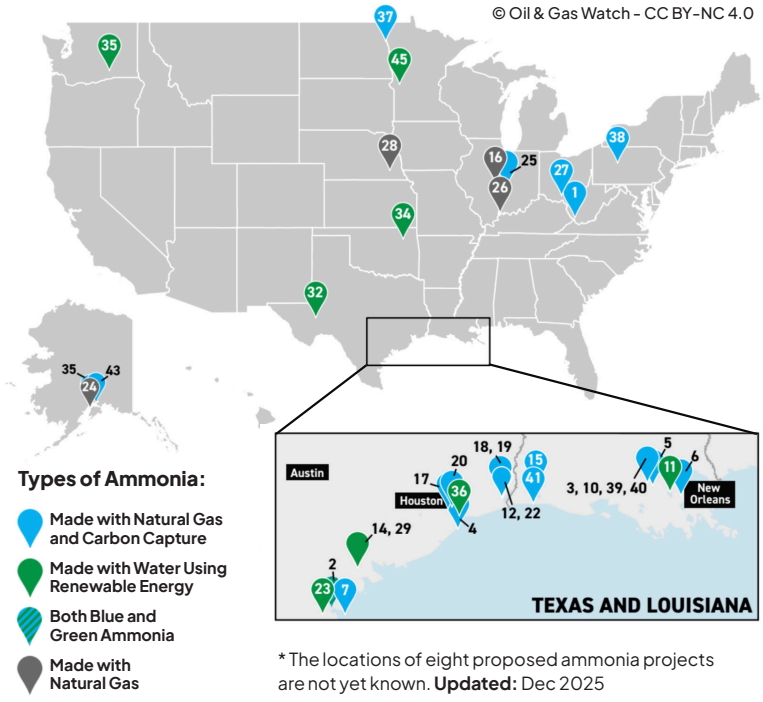
CIEL CENTER for INTERNATIONAL ENVIRONMENTAL LAW

Ammonia: Fossil Gas in a New Form

Fossil fuel and fertilizer companies are planning a massive expansion of fossil gas-based petrochemical facilities. At least forty-five ammonia facilities[1] have been proposed across the US — the majority are in Texas and Louisiana. If built, these projects could quadruple US ammonia production.[2]

Many of these facilities are marketed as 'low-carbon' or 'blue,' despite relying heavily on fossil fuels. Companies justify this greenwashing through plans to add carbon capture[3] and storage systems, even though these systems have a long history of failing to meet emissions reduction targets[4] while putting communities at elevated risk for pollution and related disasters. One example of additional risk is pipeline ruptures, which can release large quantities of hazardous carbon dioxide gas and cause suffocation and death.[5] Despite these concerns, carbon capture subsidies could be a trillion-dollar transfer of public funds to private industry.[6]

Location of Proposed Ammonia Projects



* The locations of eight proposed ammonia projects are not yet known. **Updated:** Dec 2025

