Commentary

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Nives Dolšak's chapter is a very useful review of several different air-pollution trading programs, analyzed together for the purpose of assessing the value of trading programs as instruments to reduce air pollution. The stated goal of the chapter is to "examine factors that contribute to well-performing tradable-permit markets for reducing air pollution." This chapter has largely achieved this objective. It does a thorough job of identifying the main factors that go into the success of air-pollution trading programs and, importantly, moves the discussion past the simplistic prescription of reducing transaction costs as a salve to make markets work more efficiently. The variety of objectives of air-pollution trading, as Dolšak notes, is more complicated, and therefore, the ability of trading programs to meet those manifold objectives is also more complicated. This chapter makes an important advance in this discussion.

In the spirit of building on this contribution, the bulk of this commentary will focus on new directions and extensions for this important discussion. My comments fall into four categories: (1) the choice of trading programs; (2) the extent to which conclusions can be drawn from this type of analysis; (3) whether institutional analysis is an appropriate lens through which to view air-pollution trading programs; and (4) if institutional analysis is appropriate, how it might proceed.

Choice of Trading Programs

The data set for this analysis consisted of four programs: (1) the EPA's lead phasedown program to reduce the lead content of gasoline, (2) Southern California's Regional Clean Air Incentives Market (RECLAIM), (3) trading in ozone-depleting substances after the 1987 Montreal Protocol, and (4) what Dolšak calls "early EPA emissions trading," which included some early EPA initiatives to introduce some flexibility in emissions regulations. At the outset, it is worth noting that more recent examples of trading programs might be worth attention. The SO_2 trading program under the 1990 Clean Air Act Amendments, for example, surely contains many lessons for future program design. Other more recent programs may be even more relevant for policy analysis, given the current attention to climate change: NO_x trading in the United States, the European Union Emissions Trading System for greenhouse gases, and the Regional Greenhouse Gas Initiative. The most important product of this chapter might be insights that can be used for better design of incipient and still-developing greenhouse gas trading programs, such as that under the Western Climate Initiative.

The analysis in this chapter also prompts us to revisit what we might mean by "emissions trading" or "tradable permits." In particular, one of the analyzed programs, early EPA emissions trading, does not really seem to be trading at all, but a series of one-off policies and regulatory bargains with individual emitters or groups of emitters that EPA struck in its earliest years. "Emissions trading" might better be viewed as a concept in which trades are decentralized, are not made with the EPA, and do not require some adjudication by the EPA or any other government agency in order to be consummated. Emissions trading must be decentralized; there can be no structural information asymmetry, as there would be when individual emitters come to the EPA peddling an emissions-reduction bargain. In light of this, the lessons from early EPA emissions trading would seem to be of somewhat limited value in the design of future emissions-trading programs.

Robustness of Conclusions

This chapter's identification of the important factors that go into what can plausibly be considered "success" or "failure" is valuable, but some care is needed in concluding whether programs actually achieve success. A fundamental problem with drawing conclusions from this type of analysis is that the baseline counterfactual against which the outcomes of the trading program can be measured is difficult to draw. To say that a trading program is "successful," either environmentally or economically, requires some construction of what would have occurred without the program. Establishing this baseline counterfactual requires a great deal of data analysis and economic ingenuity, but it has been done. One of the best pieces of economic analysis of trading is that of Carlson et al. (2000), which measures the gains from SO_2 emissions trading. These gains derive not only from the trades themselves, but from the flexibility offered by emissions trading. For example, just by making other compliance options possible, emissions trading created new opportunities to lower compliance costs. For example, scrubbing costs were lowered redesigning scrubbers so that they no longer carried a spare scrubbing module (which was, in essence, a designed redundancy) to provide for scrubbing during maintenance and repair periods. During maintenance and repair periods, emissions could simply be vented, and permits could be bought to cover that relatively small blip in emissions. These types of compliance strategies are also described in Ellerman et al. (2000) and accounted for a large part of the compliance cost savings under the SO_2 program.

The Appropriateness of Institutional Analysis

The importance of institutional analysis in environmental and natural resource problems can hardly be overstated. Dolšak's approach is institutional, but the most important lessons from this chapter, which concern the factors contributing to the success of trading programs, are not fundamentally institutional. Many important lessons seem to concern market design, for which an institutional approach has some limitations. For example, we know that price breadth is important to maximize the coverage of subindustries in which innovation might take place and lead to unexpected compliance cost savings. We know that price breadth is also important

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to ensure that leakage into nontrading sectors does not cancel out the hard-won emissions reductions in the trading sectors. We know that price volatility deters development of alternative energies that reduce emissions. And we know thatif trading markets allow offsets that are worth hundreds of thousands of dollars more than the underlying product behind the pollution, then pollution may increase because of the enormous incentive to manufacture a false counterfactual that exaggerates the impact of the offset project. This increases overall pollution because the offsets permit pollution that might otherwise not be allowed. The now-familiar horror story of how Chinese hydrochlorofluorcarbon plants have been constructed for the sole purpose of securing offsets is the sort of lesson that is of crucial importance. The mix of institutional and market-design questions therefore calls for a broad approach that is less explicitly institutional in nature. At the very least, institutional choices have to be investigated against the backdrop of an array of market-design principles. For example, a descriptive account of how the Clean Development Mechanism (CDM) program of the Kyoto Protocol developed and of the institutional factors that went into its design offers only a partial lesson. A truly useful lesson in how to make emissions-trading markets work effectively would also include a normative analysis that would guide future trading program development to avoid some of the problems stemming from the CDM program. In that kind of analysis, institutional analysis may provide a cautionary note on institutional pitfalls rather than normative guidance on program and institutional design.

Whither Institutional Analysis?

Despite the limitations of a pure institutional approach, it is worth noting that emissions-trading programs might be the subject of some very interesting institutional analysis research. For example, what accounts for the many decisions that were made in developing the RECLAIM program? What exactly was the mandate of the South Coast Air Quality Management District in developing RECLAIM? Did monitoring and enforcement capabilities dictate how RECLAIM was structured? The evolution of the EPA over time must be one of the most interesting institutional analysis projects that could be imagined. How, in institutional terms, does an agency move from early emissions trading, such as bubbling and netting and offsetting, to the hard SO_2 cap-and-trade program and even defy political interests in pushing forward with NO_x trading? And the current climate, in which the EPA is pushing forward (under court mandate) in regulating the emissions of greenhouse gases under the Clean Air Act, begs for an institutional analysis. Analyzing changes in staffing of the EPA, with its external political influences, would seem to be one of the great institutional analysis projects that could be undertaken.

In summary, Dolšak's chapter moves discussion forward. This commentary is intended to highlight new directions suggested by Dolšak's contribution. The paths not taken, and their relative attractiveness, are never apparent until at least one path is taken.

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REFERENCES

Carlson, Curtis, Dallas Burtraw, Maureen Cropper, and Karen L. Palmer. 2000. Sulfur dioxide control by electric utilities: What are the gains from trading? *Journal of Political Economy* 108:1292–1326.

Ellerman, A. Denny, Paul L. Joskow, Richard Schmalensee, Juan-Pablo Montero, and Elizabeth M. Bailey. 2000. *Markets for Clean Air*. Cambridge, U.K.: Cambridge University Press.