

The Legalities of Privatizing Oxygen

Property, the Commons, and the Right to Breathe

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[Influenced by Claude, Fable 5.1]

Table of Contents

I. Introduction.....	3
II. Is Air Property? The Ancient Legal Answer.....	4
III. The Economics of a Genuinely Essential Good.....	5
IV. The Precedent That Already Exists: Medical Oxygen Markets.....	7
V. Stress-Testing the Market: India's 2021 Oxygen Crisis.....	8
VI. The Water Precedent: A Government That Privatized a Human Necessity.....	9
VII. The Human Right to Breathe: Building the Legal Counter-Argument.....	11
VIII. The Public Trust Doctrine: A Legal Tool Built for This Problem.....	12
IX. Common Heritage of Mankind: A Model From Outside Earth's Surface.....	14
X. The Essential Facilities Doctrine: Regulating an Unavoidable Monopoly.....	15
XI. Designing the Regime Nobody Has Actually Had to Build.....	16
XII. Why This Thought Experiment Is Not Entirely Hypothetical.....	18
XIII. Conclusion.....	19
Bibliography.....	20

I. Introduction

No government on Earth has ever tried to sell the atmosphere. This essay asks what the law would actually say if one did, not as idle speculation, but as a way of pressure-testing a genuine and increasingly relevant legal question: which necessities of life can be owned, sold, and withheld, and which ones the law treats as categorically incapable of becoming property at all. Air is the extreme case, and precisely because it is extreme, it exposes doctrines that are usually applied to less obvious goods, water, medicine, the electromagnetic spectrum, orbital slots, with unusual clarity.

The honest answer, developed across the sections that follow, is that nobody would need to invent a legal framework for privatized oxygen from scratch, because most of the relevant law already exists, built for adjacent problems: a two-thousand-year-old Roman category for things incapable of private ownership, a modern industrial market that already produces and sells oxygen at scale for medical and industrial use, a body of human rights law built around the right to health and, since 2022, an explicit right to a healthy environment, a public trust doctrine originally written for navigable rivers, and an antitrust concept, the essential facilities doctrine, designed for exactly the situation where a private company controls something everyone must use and cannot reasonably do without.

This essay proceeds by testing the hypothetical against each of those bodies of law in turn, then uses two real episodes, a genuine industrial-gas antitrust case and a genuine and lethal 2021 shortage of medical oxygen in India, as evidence for how something adjacent to full privatization actually behaves under stress. It closes by asking whether any government has, in fact, already begun pricing part of the atmosphere, and finds that the answer is a qualified yes, just not for the part we breathe.

A note on framing. Nothing in this essay should be read as a prediction that atmospheric oxygen will or should be privatized, and nothing here is legal advice. The premise is a thought experiment; the law and the historical episodes discussed to test it are real, and are cited to their sources throughout.

II. Is Air Property? The Ancient Legal Answer

A. *Res Communes*: Rome's Category for Things No One Can Own

Roman law, the ancestor of most European and Latin American property systems, did not treat all valuable things as potential objects of ownership. The Institutes of Justinian, compiled in the sixth century CE as an authoritative summary of Roman legal doctrine, opens its treatment of property by dividing things into several categories, and places air, running water, the sea, and the seashore into a category called *res communes*, things common to all by the law of nature, incapable of belonging to any individual precisely because their nature makes exclusive possession impossible or destructive of their basic character. This was not a moral or

political judgment about fairness; it was a technical legal conclusion about what kind of thing air actually is, reached independently of any modern human rights framework, more than a thousand years before anyone articulated a right to breathe as such.

The category has proven remarkably durable. Civil law jurisdictions descended from Roman law, including France, Spain, and most of Latin America, still retain some version of the *res communes* concept in their civil codes, typically listing air and the high seas as things that cannot be the object of private appropriation even though they can be used, and even regulated, by public authority. Common law systems, built on a different doctrinal foundation, reached a broadly similar practical result through the separate doctrines discussed in Parts VIII and IX below, but it is worth noting that the starting intuition, that air specifically does not fit the category of ownable things, predates every modern legal system currently in force.

It is worth being precise about what *res communes* was not. Roman law also recognized *res publicae*, things like navigable rivers and public ports, which belonged to the state and which the state could, in principle, manage, license, or restrict, and *res nullius*, ownerless things, wild animals, unoccupied land, that anyone could acquire simply by taking lawful possession of them. Air was deliberately placed in neither category. It was not treated as state property waiting to be administered, and it was not treated as an ownerless thing waiting to be claimed. It was placed in a category the Roman jurists considered permanently closed to appropriation by anyone, state or individual, which is a meaningfully stronger legal position than simply being currently unowned, and it is this stronger version of the doctrine that later public trust and common heritage frameworks, discussed in Parts VIII and IX, effectively inherited.

