

Significant business impacts from the EPA's finalized amendments to air toxics regulations

Affecting synthetic organic chemical and polymer & resin manufacturing industries



Which federal rules were changed?

The U.S. Environmental Protection Agency (EPA) has issued their latest package of air emissions rules for organic chemical manufacturers and petroleum refiners with chemical production units. The amendments are designed to reduce emissions of hazardous air pollutants (HAP) beyond controls and monitoring programs already in place through existing rules and monitor the ambient concentrations of certain HAPs at the facility fenceline.

This group of rules is for major sources of HAP and certain types of emission sources that have been constructed or modified. The rule package includes 40 Code of Federal Regulations (CFR) 63, Subparts F, G, H and I, collectively known as the Hazardous Organic NESHAP, the “HON”, 40 CFR 63 Subparts U & W, Polymer and Resin Groups I and II and 40 CFR 60, Subparts VV, VVa, VVb, NNN, NNNa, RRR, RRRa, NSPS for the Synthetic Organic Chemical Manufacturing Industry or “SOCMI”. See [here](#) for the EPA's list of facilities potentially affected by the HON/SOCMI rules package.

As described in detail below, the HON/SOCMI rule package will have new capex and opex impacts on affected sources and may present risks associated with new compliance programs, particularly fenceline monitoring requirements. Please read on for more details on these challenges.



What are the major implications of the final rules, and what actions should affected sources consider implementing now?

The HON/SOCMI package brings affected sources up to the enhanced control and monitoring levels seen in other recent rulemakings for the refinery, ethylene and miscellaneous organic manufacturing sectors, including the elimination of startup, shutdown, malfunction and force majeure allowances, and prohibiting the bypass of control devices. While the EPA has made some changes between the proposed and final rules, the rule package still results in numerous monitoring and work practice requirements that will take significant investments of capex for controls and opex for additional labor resources.

Affected facilities should work to immediately evaluate the implications of the final rule package and plan for these costs in their annual capex, operations and environmental budgets.

The new rule package includes extensive new requirements relating to the ambient monitoring and subsequent reporting of certain HAP concentrations at the fenceline of affected facilities. Chemical companies should be aware that these fenceline monitoring data reports will be visible in the public domain and vulnerable to scrutiny. In addition to potentially triggering costs to mitigate fenceline impacts, in an era of social and environmental justice concerns the fenceline monitoring requirement may present a risk to public perception and increased scrutiny from intervenors on future plant improvements or expansions. While the rules package does provide 2 years to commence fenceline monitoring, this time will be needed to properly pilot the monitoring program, prepare for compliance and get a head start on risk mitigation.

Affected facilities should consider immediately conducting pilot testing of fenceline monitoring programs — to understand where hotspots are to better plan for and mitigate risks prior to these requirements becoming effective (~2 years after the final rule package is published in the Federal Register). The EPA has indicated that in some cases meeting the regulatory emission controls for particular affected source or sources may not be enough to meet their expectations of what is protective of the public at the fenceline.

Changes from the proposed rule that may be problematic include a 90-day monitoring deadline for existing neoprene production sources and setting two chloroprene fenceline monitoring action levels, depending on whether one has HON or Subpart U affected sources.

What are the primary technical details on the revised and new requirements in the final rules and what are some actions business leaders can take in preparation of compliance?

The following are the primary aspects of the new rules package:

New requirements for sources in ethylene oxide (EtO) service – the final rules establish a low threshold for equipment to be considered in EtO service, stringent control requirements, limit the routing of EtO to a flare (but did not finalize proposed flare caps), set a lower leak rate definition and prohibit bypass of control devices.

