BioCycle energy

AD INDUSTRY BENEFITS

Lessons From The Birth Of Emissions Trading

Steps taken to resolve challenges to air emissions trading decades ago contain important lessons for implementing "market-based" nutrient trades under the Clean Water Act — and hope for AD benefits under EPA's Clean Power Plan.

Part I

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EMISSIONS trading (ET) gives sources of pollution the flexibility to choose where and how to secure required reductions at the least cost, rather than trying to meet uniform across-the-board mandates. Its air world roots go back to 1973 with a failed Nixon Administration attempt to allow large industrial plants that "modified" their operations to "net out of" (avoid) the Clean Air Act's New Source Performance Standards (NSPS) by reducing sufficient emissions elsewhere in the plant. It proceeded in 1976 with rudimentary U.S. Environmental Protection Agency (EPA) rules allowing economic growth through "new expansions" or "new plants" in dirty air areas, where such sources more than "offset" their new emissions by reductions at other area facilities.

Forty years on, ET is the tool of choice to incentivize air pollution reduction. After advances that included "allowance trading" under the 1990 Clean Air Act's Acid Rain Title plus regional or nationwide programs to reduce interstate smog, vehicle tailpipe emissions and other pollutants, it became a model for the 27-nation European Union Emissions Trading Scheme (2006) and a centerpiece of most country-specific reduction pledges that made the Paris climate change accords possible (COP-21, December 2015).

ET also lies at the core of the EPA's Clean Power Plan (CPP) to cut carbon dioxide (CO_2) emissions from fossil-fueled electric power plants by up to 32 percent over the next 15 years (see "Biogas and the Clean Power Plan," January 2016). The CPP — which is partly designed to accelerate an ongoing shift toward renewable energy and away from fossil fuel-derived power — was developed by EPA under the Clean Air Act (CAA).

Nutrient trading — another tool with similar potential to boost the anaerobic digestion (AD) sector — occurs under the Clean Water Act (CWA). For a variety of reasons its use has lagged far behind "air ET." But optimizing nutrient trades also could lay the groundwork for AD projects to capitalize on CPP opportunities. That seems especially true because improved nutrient trading programs may be put in place more rapidly, due to the CPP's long lead times and the recent Supreme Court stay of CPP implementation (West Virginia v. EPA, Feb. 9, 2016).

Nutrient trading can be accelerated by examining how ET became an air-world paradigm and why that hasn't yet happened under the CWA. This is because "early ET" — like current nutrient trading — involved start-up programs that had to forge their own path.

Nutrient Trading — often called "water quality trading"— to reduce flows of nitrogen and phosphorus still struggles on the Chesapeake Bay and other watersheds, beset by challenges that air emissions trading resolved decades ago. How those air resolutions were achieved contains important lessons for implementing "market-based" nutrient trades. How air emissions trading evolved also suggests ways it will continue to evolve — and how its latest version, the U.S. EPA's Clean Power Plan, may combine with parallel developments to create new prospects for anaerobic digestion projects.

Part I of this two-part article traces why emissions trading became an air-world paradigm, how early developments under the Clean Water Act established a foundation for potentially robust nutrient trading, and why core principles for environmentally-sound trading apply to both worlds. Part Two will examine why nutrient trading has lagged behind air emissions trading and why that seems poised to change.

It's also because a huge reservoir of air experience exists under the CAA to help resolve virtually identical nutrient trading issues.

This two-part article outlines ET's early development and suggests how analogous converging forces may transform the nutrient outcome.

HISTORY MATTERS

For many observers, the ET success story is symbolized by Congressional endorsement of acid rain allowance trading to cut the long-range effects of sulfur dioxide emissions. ET then became a template for initiatives such as EPA's multistate nitrogen oxides reduction program (1998), the Northeast states' Regional Greenhouse Gas Initiative (2006) and the multijurisdiction Western Climate Initiative centered around California's Global Warming Solutions Act (A.B. 32, 2007). But while the acid rain program may have started this cascade, it was preceded by a decade of trial and error that laid important foundations.

ET really got going with EPA's 1979 "Bubble Policy" that allowed existing sources — the vast bulk of emitters — to treat all of a plant's stacks or vents as though enclosed in a giant bubble and reduce emissions where they chose, as long as overall emissions from the bubble were reduced as required. The Bubble Policy collided with all the obstacles nutrient trading faces now: Intense emitter and citizen group suspicion, despite slow progress through conventional means; concerns that it would be a compliance loophole, allow sources to backslide from hard-won control requirements, encourage some emitters to "game the system," or grant others "windfalls" for reductions they would have made anyway (so-called "anyway reductions"); fears of "hot spots" if emitters were not uniformly controlled; doubts regarding the quality or permanence of reductions not made by standard end-of-pipe hardware; and worries about insufficient agency resources to quantify, monitor and enforce alternative reduction plans.