B. Airspace Law's Modern Compromise

Modern law complicates this ancient clarity in one specific respect: the space air occupies, as distinct from the air itself, has become a genuinely regulated and in some senses ownable resource. The old common law maxim *cuius est solum, eius est usque ad coelum*, whoever owns the soil owns up to the sky, once suggested that a landowner held unlimited rights to the airspace above their property. The arrival of powered flight made that maxim unworkable, and twentieth-century aviation law, beginning with the 1919 Paris Convention and consolidated in the 1944 Chicago Convention, replaced it with a regime in which states hold sovereign control over the airspace above their territory, airlines require specific rights of passage, and a landowner's airspace rights are generally limited to a lower zone necessary for the ordinary use and enjoyment of the land beneath it.

This distinction matters for the essay's central question because it shows a workable legal model for regulating access to a resource without converting the resource itself into private property: nobody owns the sky in the way they own a parcel of land, but the right to move through specific corridors of it is licensed, priced, and enforced with considerable precision. A

privatized-oxygen regime, this essay will argue in Part XI, would likely have to adopt something structurally similar, regulating access and use rather than attempting outright ownership of the substance itself, precisely because the airspace precedent shows that the second approach is administratively workable while the first, given air's physical behavior, is not.

The same regulatory logic has had to stretch again more recently, as low-altitude airspace fills with drones and, eventually, urban air mobility vehicles operating well below the corridors commercial aviation ever used. Civil aviation authorities, including the United States Federal Aviation Administration under its Part 107 framework, have responded not by declaring low-altitude air ownable, but by extending the same licensing logic downward, registration, operational ceilings, geofenced no-fly zones, rather than inventing a new property regime for the newly contested layer of sky. The pattern is consistent across nearly a century of airspace law: whenever a previously unregulated layer of the atmosphere becomes commercially or practically important, the legal response has been to license use of it more granularly, never to convert the air itself into a good that can be bought and sold outright.

III. The Economics of a Genuinely Essential Good

A. Public Goods, Common-Pool Resources, and Where Breathable Air Fits

Economists classify goods along two dimensions: whether one person's consumption reduces what is available to others, rivalry, and whether people can be prevented from consuming the good at all, excludability. A pure public good, like a lighthouse's beam or national defense, is both non-rival and non-excludable. Ambient breathable air, at the scale of the atmosphere as a whole, has historically behaved the same way: one person breathing does not meaningfully deplete the oxygen available to their neighbor, and there has never been a practical way to stop anyone from breathing the air around them.

The economic sleight of hand any privatization scheme would require is converting a good that is naturally non-excludable into one that is artificially excludable, precisely the transformation this essay's title imagines. That transformation is not unprecedented in economic history: fisheries, grazing land, and the electromagnetic spectrum have all, at different points, been converted from open-access common-pool resources into excludable property through licensing, quota systems, or enclosure, generally because unrestricted use was producing a tragedy of the commons, overfishing, overgrazing, or radio interference, that made some form of exclusion economically necessary. Ambient atmospheric oxygen currently exhibits no comparable depletion problem at the global scale (the atmosphere contains roughly 1.2 quadrillion tonnes of oxygen, replenished continuously by photosynthesis), which is precisely why no legal system has ever needed to develop an ownership regime for it, and why any hypothetical privatization would have to be justified by something other than the standard commons-tragedy logic that motivated fisheries and spectrum licensing.

Excludability, in each of the historical examples above, was manufactured rather than discovered: a toll booth makes a road excludable, encryption makes a cable broadcast excludable, a fishing license enforced by coast guard patrols makes a fishery excludable. None of those enforcement technologies transfer to ambient air at any plausible cost. There is no gate to install around a cubic meter of open atmosphere, no meter that can be attached to a person's lungs without their cooperation, and no patrol capable of preventing someone from inhaling the air already surrounding them. This is not merely a policy objection to privatizing ambient air; it is closer to a physical impossibility, which is precisely why every version of this thought experiment that survives contact with the underlying economics collapses, as the next section explains, into privatizing the processed product rather than the ambient resource.

B. What "Privatizing Oxygen" Would Actually Have to Mean

Because ambient air cannot, as a physical matter, be fenced, metered at the molecule level, or withheld from a particular person standing in open air, any realistic version of oxygen privatization could not mean owning the atmosphere itself. It would have to mean something narrower and considerably more familiar: privatizing the concentrated, purified, compressed, or delivered oxygen that already flows through a real industrial supply chain, hospital oxygen concentrators and cylinders, industrial gas pipelines, life-support systems on submarines and spacecraft, at the point where it has been extracted from ambient air and turned into a discrete, transportable, excludable product. This reframing is not a dodge. It is the only version of the premise that is legally coherent, and, as the next several parts show, it is also the version that already exists, in a market structure worth examining closely for what it reveals about how a fuller privatization would likely behave.

