

Overview of Legal Issues Arising in the Development of Federal and State Appliance Efficiency Standards

R. Alta Charo, Lisa R. Stearns, Michael Case

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I. INTRODUCTION

The annual output of more than six large (1,000 mw) coal or nuclear plants was required to operate the major electrical appliances sold in 1981 alone.¹ One 1984 estimate suggests that appliances, air conditioners and water heaters account for about 50% of residential energy consumption.² Increasing appliance efficiency therefore promises both consumer savings and conservation of significant energy resources. Moreover, the technology for capturing these potential savings is developing rapidly. The

1. H. GELLER, *ENERGY EFFICIENT APPLIANCES 1* (1983) (American Council for an Energy-Efficient Economy and the Energy Conservation Coalition).

2. H. GELLER, *EFFICIENT RESIDENTIAL APPLIANCES AND SPACE CONDITIONING EQUIPMENT: CURRENT SAVINGS POTENTIAL, COST EFFECTIVENESS AND RESEARCH NEEDS* (July 1984) (American Council for an Energy-Efficient Economy, Washington D.C.) (calculation of consumption was on a primary basis).

Appendix lists the highly efficient top-rated models sold in 1980 and 1984.³

The best means to ensure that progress in efficient technology continues has been a source of vigorous debate. One side argues that rising fuel prices and the accompanying increase in market demand for more efficient appliances is an adequate incentive for the continued development of efficient technologies.⁴ The other side insists that market forces are insufficient and that the most rapid technological developments have occurred in response to regulatory requirements or the prospect of such requirements.⁵

Many states and the federal government have been persuaded by the latter argument. The appeal of a workable set of uniform national appliance efficiency standards led Congress, in 1978, to authorize the establishment of such standards with respect to major residential appliances.⁶ The national performance standards called for by federal legislation have not yet been promulgated, however. In 1982 and 1983, DOE concluded that efficiency standards were unnecessary for nine widely-used products. These "no-standards" standards were challenged in *NRDC v. Herrington*.⁷ Responding favorably to the NRDC case, the District of Columbia Circuit Court held in July 1985 that in important respects the "no-standards" standards were based on determinations that were unsupported by substantial evidence and were contrary to law.⁸

Unless *Herrington* is successfully appealed, new federal rulemaking will take place before federal efficiency standards are issued. The holdings of the court in the *Herrington* case will color these

3. GELLER, *supra* note 1, at 3.

4. DOE placed some reliance on this argument in the development of its "no-standards" standards. See 48 Fed. Reg. 39,380 (1983). Some manufacturers have also taken this line. See GELLER, *supra* note 2, at 2, referring to comments presented by the Association of Home Appliance Manufacturers to DOE on proposed rulemaking in June 1982.

5. GELLER, *supra* note 1, at 2; NATIONAL AUDUBON SOCIETY, AUDUBON ENERGY PLAN, Vol. 11, at c-15 (1984).

6. National Energy Conservation Policy Act, Pub. L. No. 95-167, 42 U.S.C. § 6292 is one of the five Acts constituting the National Energy Act. See also Pub. L. No. 95-617 (Public Utilities Regulatory Act), Pub. L. No. 95-618 (Energy Tax Act of 1978), Pub. L. No. 95-620 (Powerplant and Industrial Fuel Act of 1978), and 95-62 (Natural Gas Policy Act of 1978). For products covered under Pub. L. No. 95-169 see 42 U.S.C. § 6292 and note 10 *infra*.

7. *Natural Resources Defense Council v. Herrington*, 768 F.2d 1355 (D.C. Cir. 1985) (Cir. Case No. 83-1195, and consolidated cases 83-2128, 83-2312, and 84-1055) [hereinafter cited as *Herrington*].

8. *Id.* at 1364.

future rulemaking proceedings. In the meantime, existing state statutes apply and the states are free to pursue additional state regulation of appliance efficiency. Proponents of appliance efficiency standards must, under these circumstances, be prepared to participate in future federal rulemaking and to take action at the state level. This memorandum provides an overview of the legal issues likely to arise in the development of both federal and state appliance efficiency standards.

After a brief examination of the statutory requirements of the federal enabling legislation and of the history of the DOE "no-standards" standards, Section II proffers a more detailed consideration of the effects of the *Herrington* decision on future DOE rulemaking in this area.

Section III proceeds to a discussion of the impact of *Herrington* on state appliance efficiency legislation. The likely federal timetable in issuing new regulations and questions of preemption will affect both the willingness of states to undertake legislation in this area as well as the character of the legislation they will consider.

Because state initiatives are likely to reemerge in the aftermath of *Herrington*, Section IV analyzes existing state provisions on issues which will arise in the process of drafting additional state law in this area.