Ammonia Buildout Could Quadruple US Ammonia Production

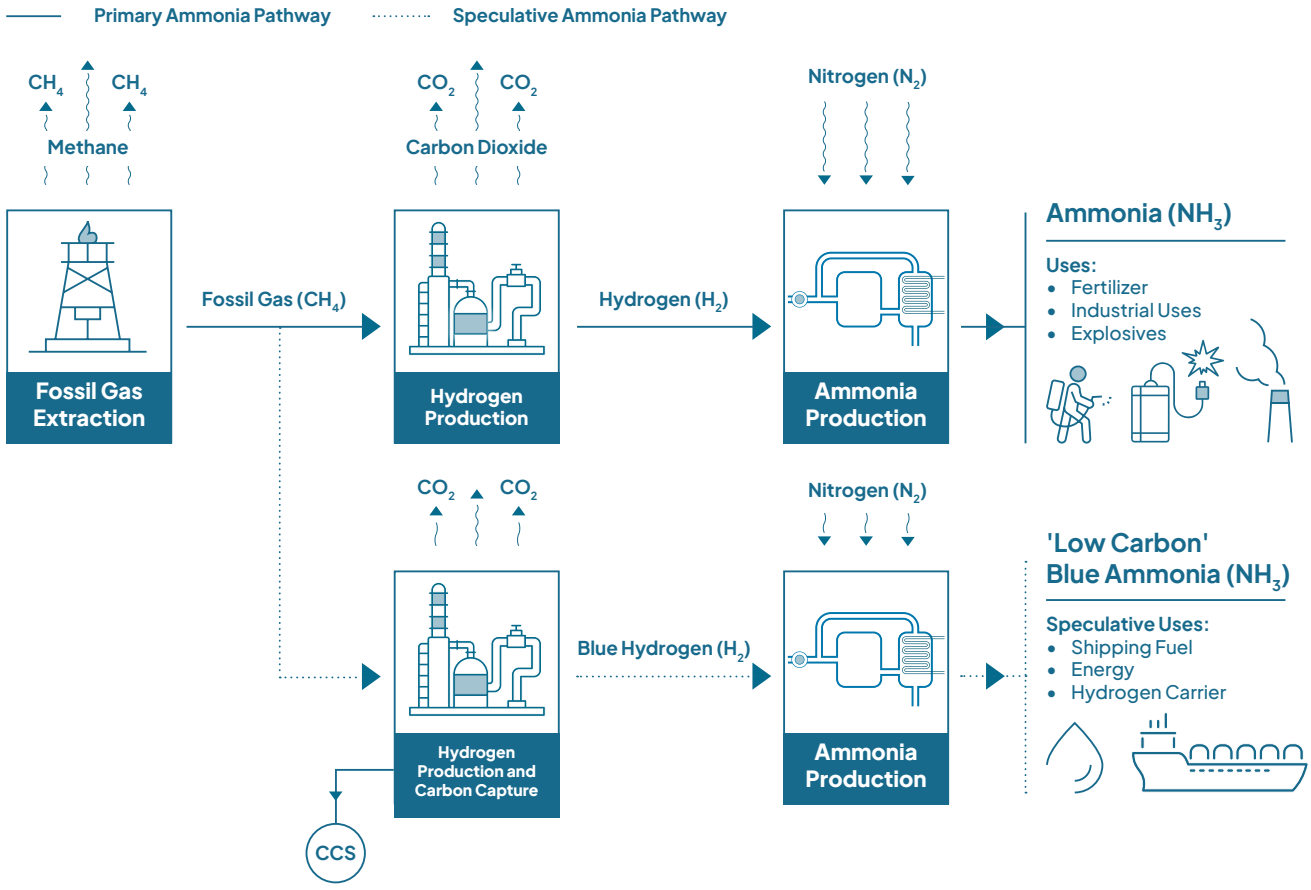
14 MMT — Estimated production levels as of 2020.[7] + **55.4** MMT — Estimated additional production capacity.[8] = **69.4** Combined Total MMT

*Each factory represents 1 Million Metric Tons (MMT).

What is Ammonia?

Ammonia (NH_3) is a toxic, colorless gas, known for its pungent smell — described as similar to urine or rotting fish.[9] Ammonia is made by separating hydrogen out of fossil gas (methane, CH_4) and bonding it to nitrogen from the air through an energy-intensive reaction.[10] Ammonia was first synthesized in the years leading up to World War I and has been used as both a fertilizer and an explosive.[11]

The Ammonia Production Process[12]



Today, the majority of ammonia is used for fertilizer production (around 70 percent),[13] but plans for the build out of ammonia production hinge almost entirely on speculative markets.[14] These markets include using ammonia as a shipping fuel, energy source, or hydrogen carrier, none of which are actually done at scale today,[15] even as these production facilities start to break ground.

Ammonia is Toxic and Can Be Deadly

Ammonia is on the US Occupational Safety and Health Administration (OSHA)'s List of Highly Hazardous Chemicals, Toxics and Reactives.[16] According to the list, the threshold quantity for ammonia to have the 'potential for a catastrophic event' is just 10,000 pounds (approximately 4.5 metric tons). Proposed ammonia facilities have plans to produce thousands of metric tons per day, massively increasing the threat of a catastrophe.[17] Project descriptions cite plans to export the 'low-carbon' ammonia to foreign markets,[18] effectively offshoring harm to US communities so other countries can purport to be carbon neutral.