A more extreme, closed-environment version of the hypothetical, sealing off a building, a city, or some other bounded space and controlling all atmospheric access within it, is occasionally raised in popular discussion of this topic, usually drawing on science fiction rather than existing law. That version is worth setting aside explicitly: it is not really a claim about privatizing oxygen so much as a claim about privatizing an entire sealed environment, closer in legal character to owning a building than to owning a natural resource, and the extensive body of property, tenancy, and building-safety law that already governs enclosed structures would apply to it directly, without needing any of the specialized doctrines this essay examines. The genuinely hard and genuinely novel version of the question, the one this essay is built around, is what happens to the processed oxygen that already moves through open, ordinary commerce, not the considerably more mundane question of who controls the air inside a building they own.

IV. The Precedent That Already Exists: Medical Oxygen Markets

A. A Concentrated Industry: Linde, Air Liquide, and Air Products

The global industrial gas industry, which produces and distributes the compressed and liquefied oxygen used in hospitals, manufacturing, welding, and countless other applications, is dominated by a small number of firms: Linde plc, Air Liquide, and Air Products and Chemicals together account for a large majority of global industrial gas revenue, a concentration that intensified in October 2018 when Linde AG and Praxair, Inc. completed an approximately eighty billion dollar all-stock merger to form the current Linde plc, at the time the largest deal in the industry's history. This is, in a very real sense, oxygen already privatized in every sense that matters commercially: extracted from air through cryogenic distillation, owned by a private company from the moment of production, transported through owned pipeline networks or in owned pressurized cylinders, and sold under commercial contracts to hospitals, manufacturers, and distributors.

The supply chain sitting underneath that commercial relationship is worth describing concretely, because its structure explains much of what went wrong in Part V. Large cryogenic air separation units produce bulk liquid oxygen, which is then trucked in insulated tankers to hospital-site storage tanks, converted to gas, and piped to individual beds, a logistics chain with several distinct points of possible failure: production capacity, tanker and driver availability, road access, and on-site storage volume. A growing number of hospitals, particularly in the years following the 2021 shortages, have begun installing their own on-site pressure swing adsorption oxygen generation plants, which extract oxygen directly from ambient air at the point of use and reduce reliance on the trucked bulk supply chain entirely, a decentralization strategy that functions, in effect, as insurance against exactly the kind of systemic delivery failure examined next.

What this existing market demonstrates is that privatized, commercially supplied oxygen functions perfectly well as an ordinary industrial commodity under normal conditions, precisely because demand is stable, supply chains are mature, and competition, however limited, exists among a handful of large global suppliers. The interesting legal and economic questions, examined in the next two parts, arise not under normal conditions but under exactly the kind of acute, geographically concentrated demand spike that a genuine medical emergency produces, conditions under which the ordinary commercial market for a life-or-death good has already, once, visibly failed.

B. Antitrust Scrutiny of the Industrial Gas Oligopoly

Regulators have not treated this concentration as unremarkable. When Linde and Praxair sought approval for their 2017 merger, the United States Federal Trade Commission identified competitive concerns in nine separate relevant product markets, including bulk liquid oxygen,

and required Linde to divest a substantial package of assets as a condition of approval: all thirty-two of its United States merchant air separation units for bulk gases, sixteen carbon dioxide facilities, its excimer laser gas business, a North American liquid hydrogen production facility, and several hydrogen production and pipeline assets, with the divested bulk gas business sold to a joint venture between Messer Group and CVC Capital Partners, finalized alongside the underlying merger in October 2018. The European Commission separately required comparable divestitures to approve the merger in the European Union.

The regulatory logic here is directly relevant to this essay's premise: competition authorities treated concentrated control over bulk industrial oxygen production as a problem serious enough to require forced divestiture of specific physical production assets, not merely a theoretical concern to be monitored, precisely because a small number of firms controlling the bulk supply of a good hospitals and manufacturers cannot substitute away from creates exactly the kind of market power antitrust law exists to constrain. That this scrutiny already exists, for a good that is not formally recognized as uniquely essential in the way this essay's hypothetical treats oxygen, suggests that a genuinely monopolized oxygen supply would attract considerably more aggressive intervention than the Linde-Praxair merger did, not less.

V. Stress-Testing the Market: India's 2021 Oxygen Crisis

A. How a Medical Gas Became Scarce

In April and May 2021, during the second wave of the COVID-19 pandemic, India experienced a severe and widely documented shortage of medical oxygen, as hospitalization rates for a disease that frequently causes respiratory failure overwhelmed a supply chain that had never been built for that scale of simultaneous demand. India's industrial oxygen production capacity was, in aggregate, not insufficient for the country's medical needs, but the logistics of converting industrial-grade production into medical-grade oxygen delivered to the right hospitals in the right cities in the right timeframe broke down under the surge, producing severe localized shortages in Delhi and several other major cities even as, by some accounts, oxygen sat available elsewhere in the country. Hospitals ran out of oxygen with patients on ventilators and high-flow support still connected, and credible reporting from the period documented deaths directly attributable to oxygen exhaustion at specific hospitals, though the precise national death toll attributable to oxygen shortage specifically, as opposed to COVID-19 more broadly, was never definitively established and remains genuinely disputed.