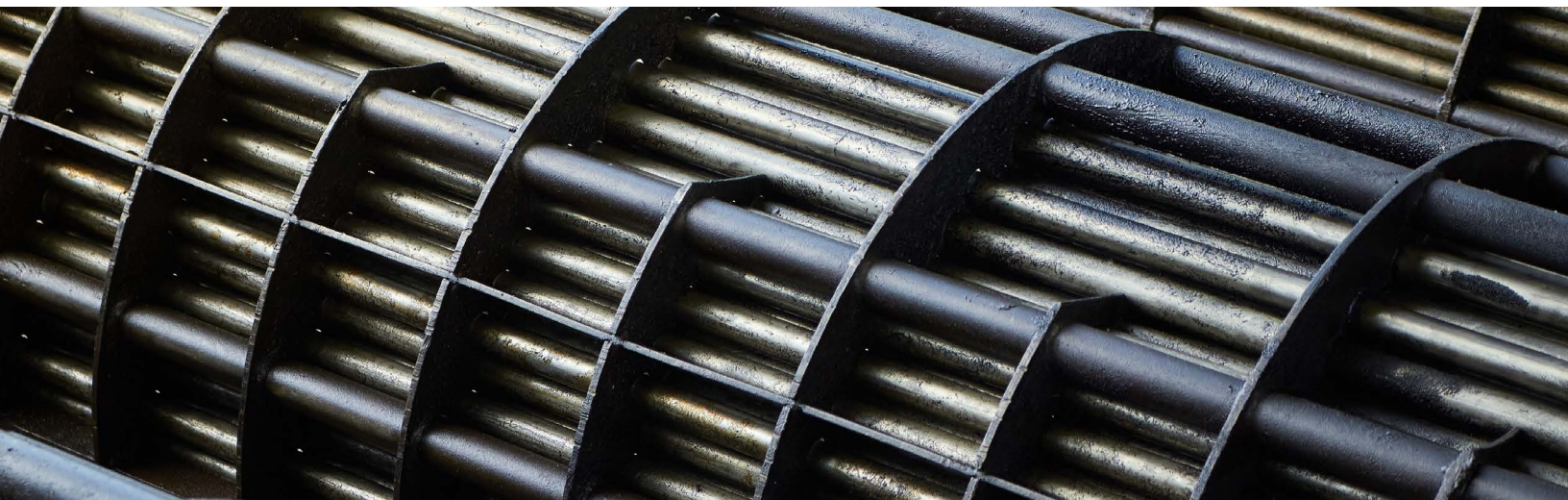
Control of process vents – The new rule package requires controls from process vents based on a 1 lb/hr HAP emission rate threshold, rather than thresholds based on concentration and flow from the previous NESHAPS. The “total resource effectiveness” concept was also removed from the new rules package. Stringent dioxan/furan standards were also added, and bypass of control devices at any time is prohibited in the new rules.

New practices for pressure relief devices – if vented to atmosphere, requirements for root cause analysis, notification of relief and redundant measures to prevent releases; pressure relief devices routed to the flare system also must document the relief prevention measures in the flare management plan.

Flares – establishes flare work practices, including minimum net heating value and continuous flare monitoring and management plans. Note that these requirements may be slightly different than Consent Decree flare monitoring or work practice requirements.

Storage vessels – controls on vessels with internal floating roofs (IFRs) where a sweep, purge or inert blanket is used, if venting is continuous. Additional IFR deck fittings and change in referencing pressure vessels.

