review and approve. The simplest level of review can last 258 days. More complex facilities can take an average of 570 days as staff balance an iterative process with the facilities. The program has developed significant programmatic resources including guidance and tools for regulated sources, as well as educational materials for the public. Through the program, the people of Oregon have gained critical information on emissions of toxic air contaminants at a level of detail not possible prior to program implementation.

Recommendations to the Legislature

A relatively small number of existing sources have completed the CAO process. Based on the current risk assessments obtained for existing sources under the CAO program, no existing source has exceeded the benchmarks for Excess Noncancer Risk established pursuant to SB 1541 or adjusted by the EQC. In all cases sources used the typically more conservative method of calculating Excess Noncancer Risk by summing risk across all target organ systems rather than by individual systems. While no sources exceeded an HI of 3, only five existing sources demonstrated risk above an HI of 1. As noted previously, a small number of existing sources took action to reduce their emissions of toxic air contaminants before performing a risk assessment. In these limited cases DEQ is unable to determine whether sources met the benchmarks because they proactively addressed their emissions or because their production activities would typically result in risk below 5 times what is considered safe. Based on this data, it appears that existing sources can comply with the current, established benchmarks established pursuant to SB 1541 without requiring the CAO program requiring installation of controls or reductions in production activities. The CAO program is unable to specifically identify any additional costs beyond the program fees and standard costs of compliance incurred by sources associated with the current benchmarks of 5 times the risk established pursuant to SB 1541 or with those adjusted to HI of 3 by the EQC. However, since only a relatively small number of existing sources have fully completed the CAO process DEQ provides the following recommendations to the legislature:

1. No changes or updates to the Excess Noncancer Risk benchmarks for existing sources are required at this time;
2. DEQ continues to implement the CAO program with the current benchmarks and collect data from existing source risk assessments; and

3. In 2029, when the provisions in SB 1541 for setting the Excess Noncancer Risk benchmarks for existing sources expire, DEQ should work with the Environmental Quality Commission to propose a permanent benchmark based on implementation data.