The crisis arrived only four years after the World Health Organization had, on 7 June 2017, added oxygen to its Model List of Essential Medicines specifically for the treatment of hypoxemia, low blood oxygen, having previously listed it only for anesthetic use during surgery. That listing was itself a form of legal and administrative recognition, made by the same body that maintains the essential medicines framework many national governments use to set procurement priorities and price controls, that oxygen belongs in the narrow

category of goods too medically critical to be treated as an ordinary commodity, a designation that predates the India crisis and that would presumably attach with even greater force to any future scheme resembling privatization.

B. What the Courts Did When the Market Failed

The Indian judiciary intervened directly and with unusual urgency. The Delhi High Court held near-daily hearings through late April and early May 2021, at one point telling the central government to "beg, borrow or steal" oxygen for the capital's hospitals and warning that thousands of lives could be lost without immediate action, and separately threatening contempt proceedings against central government officials over supply shortfalls. The Supreme Court of India took up the matter through a *suo motu* proceeding, meaning the Court initiated the case on its own authority rather than waiting for a party to bring it, ordered the central government to submit a national oxygen allocation and distribution plan, and ultimately constituted a National Task Force of medical experts and administrators specifically to oversee equitable oxygen distribution across states based on need rather than existing commercial supply relationships.

The legal significance of this episode for the essay's central question is direct: when a market for a life-critical, already partially privatized good failed to allocate supply to where medical need was most acute, the response that actually occurred was not a call for more market mechanisms, private trading, price discovery, spot markets, but judicial intervention compelling government-directed, needs-based allocation, administered by a task force operating explicitly outside ordinary commercial channels. Whatever theoretical case might be made for market allocation of scarce medical oxygen in the abstract, the one large-scale real-world test of a genuine acute shortage produced, within days, a judicially mandated command-and-control response instead.

The executive branch reached for equally non-market tools. Indian authorities invoked provisions of the Disaster Management Act, 2005, to requisition industrial oxygen production capacity nationwide and redirect a large share of it toward medical use, effectively converting factories that had been supplying oxygen under ordinary commercial contracts into sources of centrally allocated emergency medical supply. That kind of emergency requisition power, a government compelling a private producer to redirect an essential good to government-determined priorities during a declared crisis, has close analogues elsewhere, including the United States Defense Production Act and comparable wartime and emergency statutes in most developed legal systems, and its use here reinforces the pattern already visible in the judicial response: acute scarcity in an essential good reliably pulls legal systems toward emergency executive and judicial control, away from ordinary market allocation, almost regardless of how that good was priced and supplied the day before the crisis began.

VI. The Water Precedent: What Happened the Last Time a Government Privatized a Human Necessity

A. Cochabamba, 2000

Oxygen has never been fully privatized at the point of consumption, but water, an equally essential and, at the individual level, similarly non-substitutable good, has been, and the most instructive case remains Bolivia's Cochabamba Water War. In 1999, under pressure from international lenders including the World Bank, Bolivia privatized Cochabamba's municipal water utility, awarding a forty-year, 2.5 billion dollar concession to Aguas del Tunari, a consortium led by a subsidiary of the American engineering firm Bechtel. Water rates rose sharply almost immediately, by an average of roughly 35 percent according to widely cited accounts, pushing monthly water bills to around twenty dollars in a city where many residents earned closer to one hundred dollars a month, a burden that in some households reportedly exceeded spending on food.

Sustained public protest culminated in early April 2000, when the Bolivian government declared a state of siege and security forces clashed with demonstrators; at least five people were killed and roughly 175 injured over the following days, and a widely circulated image of an army captain shooting a teenage protester helped turn the unrest into a national crisis. On 10 April 2000, facing the consortium's executives fleeing the city and the government's own security forces unable to contain the protests, Bolivia reversed the privatization entirely and repealed the underlying law. Aguas del Tunari subsequently filed a forty million dollar claim against Bolivia before the International Centre for Settlement of Investment Disputes, the World Bank's own investment arbitration body, a claim the parties settled in January 2006 with the investors formally withdrawing their financial demands.

B. The Lesson Water Privatization Actually Teaches

Cochabamba is frequently cited, somewhat imprecisely, as proof that privatizing any essential resource inevitably fails, but the more careful and more useful lesson is narrower: privatization of a literally indispensable, non-substitutable necessity, priced without regard to a population's actual ability to pay, and without any accompanying guarantee of a baseline free or low-cost allocation, generates a specific and predictable form of political and legal backlash intense enough to reverse the underlying transaction entirely, regardless of what the concession contract said. The parallel to a hypothetical oxygen privatization is close enough to be instructive rather than merely evocative: any pricing model that did not preserve free or heavily subsidized access to a baseline breathable supply would very likely provoke the same category of reaction, and considerably faster, given that a water shortage takes days to become lethal while an oxygen shortage takes minutes.