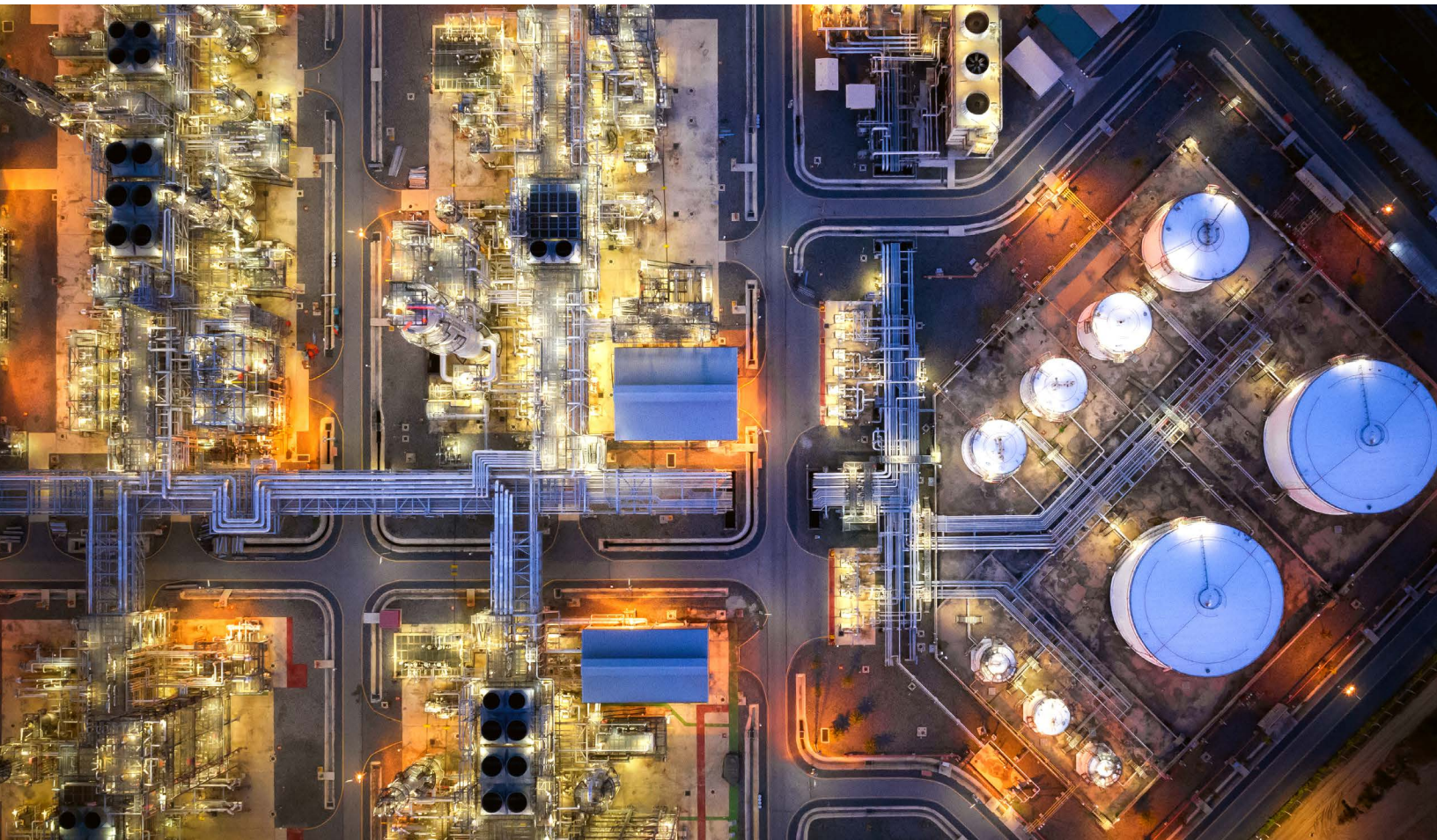
Heat exchange Systems – leak monitoring (Modified El Paso Method) on cooling water return, total strippable hydrocarbon concentration (parts per million as methane) in stripping gas, at representative riser or on heat exchanger lines. Wastewater cannot be injected into cooling water if it meets the HON definition of wastewater and if subject to EtO or chloroprene requirements if the water contains any amount of EtO or chloroprene.



Maintenance vents – prior to opening process equipment to the atmosphere, equipment must be drained and purged to a closed system (< 10 percent of the LEL; if LEL cannot be measured prior to opening, less than 5 pounds per square inch gauge). For installing and removing blinds, an alternative depressurization level of 2 psig is allowed at the point of purge gas entry. Release no more than 1.0 ton of chloroprene from all maintenance vents combined in any consecutive 12-month period; equipment served by the maintenance vent containing less than 50 pounds total volatile organic compound is not subject to the maintenance vent requirements.

To prepare for compliance as well as budget for capex/opex impacts, operators should take the following actions:

- Conduct or update a gap analysis and develop overall compliance strategy based on final requirements.
 - ◆ Capex implications – tank upgrades (fittings), instrumentation (PRVs), flare monitoring, potential equipment upgrades (if/as needed due to fenceline impacts)
 - ◆ Opex considerations – updated / expanded procedures for turnarounds, equipment shutdowns
 - ◆ Reputational and community relations risks – public fenceline monitoring data
- Understand potential risks - Complete fenceline monitoring pilot activities (more detail below)



Fenceline monitoring

The EPA used modeling of HON/SOCMI emissions to develop a list of target analytes and action levels that will prompt root cause analysis and additional mandatory real-time monitoring. In addition to passive tube monitoring for four analytes (similar to the Refinery MACT I monitoring for benzene), the EPA is adding evacuated canister sampling for two analytes.

