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## REASONABLE EPA PROJECTION TECHNIQUES FOR ESTIMATING TECHNOLOGICAL ADVANCES UPHELD

**ENVIRONMENTAL LAW—AUTO EMISSIONS STANDARDS:** The EPA, in promulgating diesel auto emission standards, may make projections of future technological advances and the time required to attain them. These projections must be reasonable, considering theoretical objections to the technology and remaining practical problems to be solved, before the technology is implemented. *National Resources Defense Council, Inc. v. U.S. Environmental Protection Agency*, 655 F.2d 318 (D.C. Cir. 1981).

For more than twenty years our nation's lawmakers have been aware of the environmental problems caused by airborne pollutants.<sup>1</sup> A major portion of the atmospheric pollutants in many larger cities derives from automobile exhaust.<sup>2</sup> Carbon monoxide, unburned hydrocarbons, oxides of nitrogen, and particulates constitute the greatest recognized hazards to the population and the environment resulting from the operation of internal combustion engines.<sup>3</sup>

The Clean Air Act (Act)<sup>4</sup> demonstrates the magnitude of congressional concern with the problems associated with atmospheric pollution. The Act authorizes the Environmental Protection Agency (EPA) to regulate, among other things, the emission of harmful pollutants from motor vehicles. The regulatory scheme contained within the Act contemplates two types of standards with respect to automobile emissions. Absolute standards, such as those specified for carbon monoxide, hydrocarbons, and oxides of nitrogen, are set by the Act itself and may be subject to waiver provisions.<sup>5</sup> In addition to these fixed standards, the Act empowers the EPA Administrator to promulgate standards applicable to other pollutants which in his judgment either cause or contribute to air pollution or may reasonably be anticipated to endanger public health or welfare.<sup>6</sup> These standards must be prospective in nature and allow for such lead time as the Administrator determines is necessary to permit the development and application of the required technology.<sup>7</sup> The standards are technology-forcing because they require that a certain level of technology be established by the end of a set grace period. It is quite clear from the legislative history of the Act that Congress intended these standards to be technology-forcing and that it expected EPA to make projections of future advances

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1. I A. REITZE, JR., ENVIRONMENTAL LAW three-27 (1972).

2. J. BRECHER & M. NESTLE, ENVIRONMENTAL LAW HANDBOOK 182 (1970).

3. F. GRAD, ENVIRONMENTAL LAW § 3-2-3 (1978).

4. 42 U.S.C. § 7401-7642 (Supp. II 1978).

5. *Id.* at § 7521(b)(1).

6. *Id.* at § 7521(a)(1).

7. *Id.*

in pollution control technology to form the basis for setting such standards.<sup>8</sup>

Historically, tension has existed between technology-forcing statutes, such as the Clean Air Act, and technological feasibility. It usually appears in the form of a dispute between the regulatory agency and the regulated industry over whether the technology required to implement the standard exists or can be developed within the required time.<sup>9</sup>

This tension, coupled with concern over fuel efficiency and exhaust pollutants, has led to evaluations of different engine types in a search for alternatives to the gasoline engine for use in light duty vehicles.<sup>10</sup> The diesel engine has been proposed as an attractive alternative because of its greater fuel efficiency and lower emission of certain regulated pollutants.<sup>11</sup> However, diesel vehicles emit from 30 to 70 times the particulates emitted by gasoline engines of comparable size.<sup>12</sup> Studies of the size distribution of these particulates and the nature of the organic compounds contained on their surfaces have shown that their inhalation will result in significant lung deposits with possible carcinogenic or mutagenic potential.<sup>13</sup>

Concern over these potential hazards led the EPA to promulgate standards which became effective April 4, 1980, for particulate emissions from light duty diesels.<sup>14</sup> These regulations limited diesel particulates to 0.60 grams per vehicle mile (gpm) for model year 1982 and to 0.20 gpm in model year 1985.<sup>15</sup>

On May 5, 1980, General Motors Corporation (GM) submitted a petition requesting that the EPA reconsider these standards. The Administrator denied this request on June 27, 1980 and GM appealed.<sup>16</sup> In *Natural Resources Defense Council, Inc. v. United States Environmental Protection Agency (NRDC v. EPA)*,<sup>17</sup> GM's challenges to these standards, along

8. S. REP. NO. 1196, 91st Cong., 2d Sess. 24 (1970), reprinted in 1 LEGISLATIVE HISTORY 424; H.R. REP. NO. 294, 95th Cong., 1st Sess. 273, reprinted in 1977 U.S. CODE CONG. & AD. NEWS 1077, 1352, 4 LEGISLATIVE HISTORY 2740.

9. Typical industry complaints are that the projections of future technological advances by the regulatory agency are unsound, unscientific, over-optimistic, based solely on theoretical instead of practical considerations, not feasible from a cost or engineering standpoint, or some combination of the above.