Cochabamba was also not an isolated data point. Bolivia's own capital region saw a second, related reversal in 2007, when the government terminated its concession with Aguas del

Illimani, a subsidiary of the French utility Suez, over water and sanitation service in La Paz and El Alto, citing failure to extend service to poorer outlying neighborhoods. Manila's water concessions and a series of contested water privatizations across Latin America and Southeast Asia through the 1990s and 2000s produced similar, if less dramatic, patterns of public backlash, contract renegotiation, or outright reversal. The recurrence across multiple countries, utilities, and decades suggests the Cochabamba dynamic is structural rather than a one-off failure of a single contract or a single company, which is precisely why it functions as a useful predictive model for a good, oxygen, that is even less substitutable than water.

VII. The Human Right to Breathe: Building the Legal Counter-Argument

A. The Right to Health and the Right to Life

International human rights law already supplies much of the doctrinal vocabulary a legal challenge to oxygen privatization would use. Article 12 of the International Covenant on Economic, Social and Cultural Rights, ratified by more than 170 states, recognizes the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, a right the treaty's supervising committee has interpreted as including access to essential medicines and to conditions necessary for basic physiological function. The right to life, protected in similarly near-universal terms under Article 6 of the International Covenant on Civil and Political Rights and in most national constitutions, has been interpreted by various domestic and regional courts to impose not merely a negative duty on states to refrain from killing but, in some readings, a positive duty to ensure the basic material conditions life depends on. A regime that allowed a private actor to withhold breathable air from a person able to pay a market price but unable to afford it would collide directly with both of these established doctrines, decades before any court would need to develop new legal theory specific to air.

Several national constitutions go further still, embedding an environmental right directly into domestic law rather than leaving the matter to international treaty interpretation. Section 24 of South Africa's post-apartheid Constitution guarantees everyone the right to an environment not harmful to their health or well-being, a provision South African courts have already applied in pollution and resource-access litigation, and Ecuador's 2008 Constitution went further still, granting enforceable constitutional rights directly to nature itself. Neither provision was written with airborne oxygen commerce specifically in mind, but both would be immediately available, as binding domestic constitutional law rather than merely persuasive international authority, to a litigant challenging a privatization scheme in either jurisdiction, and both illustrate that the legal architecture for resisting this essay's hypothetical already extends well beyond the international instruments discussed above.

B. The 2022 UN Resolution on a Healthy Environment

The legal terrain shifted further on 28 July 2022, when the United Nations General Assembly adopted Resolution 76/300, recognizing the right to a clean, healthy, and sustainable environment as a human right, by a vote of 161 in favor, none against, and eight abstentions, Belarus, Cambodia, China, Ethiopia, Iran, Kyrgyzstan, Russia, and Syria among the abstaining states. Then UN High Commissioner for Human Rights Michelle Bachelet welcomed the vote as recognition that all rights are connected to the health of the environment people live in. As a General Assembly resolution rather than a binding treaty, 76/300 does not itself create enforceable legal obligations, but resolutions of this kind have historically functioned as an important intermediate step, building the customary international law and domestic constitutional language that later translates into binding commitments, and several national constitutions and courts have already begun citing it. A clean and healthy atmosphere is about as direct an application of this new right as exists, which means any large-scale restriction on access to breathable air would now have to contend with an internationally recognized human right specifically on point, one that simply did not exist in this explicit form before 2022.

VIII. The Public Trust Doctrine: A Legal Tool Built for Exactly This Problem

A. Illinois Central and the Doctrine's American Roots

American law offers a homegrown doctrine that maps unusually well onto this essay's premise. In *Illinois Central Railroad Co. v. Illinois*, 146 U.S. 387 (1892), the United States Supreme Court held that the State of Illinois could not permanently convey the submerged lands beneath Lake Michigan's Chicago harbor to a private railroad, because the state held such lands in trust for the public, a trust it lacked the power to abdicate entirely regardless of what a prior legislature had purported to grant. The public trust doctrine the case established holds that certain resources, historically navigable waters, the seabed beneath them, and the wildlife they support, are held by government not as ordinary property it can freely sell, but as a trust asset it must manage for the continuing benefit of the public, a limitation on governmental power that private grantees cannot escape simply by having received a valid-looking deed.

The doctrine has expanded considerably since 1892, with courts in a number of American states extending it to groundwater, wildlife, and in some scholarly and litigated arguments, discussed next, the atmosphere itself. What makes *Illinois Central* specifically relevant here is that it establishes, as binding American constitutional law rather than mere policy preference, that some resources simply cannot be fully alienated into private hands regardless of legislative intent, precisely the legal conclusion a privatized-oxygen scheme would need to overcome.