The target analytes that facilities must monitor for include any that the affected source uses, produces, stores or emits.

Target analyte	Action level*, annual average basis	Fenceline method
Benzene	9 µg/m ³	Passive tube, 14-day sampling periods, Methods 325A/B
1,3-butadiene	3 µg/m ³	
Ethylene dichloride	4 µg/m ³	
Chloroprene**	0.8 µg/m ³ for HON 0.3 µg/m ³ for Subpart U sources	
Ethylene oxide	0.2 µg/m ³	Evacuated canister, 24-hr sampling period, every 5 calendar days, Method 327
Vinyl chloride	3 µg/m ³	

*ΔC values are calculated each round (highest value minus lowest value) and the rolling annual average (26 rounds for passive tube and 73 rounds for canister sampling) is calculated each sampling period.

** The EPA established two different action levels for Chloroprene based on affected sources.

Fenceline sampling results are required to be disclosed each quarter (via the Compliance and Emissions Data Reporting Interface (CEDRI)) and the EPA migrates the data to Webfire about 30 days after the upload to CEDRI. Data is publicly available and the reporting workbooks can be downloaded by anybody.

While it will take 1 year of sampling to officially exceed an action level, if the action level is exceeded, the root cause must be determined via additional monitoring. The root cause analysis must be completed within 45 days after determining the action level is exceeded and a corrective action plan may be required with additional actions needed until the annual average delta C is below the action level again.

To prepare for these new fenceline monitoring requirements and subsequent opex impacts and to get ahead of any potential risks associated with publicly available data, operators should take the following actions:

- Assess and plan for interaction with existing fenceline monitoring (e.g., a refinery with a HON affected emissions unit)
- Determine the number and spacing of the monitoring locations based on the size of the site, length of the perimeter and known sources within 50 meters of the perimeter.
- Establish / update sampling plan / SOP; assess value of preparing site-specific monitoring plans if off-site, as near field (neighboring facilities) may contribute to monitoring station results.
- Initiate an FLM pilot program that will enable:
 - ◆ Understanding of baseline performance vs. action levels
 - ◆ Development or update to procedures for addressing corrective actions.
 - ◆ Investigation/mitigation of any potential issues ahead of compliance timeline.

When are the new requirements effective?