10. Light duty vehicles include any passenger car or passenger car derivative capable of seating 12 passengers or less. 40 C.F.R. § 86.077-2 (1980).

11. 45 Fed. Reg. 5480, 5493 n. 192 (1980).

12. 45 Fed. Reg. 14,496 (1980).

13. R. Cuddihy, W. Griffith, C. Clark & R. McClellan, Potential Health and Environmental Effects of Light Duty Diesel Vehicles II (Oct. 1981) (unpublished manuscript).

14. See note 12 *supra*.

15. The standard for light duty diesel trucks was set at 0.26 gpm for 1985.

16. Any appeal from a final action taken by the Administrator after the promulgation of an automobile emission standard must be filed in the United States Court of Appeals for the District of Columbia. 42 U.S.C. § 7607(b) (Supp. II 1978).

17. 655 F.2d 318 (D.C. Cir. 1981).

with challenges by other automobile manufacturers and by the Natural Resources Defense Council (NRDC)<sup>18</sup> were consolidated before the District of Columbia Court of Appeals.

The auto industry maintained that the 1985 standard of 0.20 gpm was too strict and that EPA's prediction that the trap oxidizer, an experimental particulate removal device, would be perfected in time for installation on 1985 models was unfounded. They argued that this prediction was unduly optimistic and failed to take into account engineering realities. NRDC, on the other hand, argued that the standards were not strict enough. They disagreed with EPA's decision to set a single standard for all light duty vehicles based on the poorest performing engine, urging instead that a variable standard be implemented which would impose more demanding requirements on the better performing vehicles. They also urged less delay in implementing all standards. The court upheld EPA's regulations. It concluded that EPA could use reasonable projection techniques to estimate technological advances and that regulations based on these techniques should be upheld unless clearly arbitrary and capricious.<sup>19</sup>

In its analysis, the court first considered the appropriate standard of review. Courts traditionally will set aside agency actions only if the actions are found to be arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.<sup>20</sup> This policy was codified in the Clean Air Act.<sup>21</sup> In *Portland Cement Ass'n. v. Ruckleshaus* the court elaborated:

[t]he necessity to review agency decisions, if it is to be more than a meaningless exercise, requires enough steeping in technical matters to determine whether the agency has exercised a reasoned discretion. . . . We cannot substitute our own judgment for that of the agency, but it is our duty to consider whether the decision was based on a consideration of the relevant factors and whether there has been a clear error of judgment.<sup>22</sup>

This position was re-emphasized in *Essex Chemical Corporation v. Ruckleshaus* where the court stated: "[o]ur expertise is not in setting standards for emission control but in determining if the standards as set are the result of reasoned decision-making."<sup>23</sup> This led the court in *NRDC v. EPA* to try to determine what constitutes reasoned decision making and by what guidelines it can be measured.

*International Harvester v. Ruckleshaus*<sup>24</sup> provided an operational def-

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18. The Natural Resources Defense Council is a lobby group devoted to the preservation of our natural environment.

19. 655 F.2d at 344.

20. *Citizens to Preserve Overton Park, Inc. v. Volpe*, 401 U.S. 402 (1971).

21. 42 U.S.C. § 7607(d)(9)(A) (Supp. I 1977).

22. 486 F.2d 375, 402 (D.C. Cir. 1973), *cert. denied*, 417 U.S. 921 (1974).

23. 486 F.2d 427, 434 (D.C. Cir. 1973), *cert. denied*, 416 U.S. 969 (1974).

24. 478 F.2d 615 (D.C. Cir. 1973).

inition of reasoned decision making. The court therein upheld the EPA's power to make projections of future technological advancements but emphasized that "the Administrator's latitude for projection is subject to the restraints of reasonableness, and does not open the door to crystal-ball inquiry."<sup>25</sup> The court held that the EPA must show a reasonable basis for believing its projections to be reliable, including "a showing of the reliability of the methodology of prediction."<sup>26</sup>

While *International Harvester* provides some guidelines as to the court's interpretation of what reasoned decision making is, it is important to note that EPA was not, on that occasion, predicting future technological advances, but instead was making its own interpretation of current data produced by the auto industry. In a situation such as this, where facts relating to the feasibility of a technology or standard are readily available and the only real controversy is over the interpretation of those facts, courts continue to be very demanding in their inquiry into agency methodology.<sup>27</sup>

On the other hand, where the predictions made by a regulatory agency involve questions at the frontier of scientific knowledge, the agency has been held to have broad discretion to make its projections to the best of its ability by using whatever information is available.<sup>28</sup> As stated in *Ethyl Corporation v. EPA*,<sup>29</sup> "[t]he Administrator may apply his expertise to draw conclusions from suspected, but not completely substantiated, relationships between facts, from trends among facts, from theoretical projections, from imperfect data, from probative preliminary data not yet certifiable as fact, and the like."<sup>30</sup>

The prediction of the technological feasibility of the trap oxidizer at issue in *NRDC v. EPA*<sup>31</sup> falls somewhere between these two extremes. A prototype trap oxidizer has been developed and it works. Thus, the technology required for the particulate standards is not only theoretically possible, but also falls within the realm of engineering reality. However, it is not without engineering problems which must be solved before the device can be included on light duty diesel vehicles. These problems include the development of a durable filter material, selection of a workable incineration method, and improvement of efficiency. The court concluded that EPA had adequately defended the reasonableness of its basis for prediction of the technological feasibility of the trap oxidizer by (1)

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25. *Id.* at 629.