The doctrine is not a uniquely American invention, either, which matters for a hypothetical this essay treats as a global rather than a purely domestic question. India's Supreme Court, in *M.C. Mehta v. Kamal Nath* (1997), explicitly imported public trust reasoning into Indian environmental law, holding that natural resources such as air, sea, waters, and forests have such a great importance to the people as a whole that it would be unjustified to make them a subject of private ownership, and using that reasoning to set aside a government lease that had diverted a riverbed for private commercial development. That an Indian court reached, independently and through its own constitutional jurisprudence, essentially the same doctrinal conclusion as the American *Illinois Central* line of cases suggests the underlying intuition is not a quirk of one legal tradition, but something closer to a recurring structural feature of how legal systems treat foundational natural resources generally.

B. Atmospheric Trust Litigation: Extending the Doctrine to the Sky

A sustained legal campaign, most visibly in the case *Juliana v. United States*, has argued that the public trust doctrine extends to the atmosphere itself, framing the federal government as a fiduciary trustee obligated to protect breathable air and a stable climate for present and future generations, and arguing that decades of federal fossil fuel policy breached that fiduciary duty and violated the plaintiffs' constitutional rights to life, liberty, and property. The *Juliana* litigation, brought by a group of young plaintiffs in 2015, worked its way through the federal courts for nearly a decade before the Ninth Circuit again dismissed the amended complaint for lack of standing in May 2024, and the Supreme Court declined to hear a further appeal in March 2025, effectively ending that specific lawsuit without the courts ever reaching a final decision on whether an atmospheric public trust actually exists as a matter of law.

The doctrine's ultimate fate in the United States therefore remains genuinely unsettled rather than resolved either way, but the theory itself, that a government-managed trust obligation already attaches to breathable air even in the absence of a final winning verdict, would be directly available to any future litigant challenging an actual attempt to privatize the atmosphere, in a much more legally straightforward posture than the *Juliana* plaintiffs faced: it is one thing to ask a court to compel affirmative climate policy from an unwilling government, which is what proved fatal to *Juliana*'s standing, and a considerably more tractable thing to ask a court to prevent a government from formally granting away trust property to a private party in the first place, exactly the posture that succeeded in *Illinois Central*.

IX. Common Heritage of Mankind: A Model From Outside Earth's Surface

A. The Deep Seabed and the Moon

International law has already built at least two working models for resources explicitly declared to belong to humanity collectively rather than to any state or private actor. Part XI of

the 1982 UN Convention on the Law of the Sea designates the deep seabed and its mineral resources beyond national jurisdiction, referred to simply as the Area, as the common heritage of mankind, providing that no state may claim or exercise sovereignty over any part of the Area or its resources, and establishing the International Seabed Authority to regulate any future mineral extraction on behalf of humanity as a whole, with proceeds intended to benefit all states, developing states in particular. The 1979 Moon Treaty, in considerably weaker form given its low ratification rate among spacefaring nations, applies similar common heritage language to the Moon and other celestial bodies in Article 11, declaring that neither the surface nor the subsurface may become the property of any state, organization, or individual.

B. Could the Atmosphere Be Declared a Common Heritage Zone?

The common heritage of mankind framework was designed for resources outside any state's existing sovereign territory, which is precisely where it runs into difficulty as a model for atmospheric oxygen: unlike the deep seabed or the Moon, the atmosphere directly overlies, and is legally entangled with, the territory of every state on Earth simultaneously, meaning any attempt to place it under common heritage management would require an unprecedented degree of coordinated sovereign concession, considerably harder to achieve than agreement over a seabed no state currently occupies. Even so, the doctrinal architecture, an international authority managing a resource explicitly held for humanity's collective benefit rather than for any single claimant, is directly transferable in principle, and several scholars and, following the 2015 Paris Agreement, treaty negotiators have informally invoked common-heritage-style language when discussing the atmosphere's capacity to absorb greenhouse gases, suggesting the doctrinal bridge between these frameworks and breathable air specifically is shorter than it might first appear.

A related, older model offers a third data point rather than a mere analogy. The Antarctic Treaty System, anchored by the 1959 Antarctic Treaty and its subsequent protocols, freezes all territorial claims to the continent, reserves it for peaceful and scientific use, and prohibits it from becoming the object of ordinary commercial exploitation, without formally invoking the common heritage of mankind language the seabed and Moon regimes later adopted. Legal scholars generally treat the Antarctic regime as a doctrinally distinct, earlier cousin of common heritage governance rather than a strict application of it, but its practical lesson is the same: international law has, on at least three separate occasions, seabed, celestial bodies, and an entire continent, built durable, working governance frameworks for resources or territory that ordinary domestic property law could not sensibly reach, which undercuts any argument that the atmosphere is somehow uniquely unsuited to comparable treatment.