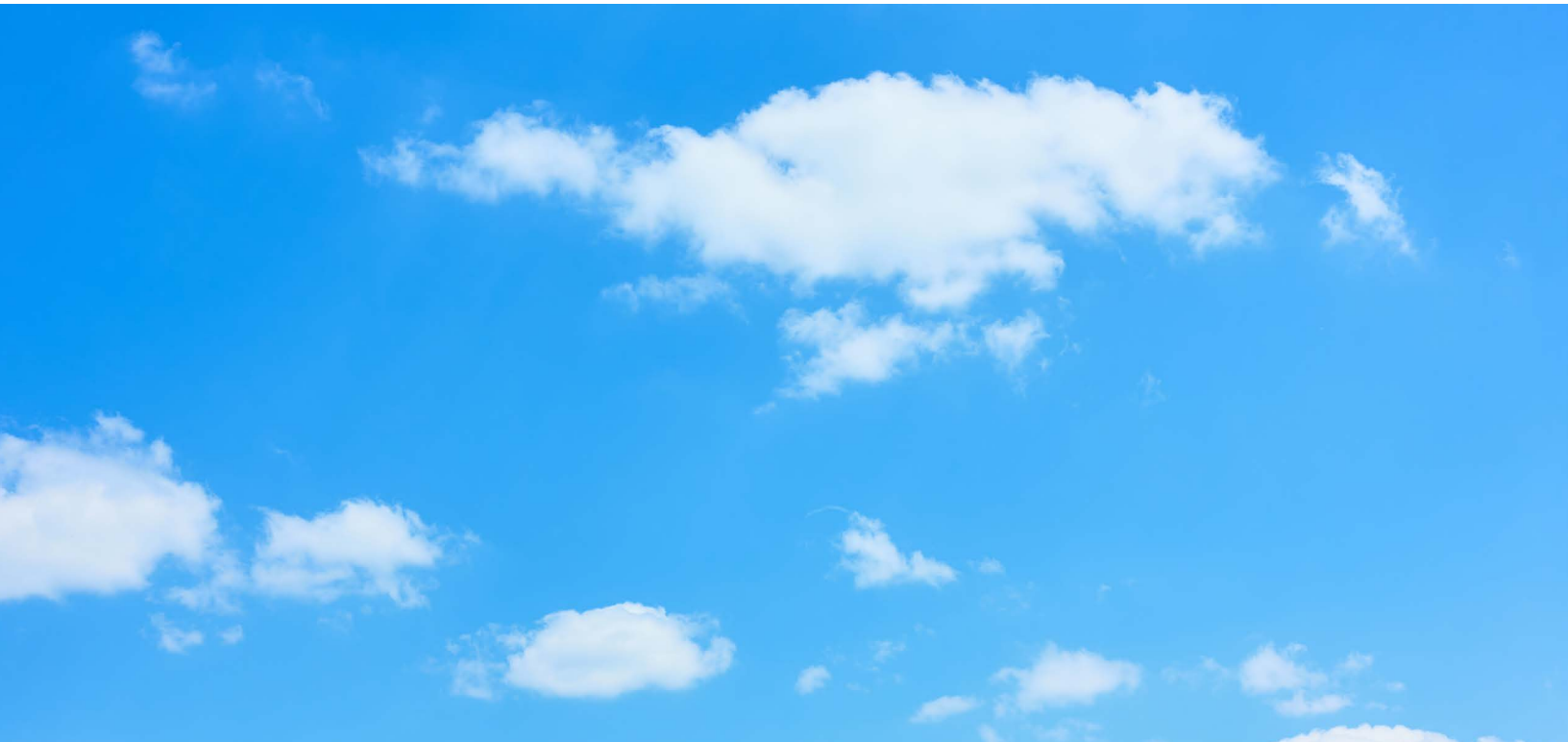
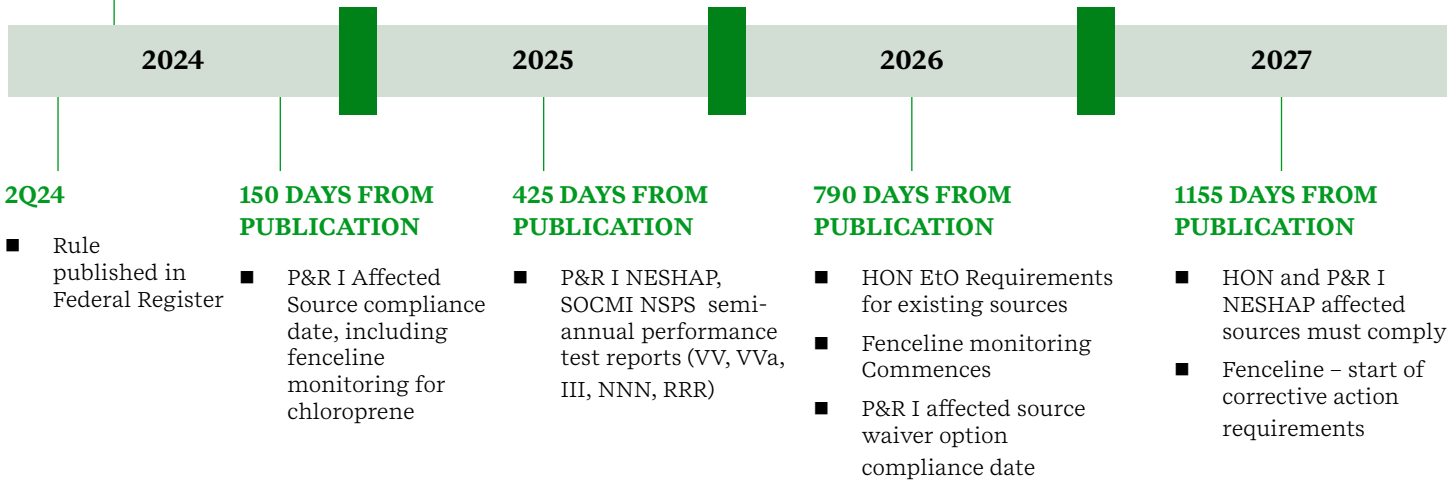
The timing of the various key requirements of the HON/SOC rules package are set relative to the publication of the final rules in the Federal Register. Publication is expected in the first quarter of 2024. The timeline below shows when the major requirements in the rules become effective.