26. *Id.* at 642.

27. *National Lime Association v. EPA*, 627 F.2d 416 (D.C. Cir. 1980).

28. *Industrial Union Department v. Hodgson*, 499 F.2d 467 (D.C. Cir. 1974).

29. 541 F.2d 1 (D.C. Cir. 1976), *cert. denied*, 426 U.S. 941 (1976).

30. *Id.* at 28.

31. 655 F.2d 318 (D.C. Cir. 1981).

answering the theoretical objections to the trap oxidizer, (2) identifying the major steps necessary to ready the device for mass production, and (3) presenting plausible reasons for believing that each of those steps in (2) can be completed within the time allowed by the regulation.<sup>32</sup>

On the surface, the court's three-step standard for determining whether EPA's projections are the result of reasoned decision making seems to be a workable one. If a technology is shown to be theoretically achievable and the remaining steps necessary to refine it can be identified, it is at least possible that, in time, the remaining problems can be worked out and the technology put to practical use. The critical question is what criteria the agency should use to evaluate whether each of the remaining steps necessary for refinement of the technology can be completed within the time available. The EPA has convinced the court that these criteria should be: (1) initial partial success of the project, (2) the rapidity of recent progress, and (3) industry predictions of future progress.<sup>33</sup>

While these criteria may be useful as indicators of future progress in a new technology, they should not be treated as dispositive. The criteria assume a linear relationship between progress made in a new technology and time elapsed since its inception. This assumption is faulty because the usual pattern of development is an initial flurry of success followed by a much slower rate of advancement, during which time the more difficult engineering problems are worked out. Thus, the reviewing court should ensure that the agency has focused on the character of the unsolved problems themselves, rather than on the rapidity of progress to date, in determining whether the agency's projections of progress are plausible.

Judge Robb, in his dissent, stated that he agreed with the majority's three-step standard for judging the reasonableness of the EPA's basis for prediction. He felt, however, that, in this case, the EPA had not offered plausible reasons for believing that each of the major refinement steps can be completed within the time available.<sup>34</sup> In making this argument, the dissent misses the critical point. Under the majority's criteria for evaluation of plausibility, the EPA met this requirement. EPA referred to industry test results which demonstrate some limited initial success with a prototype trap oxidizer.<sup>35</sup> EPA pointed out the definite rapid initial progress over the last 1½ years in the areas of efficiency and incineration techniques.<sup>36</sup> Further, EPA referred to manufacturer's speculations that the trap oxidizer could possibly be introduced in 1985 production automobiles. The "wrong result," which the dissent feels was reached in this

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32. *Id.* at 332-36.

33. *Id.* at 334-35.

34. *Id.* at 345.

35. 45 Fed. Reg. 14,496, 14,498 (1980).

36. *Id.*

case, arises not because the EPA did not meet its criteria for determining plausibility, but rather because the criteria themselves were faulty. The agency's characterization of the remaining improvements necessary as "engineering problems, and . . . more a function of the resources allocated to the problem than any scientific or technical breakthrough"<sup>37</sup> is a gross oversimplification. It does not reflect a hard look at the character and nature of the engineering difficulties themselves.

*NRDC v. EPA* represents a continuation of the policy of the District of Columbia Court of Appeals to uphold the technology-forcing nature of the Clean Air Act. The majority has attempted to clarify the somewhat vague references to "reasonable projections of technological advances" referred to in earlier opinions, and has made commendable progress in this area. The court upheld a regulatory agency's power to make reasonable projections of the time needed for technological advances in the setting of standards. Such projections will be reasonable if the agency: (1) answers any theoretical objections to the technology, (2) identifies the major steps necessary for practical applications, and (3) offers plausible reasons for believing that each of the major steps in (2) can be completed in the time available. Finally, they have adopted the agency's criteria for determining the plausibility required in (3), which consider initial partial successes in the development of the technology, the rapidity of recent progress, and industry speculation regarding future progress. Adoption of these agency criteria represents the only major flaw in the court's decision. The court should replace these criteria with criteria that focus on the character of the engineering and developmental problems themselves in order to project how long their solution will take, rather than rely on past progress. It is up to the courts to provide guidance in this area. It is only with the aid of such guidance that both industry and environmental agencies will know what is expected of them and will be better able to effect long range planning.

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37. 655 F.2d at 333.