Ammonia in Air

Dangers of Ammonia Gas

Ammonia is highly toxic and corrosive to skin. In high enough concentrations, ammonia can form difficult-to-disperse clouds of gas that stick to a person's eyes, mouth, lungs, throat, and skin.[19]

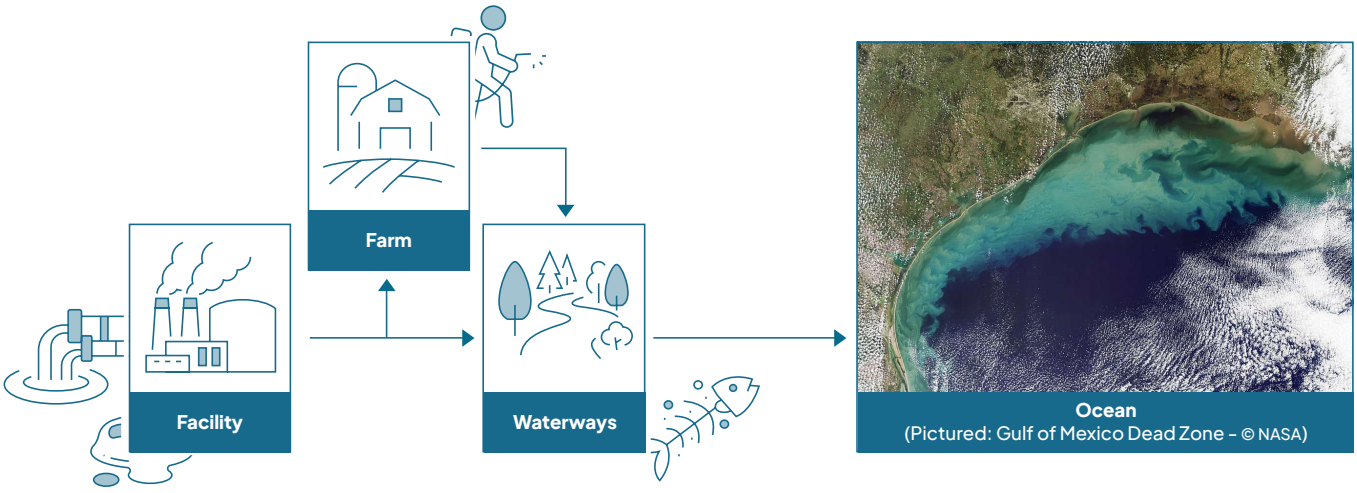
Obstruction to airways is generally the cause of immediate death in acute ammonia exposure, while chemical burns, infections, and other complications are the leading causes of death among those who survive days or weeks after exposure.[20] When released into the air, ammonia gas can react with other gases in the atmosphere to form PM 2.5,[21] an air pollutant estimated to cause millions of premature deaths per year[22] and also linked to asthma, respiratory illness, and cancers.[23] Though more research is needed on the health impacts on communities near fertilizer facilities, one study linked ammonia and other air pollutants from a fertilizer facility to higher incidences of acute respiratory diseases in children at a nearby school.[24]

Ammonia in Water

Companies are planning to ship more ammonia and even use it as a shipping fuel[25] despite it being highly toxic to aquatic life. According to a report by the Environmental Defense Fund, a large-scale spill of ammonia into rivers or the ocean would be more toxic to fish than a comparable quantity of marine gas oil.[26] Though more research is needed, this is already evidenced by existing impacts of ammonia pollution in waterways.

Ammonia Toxicity in Waterways

Nitrogen runoff from ammonia fertilizers can contaminate groundwater, trigger harmful algal blooms,[27] and even lead to dead zones — areas with little to no marine life.[28]



Ammonia fertilizers may also contribute to nitrate contamination in drinking water,[29] a known risk factor for infant methemoglobinemia, or "blue baby" syndrome, which can cause coma and death.[30] A growing body of research has also linked nitrate exposure to colorectal cancer, thyroid disease, and neural tube defects.[31]

Ammonia Spills and Catastrophes

There have been at least twenty-five big spills containing ammonia or derivatives reported to the US Government's National Response Center in just the last three years (2023-2025).[32] Ammonia releases have caused evacuations, shelter-in-place orders, injuries, and deaths. Between 2020 and 2024, existing plants released more than 119 million pounds of ammonia in Louisiana and more than 113 million pounds of ammonia in Texas.[33]

Examples of Recent Ammonia Spill Emergencies

Oklahoma, 2025:
A release from a tanker truck carrying 25,000 pounds of ammonia led to nearly 1,000 people evacuated, forty-five people hospitalized, and five first responders with chemical burns to their airways.[34]

Iowa, 2024:
A release from an ammonia fertilizer facility killed an estimated 800,000 fish along a sixty-mile stretch of rivers.[35]

Illinois, 2023:
A truck carrying 7,500 gallons of ammonia crashed, resulting in 500 people evacuated and five people killed from ammonia exposure.[36]