Key compliance timelines

60 DAYS FROM PUBLICATION

- HON and P&R I NESHAP new affected source compliance Date (*constructed/reconstructed after 4/25/2023*)
- HON EtO new affected sources
- P&R I NESHAP, SOCM I NSPS (VVb, IIIa, NNNa, RRRa) with performance test reports (VV, VVa, III, NNN, RRR)



How ERM can help

ERM's air quality subject matter experts are ready to help your business prepare for the implementation of these new rules and to get ahead of the upcoming challenges and additional costs that future compliance will bring to your affected operations. The first set of preparations that sources can undertake is a **gap analysis evaluation of the new rules package, development of a compliance strategy** and eventual **revisions to your regulatory compliance programs**. This involves not only an accounting for the various affected components at your facility (pressure relief valves, tank fittings, etc.) but also an assessment of current monitoring and operating procedures (flare management, continuous parameter monitoring systems and more) that may need to be modified for future compliance. This assessment will allow your business to understand and prepare for future opex costs. Every affected facility will have its own unique challenges and solutions to future compliance, so these issues are critical for business leaders to understand as soon as possible.

The second critical step affected facilities should consider is a **pilot fenceline monitoring program**. As described in the details above, the data collected from these fenceline monitoring programs will be publicly available and greatly increase risks associated with public participation in future permitting. It will also be crucial to capex and opex planning at your facility to determine the scale and scope of the fenceline monitoring program as soon as possible, and use the ~2 year window before compliance monitoring begins to uncover and mitigate any potential fenceline hotspots.



About ERM

We are the world's largest pure play sustainability consultancy

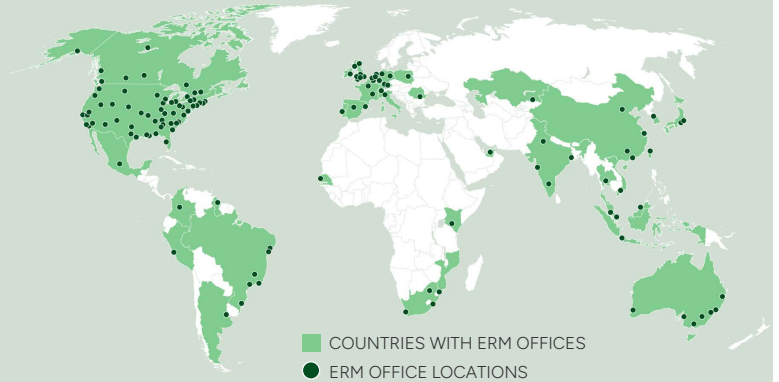
Founded in 1971, we are the largest advisory firm in the world focusing solely on sustainability, offering unparalleled depth and breadth of expertise.

We shape a sustainable future with the world's leading organizations

Our purpose guides everything we do. We create a better future by helping the world's biggest brands address today's sustainability imperatives.

We are the recognized market leader in sustainability services

Numerous industry benchmarks attest to our market leadership and the majority of our work is sole-sourced, reflecting trusted partnerships we build with our clients.



For more information, contact your current ERM consultant or any of our experts:

Andrew Woerner

Partner
+1 (484) 913-0455
andrew.woerner@erm.com
Philadelphia, PA - USA



Tom Wickstrom

Partner, North America Air Quality
Technical Community Lead
+1 (484) 913-0453
tom.wickstrom@erm.com
Philadelphia, PA - USA



John Gibbons

Partner
+1 (414) 977-4701
john.gibbons@erm.com
Milwaukee, WI - USA



Pat Sorensen

Technical Consulting Director
+1 (317) 706-2007
pat.sorensen@erm.com
Indianapolis, IN - USA



Ramesh Narasimhan

Partner, Global Service Leader,
Sustainable Operations & Compliance
+1 (504) 846-9215
ramesh.narasimhan@erm.com
New Orleans, LA - USA



Anand Rathinasamy

Partner
+1 (832) 924-5402
anand.rathinasamy@erm.com
Houston, TX - USA