As a result, the first Bubble Policy (January 1979) mostly contained "thou shalt nots." For example, no trades were allowed:

- At existing sources in dirty air areas that lacked approved attainment plans (i.e., most urban airsheds)
- Between one plant and another
- Within a plant between one industrial category (e.g., auto painting) and another (e.g., metal parts coating)
- Between conventional pollutant emission streams and those that contained suspected air toxics
- For sulfur dioxide or particulate emissions that required air dispersion modeling to determine ambient "equivalence"
- At sources that did not commit to install "backstop" conventional controls by short fixed dates — a requirement which discouraged many applicants, given how long it took for bubbles to be approved through State Implementation Plan (SIP) revisions.

There ensued a process of aggressive incrementalism — stepwise removal of constraints to allow broader bubble use that generated early success stories, followed by significant tightening to address genuine issues of environmental integrity.

First, Bubble Policy revisions, starting in December 1979, reduced many limitations, based on real-world applications that showed threshold concerns were overblown. For example, those revisions authorized existing source trades between plants or across industrial categories where the same pollutants were involved. Where trades previously required modeling, they presumed ambient equivalence if trading sources were relatively close. Emission streams containing suspected (though unregulated) toxic components could be traded with "conventional" streams, as long as the toxic stream remained constant or decreased. Bubbles in dirty air areas could be approved under partially-approved SIPs or if they produced an air quality benefit, however small.

Next, procedural changes made it easier for sources to apply for and receive bubbles without being penalized for delays beyond their control. These changes included "parallel processing" by which states and EPA simultaneously proposed to approve bubble applications, cutting approval times roughly in half. They included "direct final" rulemakings where proposed EPA approvals automatically became final if no one objected. They also included EPA's first-ever "generic rule" (1981), allowing states to adopt a one-time SIP clause through which all bubbles that met preset criteria could be state-approved without further federal action. These innovations produced program benefits — resource savings, more state autonomy and increased predictability — beyond the Bubble context.

Last, EPA's Final Emissions Trading Policy (51 FR 43813, Dec. 4, 1986) ("Final [Air] ET Policy") integrated the Bubble with Offsets, Netting, Banking and Generic Rules and articulated a common currency for trades — an Emission Reduction Credit (ERC) that is surplus, permanent, quantified and enforceable. The Final Policy definitively resolved how reductions could be "surplus" in areas without credible plans to attain clean air, and how existing source trades in these areas could be approved. No emission reduction in such areas would be "surplus" unless "objectively elicited by the opportunity to trade" — for example, by being formally "banked" and quantified in anticipation of a trade. No bubble trade in these areas would be accepted unless participating stacks or vents applied stringent baselines and cut overall emissions at least 20 percent beyond those baselines. Thus each bubble would produce "progress beyond the existing State Plan."

These resolutions were tacitly ratified by the 1990 CAA Amendments.

LISTENING MATTERS TOO

Equally important is the way these developments unfolded. From the Bubble's beginning, massive outreach — to EPA regions, key state agencies, national environmental groups, and steel, chemical or refining sectors with high-probability bubble prospects — was central, despite limited staff. Transparent reporting of bubble applications' status and outcomes became routine. Independent assessments of trading results — and possible red flags — by neutral entities like the World Wildlife Fund were commissioned by Bubble personnel and made public.

Many ET changes first were suggested by those who responded to such outreach. Beyond this substantive feedback, open debate built ET credibility. In the end, it created constituencies that were durable enough to absorb mid-course corrections while continuing to file applications that advanced constructive change.

OUTFALLS TO WATER

As air ET moved forward, parallel CWA approaches were evolving. For example, EPA's "Steel Effluent Guidelines Bubble" (49 FR 21204, May 17, 1984) confirmed that a "point source" could be an entire plant with multiple outfalls, not merely a single pipe. The Steel Bubble authorized trades of oil/grease and suspended solids across such outfalls if their total emissions were cut more than required. It reportedly was used by over a dozen integrated steel plants.