You Have the Right to a Healthy Environment

Ammonia is a dangerous, fossil-based chemical that is harming our environment and our communities. Our focus should be on phasing down the production and use of ammonia in all sectors, not creating new speculative markets for it. We need investments in fossil-free, community-powered energy and food systems — solar and wind energy and chemical-free, local food producers — not another wave of fossil fuel infrastructure. We deserve better and we have a recognized right to a healthy environment. Voted on by 161 countries in 2022, the United Nations affirmed that a safe and livable environment is not just sound policy — it is a fundamental and universal human right.[37]

CIEL CENTER for INTERNATIONAL ENVIRONMENTAL LAW

Website ciel.org

Instagram @ciel_org
Twitter @ciel_tweets
Linkedin linkedin.com/ciel.org

Endnotes

Endnotes

1. Oil and Gas Watch (OGW), *Fact Sheet: The Ammonia Buildout in the US* (OGW, 2025), https://cdn.prod.website-files.com/62963b843bd3a03f930371e2/694456354be551d3785df7de_OGW_Ammonia_Fact-Sheet_12.17.25_2.pdf.
2. Barnaby Pace and Steven Feit, *Emissions Unleashed: The Climate Crisis and America's Petrochemical Boom* (CIEL, 2024), 32, https://www.ciel.org/wp-content/uploads/2024/09/Emissioned-Unleashed_The-Climate-Crisis-and-Americas-Petrochemical-Boom.pdf.
3. Taylor Noakes, "Canada Oil Companies Delete Carbon Capture Mentions on Websites Before New Regulations Kick in," *Desmog*, July 3, 2024, https://www.desmog.com/2024/07/03/canada-competition-act-oil-companies-delete-carbon-capture-websites-new-regulations-pathways-alliance/.
4. Bruce Robertson and Milad Mousavian, *The Carbon Capture Crux: Lessons Learned* (IEEFA, 2022), https://ieefa.org/resources/carbon-capture-has-long-history-failure.
5. Anna Mattson, "Pipelines Touted as Carbon Capture Solution Spark Uncertainty and Opposition," *Scientific American*, October 1, 2023, https://www.scientificamerican.com/article/pipelines-touted-as-carbon-capture-solution-spark-uncertainty-and-opposition/.
6. Institute for Energy Economics and Financial Analysis (IEEFA), *Tax Credits for Carbon Capture Utilization and Storage (CCUS)* (IEEFA, 2025), https://ieefa.org/sites/default/files/2025-02/IEEFA%20CCUS%2045Q%20factsheet.pdf.
7. US Geological Survey, Mineral Commodity Summaries (US Geological Survey, 2021), 116, https://pubs.usgs.gov/periodicals/mcs2021/mcs2021.pdf.
8. Pace and Feit, Emissions Unleashed.
9. "Ammonia: Chemical Fact Sheet," Center for Disease Control (CDC), accessed March 9, 2026, https://www.cdc.gov/chemical-emergencies/chemical-fact-sheets/ammonia.html.
10. Sara Budinis et al., *Ammonia Technology Roadmap: Towards More Sustainable Nitrogen Fertiliser Production* (IEA, 2021), https://www.iea.org/reports/ammonia-technology-roadmap.
11. "Fritz Haber," Science History Institute Museum and Library, accessed March 9, 2026, https://www.sciencehistory.org/education/scientific-biographies/fritz-haber/.
12. "Primary Sources of Methane Emissions," US Environmental Protection Agency (EPA), accessed April 27, 2026, https://www.epa.gov/natural-gas-star-program/primary-sources-methane-emissions; The Royal Society, Ammonia: Zero-Carbon Fertiliser, Fuel and Energy Store (Royal Society, 2020), https://www.royalsociety.org/-/media/policy/projects/green-ammonia/green-ammonia-policy-briefing.pdf; Georgy Eliseev, "Ammonia Market Today and a Bridge to the Future," presentation at CERAWeek, Perth, Australia, June 17, 2025, https://ammoniaenergy.org/wp-content/uploads/2025/06/Georgy-Eliseev-APAC-2025.pdf
13. Budinis et al., *Ammonia Technology Roadmap*.
14. Eliseev, "Ammonia Market Today."
15. Eliseev, "Ammonia Market Today."
16. Data for *Appendix A to § 1910.119 - List of Highly Hazardous Chemicals, Toxics and Reactives (Mandatory)*, Occupational Safety and Health Administration (OSHA), accessed March 6, 2026, https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.119AppA.
17. OGW, *Fact Sheet: The Ammonia Buildout in the US*.
18. Pace and Feit, *Emissions Unleashed*, 32.
19. Agency for Toxic Substances and Disease Registry (US), "Health Effects" *Toxicological Profile for Ammonia* (Agency for Toxic Substances and Disease Registry, 2004), https://www.ncbi.nlm.nih.gov/books/NBK598714/.
20. Agency for Toxic Substances and Disease Registry (US), "Health Effects."
21. "Particulate Matter (PM) Basics," Environmental Protection Agency (EPA), accessed March 6, 2026, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics.
22. Baojing Gu et al., "Abating Ammonia Is More Cost-Effective than Nitrogen Oxides for Mitigating PM 2.5 Air Pollution," *Science* 374, no. 6568 (2021): 758-62, https://doi.org/10.1126/science.abf8623.
23. Yu-Fei Xing et al., "The Impact of PM2.5 on the Human Respiratory System," *Journal of Thoracic Disease* 8, no. 1 (2016): E69-74, https://doi.org/10.3978/j.issn.2072-1439.2016.01.19.
24. Milica Gomzi and Marko Šarić, "Respiratory Impairment Among Children Living in the Vicinity of a Fertilizer Plant," *International Archives of Occupational and Environmental Health* 70, (1997): 314-20, https://doi.org/10.1007/s004200050224.
25. Argus Media, *Argus White Paper: US Gulf Primed to Become Key Ammonia Export Region — How Important is a Fb Pricing Solution?* (Argus, 2024), https://view.argusmedia.com/rs/584-BUW-606/images/FER-Argus-WP-US-Gulf-primed-to-become-key-ammonia-export-region.pdf?version=1.