X. The Essential Facilities Doctrine: Regulating a Monopoly You Cannot Avoid Using

A. When Antitrust Law Forces Access Instead of Blocking Mergers

Most antitrust law works by preventing or unwinding anticompetitive concentration before it forms, exactly the logic behind the divestitures imposed on the Linde-Praxair merger. A separate and more aggressive doctrine, the essential facilities doctrine, instead accepts that a monopoly over some facility already exists and asks whether the monopolist can be legally compelled to grant competitors, or in principle any user, access to it on reasonable terms, on the theory that some infrastructure is so foundational that excluding others from it causes harm no amount of after-the-fact competition elsewhere in the market can repair. American courts have applied versions of this reasoning to railroad terminals, telecommunications networks, and other infrastructure genuinely difficult to duplicate, though the doctrine's practical reach narrowed considerably after the Supreme Court's 2004 decision in *Verizon Communications Inc. v. Law Offices of Curtis V. Trinko, LLP*, 540 U.S. 398 (2004), which expressed considerable skepticism toward using antitrust law, as opposed to sector-specific regulation, to compel access to a monopolist's infrastructure, reasoning that forced sharing can itself blunt the incentive to build such infrastructure in the first place.

B. Applying It to a Hypothetical Atmospheric Utility

Trinko's skepticism notwithstanding, the essential facilities logic maps onto a privatized oxygen supply about as cleanly as it maps onto anything: breathable air delivery infrastructure would be, definitionally, something literally every person needs continuous access to and cannot substitute away from, the paradigm case the doctrine was designed to address, and Trinko's specific concern about blunting infrastructure investment incentives carries less force for a resource whose underlying supply, unlike a newly built telecommunications network, already exists freely in nature and merely requires processing and distribution. The likelier outcome, consistent with Trinko's own preference for sector-specific regulation over ad hoc antitrust remedies, is that a real privatized-oxygen industry would end up governed the way electricity, water utilities, and natural gas distribution already are in most developed economies: not as an ordinary competitive market at all, but as a regulated public utility, with government-set rates, mandated universal service obligations, and price controls specifically designed to prevent the exercise of exactly the kind of market power an essential, non-substitutable good would otherwise command.

The specific regulatory mechanics of that outcome are already well established in adjacent utility sectors and would transfer with little modification. Utility regulators typically choose between rate-of-return regulation, which sets prices to allow a regulated monopoly a specified return on its invested capital, and price-cap regulation, which fixes an allowable price path in advance and lets the utility keep efficiency gains, each with well-understood

tradeoffs between investment incentives and consumer protection that regulatory economists have studied across a century of electricity and telecommunications regulation. Layered on top of either mechanism, most jurisdictions also impose lifeline or baseline tariffs, a legally guaranteed minimum quantity of the regulated good priced far below the standard commercial rate or provided free, specifically to prevent the poorest households from being priced out of electricity or water entirely. A hypothetical oxygen utility regulator would not need to invent this architecture; it would simply need to adopt it.

XI. Designing the Regime Nobody Has Actually Had to Build

A. Three Models: Rationed Property, Regulated Utility, Commons Trust

Drawing together the doctrines examined so far, three broad regulatory models emerge for how a legal system could plausibly govern a genuinely privatized oxygen supply. A rationed property model would treat processed, deliverable oxygen as ordinary private property, subject to ordinary contract and sale, but would layer on a mandatory baseline entitlement, a legally guaranteed minimum free or low-cost allocation sufficient for survival, similar in structure to the lifeline utility rates many jurisdictions already require for electricity and water to prevent literal deprivation of low-income households. A regulated utility model, following the essential facilities logic from Part X, would keep production and distribution in private hands but subject pricing, service obligations, and market entry to a dedicated regulator, much as electricity and piped water are governed today. A commons trust model would reject private ownership of the resource itself entirely, consistent with the *res communes* and public trust doctrines from Parts II and VIII, permitting private firms to charge for processing, compression, and delivery services, exactly as the existing industrial gas industry already does, while holding that the underlying atmospheric resource itself remains legally inalienable, incapable of being owned regardless of what any contract purports to transfer.

B. Why Every Serious Model Converges on Heavy Regulation, Not a Free Market

What is notable across all three models, and consistent with every real-world precedent this essay has examined, the Linde-Praxair divestitures, India's judicially mandated allocation, Cochabamba's reversal, is that none of them resembles an unregulated free market in the ordinary commercial sense. Every serious legal framework capable of governing a good this essential converges on some combination of mandatory baseline access, price regulation, and either public ownership or public trusteeship of the underlying resource, differing mainly in how much room they leave for private commercial activity at the margins, processing, compression, delivery logistics, rather than over whether unrestricted market pricing of the core resource itself would be legally or politically sustainable. That convergence is itself a fairly strong answer to the essay's title question: the law does not actually lack the tools to address privatized oxygen because the concept is unthinkable; it has simply never needed to

build a bespoke framework, because every adjacent case it has already handled points toward the same conclusion.