The EPA Water Office's wetlands mitigation trading and banking guidance (1986) tackled complex determinations of wetlands "equivalence." EPA case studies and pilot projects (1982-1990) addressed trades between multiple point sources, between point and nonpoint sources, and between urban versus agricultural nonpoint sources at locations such as the Fox River (WI), the Dillon (CO) Reservoir (Denver's main water supply), the Wicomico and Kanawha Rivers (MD; WV), and the Tar-Pamlico Basin (NC). These initiatives indicated that well-designed trades would produce better environ-

mental results if (e.g.) enough dischargers were present and motivated to trade.

In the related drinking water sphere, New York City funded multiple measures across the Catskill/Delaware watershed in lieu of costly microbial filtration. To avoid water price increases, Intel used reverse osmosis to treat its semiconductor wastewater and then used treated water to recharge the Chandler (AZ) aquifer — adding over 4 billion gallons after 1995.

Such results helped support EPA's draft Water Quality Trading Policy Framework (1996) and official Water Quality Trading Guidance (2003).

PLAY IT AGAIN, SAM

This CWA experience indicates that whatever the medium (water or air), trading issues remain broadly the same. Though disputes at the margins are inevitable, they all involve striking reasonable balances that allow real-world use of trades without unacceptable environmental results. Recurring agenda items include:

• Setting appropriate, workable baselines for determining what reductions are "surplus" and thus "creditable" for trades. This must be done in ways that address seller fears that such assets will be confiscated or arbitrarily eroded, buyer fears that the validity of purchased credits will be subject to second guessing, and citizen concerns about worse outcomes than conventional regulation. The Final [Air] ET Policy dealt with these matters by, for example, requiring both lowest-of-actual-allowable-or-presumptive-emissions baselines plus a "trade ratio," to assure "progress from each trade." It also outlined how banked reductions lawfully can be protected from being confiscated by states for "progress" if additional area-wide reductions are required.

• Providing predictable criteria to determine what trades are "equivalent" for ambient quality and health purposes. The Final [Air] ET Policy rested partly on studies that showed "hotspots" — unacceptably high local air pollutant concentrations resulting from overlapping emissions — were more likely to result from tightly constrained versus flexible trading. It also set de minimis ambient impact levels for acceptable trades, concluding that any risks posed by transactions with effects below these levels were outweighed by the environmental and programmatic benefits that would accrue. For such reasons it declined to require either general minimum source-by-source emission reductions, or any general geographic limits on trades more stringent than those in the airshed-based SIPs. It reasoned that such a priori constraints could produce worse health effects, and that specific problems could be addressed through established air quality planning mechanisms. These air world resolutions generally apply under the CWA.

• Limiting use of "anyway" reductions that could undermine progress where routine installation of control equipment produces more-than-required reductions. The "anyway" issue is slippery because sources seldom are obliged to operate equipment in ways that maintain "extra" reductions, or to disclose that such reductions have been made.

Generally, emission reduction banking and trading reverse these negative incentives by discouraging "reduction hoarding" and encouraging disclosure of "extra" reductions so that sources may capitalize on their value. Banking also removes emissions from the air immediately, even if some of them may be used later. These results can make regulators' tasks easier while strengthening environmental management. Specifically, the Final [Air] ET Policy in effect made reasonably achievable emissions the starting point for determining creditable trading reductions, whether or not those emission levels currently were required. As noted above, beyond these baselines it disallowed reductions "not objectively elicited by the opportunity to trade," concluding that efforts to go further by assessing sources' subjective motives for reducing emissions would create a regulatory quagmire. The same principles apply to water pollution discharges and their reduction.

• Resolving tensions between "new" and "existing" sources. The political drive to accommodate economic growth and jobs despite unacceptable pollution typically produces concessions to new or expanding sources in the form of "offsets": Existing sources can provide "extra nonrequired" reductions to offset such growth, but not use them to reduce their own compliance costs. However, new source emissions typically are a tiny fraction of overall discharges, while existing sources are the vast contributor. This underscores that clean air or water ultimately must come from reductions at existing sources.

For nutrients, "reductions at existing sources" are not simple. Urban and agricultural runoff are major contributors that are difficult to quantify or police. But for this very reason it makes little sense to exclude them from the reduced compliance costs, accelerated reductions, and improved monitoring that existing source trade opportunities can spur. Existing sources — an area's industrial, wastewater treatment or agricultural base — typically support far more jobs than whatever new sources may be added to that base. And unlike further point source control, alternative nonpoint source reductions from land-based measures can yield significant ecological benefits — e.g., new terrestrial or aquatic habitat, improved riparian zones, or more balanced ecosystems. The Final [Air] ET Policy recognized such factors by protecting and expanding existing source bubble opportunities, consistent with real-world reduction progress. ■

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SELECT FURTHER READING

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