26. Lauren Dawson et al., *Ammonia as a Shipping Fuel: Impacts of Large Spill Scenarios* (Environmental Defense Fund, 2022), https://www.edfeurope.org/sites/default/files/EDF-Europe-Ammonia-at-sea-FullReport.pdf.
27. "Nitrogen and Water," US Geological Survey (USGS), accessed March 10, 2026, https://www.usgs.gov/water-science-school/science/nitrogen-and-water.
28. "What Is a Dead Zone?," National Oceanic and Atmospheric Administration (NOAA), accessed March 11, 2026, https://oceanservice.noaa.gov/facts/deadzone.html.
29. Mary Ward, "Drinking Water Nitrate and Human Health: An Updated Review," *International Journal of Environmental Research and Public Health* 15, no. 7 (2018): 1, https://doi.org/10.3390/ijerph15071557.
30. L. Knobeloch et al., "Blue Babies and Nitrate-Contaminated Well Water," *Environmental Health Perspectives* 108, no. 8 (2000): 675, https://pubmed.ncbi.nlm.nih.gov/10903623.
31. Ward, "Drinking Water Nitrate," 1.
32. "Map: Big Spills," SkyTruth Monitor, accessed January 27, 2026, https://monitor.skytruth.org/issue/big-spills.
33. Data for *Toxics Release Inventory (TRI) Explorer*, United States Environmental Protection Agency (EPA), accessed April 17, 2026, https://enviro.epa.gov/triexplorer/tri_release.chemical.
34. Meredith Deliso and Tristan Maglunog, "Dozens Hospitalized After Ammonia Leaks from Tanker Truck in Oklahoma Hotel Parking Lot," *ABC News*, November 13, 2025, https://abcnews.go.com/US/dozens-hospitalized-after-ammonia-leaks-tanker-truck-oklahoma/story?id=127501094.
35. Mitch Smith and Catrin Einhorn, "Iowa Fertilizer Spill Kills Nearly All Fish Across 60-Mile Stretch of Rivers," *New York Times*, March 29, 2024, https://www.nytimes.com/2024/03/29/us/iowa-spill-fish-kill.html.
36. Amy Simonson, "Five People Died from Ammonia Exposure After Illinois Crash, Coroner Says," CNN, October 3, 2023, https://www.cnn.com/2023/10/03/us/truck-crash-illinois-anhydrous-ammonia-deaths.
37. UN General Assembly, Resolution 76/300, United Nations Declaration on The Human Right to a Clean, Healthy and Sustainable Environment, A/RES/76/300 (August 1, 2022), https://docs.un.org/en/a/res/76/300.