One practical obstacle deserves acknowledgment rather than glossing over, because it sets a genuine limit on how far any of these three models could actually be implemented: metering. Electricity and piped water are measurable at the household level through infrastructure, wires and pipes, that are already physically excludable, which is what makes lifeline tariffs and lawful disconnection for non-payment administratively enforceable in the first place. Ambient air has no equivalent chokepoint; only air that has already been compressed, bottled, or piped into a sealed system, a hospital ward, a submarine, a spacecraft, can be metered at all. This is not a flaw in the three models above so much as a confirmation of the boundary Part III.B already identified: every workable regulatory regime this essay has described applies to processed, delivered oxygen, precisely because that is the only form of the resource physics allows anyone to exclude anyone else from.

XII. Why This Thought Experiment Is Not Entirely Hypothetical

A. Carbon Markets: We Already Price the Atmosphere, Just Not Its Oxygen

It would be a mistake to treat atmospheric pricing as purely science fiction, because a version of it already operates at global scale, aimed at a different atmospheric constituent. Cap-and-trade carbon markets, operating in the European Union, California, China, and a growing number of other jurisdictions, assign a tradable price to the right to emit carbon dioxide into the atmosphere, effectively treating the atmosphere's limited capacity to absorb greenhouse gases without triggering dangerous warming as a scarce, allocable, and priced resource, administered through government-issued permits rather than outright private ownership. This is, functionally, a common-pool resource management scheme very close in structure to the regulated-utility and commons-trust models described in Part XI, applied not to the oxygen we breathe but to the atmosphere's absorptive capacity for a different gas, and it demonstrates that governments already possess, and routinely exercise, the legal and administrative machinery needed to price and allocate access to a shared atmospheric resource when they judge it necessary.

The European Union Emissions Trading System, launched in 2005 as the first major cap-and-trade scheme of its kind, is instructive precisely because of how much its allowance price has moved over two decades, from a few euros per tonne during its early oversupplied years to figures many multiples higher after successive reforms tightened the cap, a volatility that illustrates both the strengths and the real risks of treating an atmospheric resource as a priced, tradable commodity: prices can and do respond to policy design in ways that are difficult to predict in advance, and a poorly calibrated cap can either fail to constrain the underlying resource meaningfully or impose costs considerably higher than intended. Article 6 of the 2015 Paris Agreement has since layered an international framework of cooperative

carbon-credit trading on top of these national and regional schemes, further normalizing the idea, at the level of binding international law, that access to the atmosphere's finite absorptive capacity is something governments can legitimately price, allocate, and trade across borders.

B. Submarines, Spacecraft, and Space Stations: Where Breathable Air Already Has a Price

At a smaller and more literal scale, breathable oxygen is already a priced, engineered, and closely accounted-for commodity in every environment where it does not occur naturally: submarines generate and monitor oxygen through onboard electrolysis and chemical candle systems whose cost is built into naval procurement budgets, and the International Space Station's life support systems, including the Elektron electrolysis unit and oxygen resupply logistics from Earth, represent one of the most expensive per-kilogram supply chains for any commodity in existence, funded through the national space agencies and, since the rise of commercial resupply contracts with firms including SpaceX, through priced commercial contracts for cargo that includes life support consumables. In these bounded, artificial environments, air is not a metaphorical commodity requiring a hypothetical legal framework; it is a real, budgeted, contractually delivered one, governed by ordinary government procurement and contract law rather than any exotic new doctrine. The atmosphere at planetary scale remains, for now, *res communes* in the oldest sense. The air inside a submarine hull or a space station module already is not, and has not been for decades, which suggests that if this essay's premise were ever to move from thought experiment toward reality, the relevant legal starting point would not be a blank page, but the already-existing law of life support contracting, scaled up by many orders of magnitude.

XIII. Conclusion

The atmosphere as a whole has never been owned, and every doctrine examined in this essay, Roman *res communes*, the American public trust, the international common heritage of mankind, converges independently on the conclusion that it legally cannot be, at least not in the straightforward sense of outright transferable title. But the processed, compressed, and delivered oxygen that already moves through hospitals, factories, submarines, and spacecraft has been commercial private property for the better part of a century, produced by an oligopoly regulators already treat as requiring active antitrust scrutiny, and tested, once, under genuine emergency conditions in a way that produced not market-clearing prices but judicially compelled, needs-based rationing.

What this essay's exercise ultimately shows is less about oxygen specifically than about how legal systems handle genuinely indispensable goods generally: the law does not treat essentiality as a reason to forbid commerce outright, since a real industrial oxygen market has operated safely for decades, but it does consistently refuse to let commerce in an

indispensable good operate as an unconstrained free market, reaching instead, every time the question has actually been tested, water in Cochabamba, medical oxygen in Delhi, industrial gas mergers before the FTC, for some combination of mandatory baseline access, price regulation, and a residual, often very old, legal principle holding that certain things remain, in the last analysis, common to all by the law of nature.

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