II. THE STATUS OF FEDERAL APPLIANCE EFFICIENCY REGULATION

A. *Statutory Requirements*

In 1975, Congress passed the Energy Policy and Conservation Act⁹ which, through a combination of oil price controls and programs for conservation and development, sought to enhance the nation's energy self-sufficiency. Sections 322-39 of the Act contained a number of measures calculated to improve the energy efficiency of certain covered types of consumer products.¹⁰

9. Energy Policy and Conservation Act, Pub. L. No. 94-163, 89 Stat. 871, 919-32 (1975).

10. 42 U.S.C. §§ 6291-6309 (1982). The following appliances appear on the list of covered products: refrigerators and refrigerator-freezers, freezers, dishwashers, clothes dryers, water heaters, room air conditioners, home heating equipment other than furnaces, televisions, kitchen ovens and ranges, clothes washers, humidifiers and dehumidifiers, central air conditioners, and furnaces. In addition, the Secretary of Energy (the Secretary) may include any product which uses an average of more than 100 kilowatt-hours (KWH) or its Btu equivalent per household per year. 42 U.S.C. § 6292(a)(1-14) (1982).

The first two measures, as amended in 1978, serve to gather data on appliance efficiency through product testing¹¹ and to disseminate consumer information through labelling.¹² A third provision, also amended in 1978, addresses itself to appliance efficiency standards.¹³

1. Product Testing

As amended, section 323 of the Energy Policy and Conservation Act requires the Secretary to prescribe standard test procedures for determining the energy consumption and operating costs of all covered products.¹⁴ Such testing is to serve as a basis for the labelling and efficiency standards programs discussed below. This section also prohibits sellers from representing energy consumption characteristics of covered products unless the representation fairly discloses the results of tests administered in accordance with the procedures.¹⁵

2. Labelling

In order to assist consumers in making more informed purchase decisions, the Federal Trade Commission (FTC) was required to promulgate labelling rules unless it determined that labelling was not "technologically or economically feasible," for a given type or class of appliance.¹⁶ The rules shall include the requirement that covered products bear labels containing the estimated annual operating costs as determined under the testing procedure set out in section 323.¹⁷ They shall also include a description of the type or class of products to which the rule applies,¹⁸ a description of the test procedures used in determining annual operating costs,¹⁹ and a prototype label and directions for its display.²⁰

11. 42 U.S.C. § 6293 (1982), 10 C.F.R. 430.1-430.49 (1985).

12. 42 U.S.C. § 6294 (1982).

13. 42 U.S.C. § 6295 (1982).

14. 42 U.S.C. § 6293 (1982).

15. 42 U.S.C. § 6293(c)(1) (1982).

16. 42 U.S.C. § 6294(a)(2) (1982).

17. 42 U.S.C. § 6294(c)(1)(A) (1982).

18. 42 U.S.C. § 6294(c)(2)(A) (1982).

19. 42 U.S.C. § 6294(c)(2)(C) (1982).

20. 42 U.S.C. § 6294(c)(2)(D) (1982).

3. Appliance Energy Efficiency Standards

The original provisions applying to appliance energy efficiency encouraged the setting of voluntary standards.²¹ In 1978, these were replaced with provisions for the development of mandatory efficiency standards, under which the Secretary is directed to prescribe standards for thirteen priority products and to issue rules governing the classification of other products.²² Before issuing standards, the Secretary must make determinations regarding whether a standard: 1) will result in significant energy conservation, 2) is technologically feasible, or 3) is economically justified. If any one of these criteria is not met the statute prohibits the Secretary from prescribing a standard.²³

No guidelines exist to direct the Secretary in determining whether a standard would result in "significant conservation of energy." Nor does the Act offer any definition of "technologically feasible." By contrast, the Act sets out six factors which the Secretary must weigh when deciding if a standard is economically justified:

1. The economic impact of the standard on the manufacturers and consumers of the product subject to such standards,
2. The savings in operating costs throughout the estimated average life of the covered product in the type (or class) compared to any increase in the price of, or in the initial charges for, or maintenance expenses of, the covered products which are likely to result from the imposition of standards,
3. The total projected amount of energy savings likely to result directly from the imposition of the standard,
4. Any lessening of the utility or the performance of the covered product likely to result from the imposition of the standard,
5. The impact of any lessening of competition determined in writing by the Attorney General that is likely to result from the imposition of the standard,

21. Pub. L. No. 94-163, 89 Stat. 871, at 923-26 (sec. 325) (1975).

22. Pub. L. No. 95-619, 92 Stat. 306 (1978) codified at 42 U.S.C. § 6295 (1982). *See supra* note 10 and accompanying text.

23. 42 U.S.C. § 6295(b)(2) (1982).

6. The need of the nation to conserve energy, and
7. Any other factors the Secretary considers relevant.²⁴

B. *Brief History of the Federal "No-Standards" Standards*

The following chronology describes the administrative and judicial proceedings which led to the *Herrington* decision.

January 2, 1979: DOE published notice of proposed rulemaking for efficiency standards applying to the nine top priority product types. It concurrently requested written comments, and announced public meetings.²⁵

December 13, 1979: DOE published notice of proposed rulemaking for the four lower priority products, with request for comments and notice of public meetings. It also published and explained the questionnaire being sent to product manufacturers.²⁶

June 30, 1980: DOE proposed standards for eight of nine top priority appliances; held more public meetings; and invited comments on, *inter alia*, the economic justifications for the standards.²⁷

September 2, 1980: DOE sought comments and announced public meetings on the issues of certification and enforcement, which had been raised by industry representatives. Dialogue on these issues continued through the autumn of 1980.²⁸

January 1981: DOE informed Congress that, except for some fine tuning, the standards were complete.²⁹

24. 42 U.S.C. § 6295(d) (1982). The House bill, instead of requiring the comparison in paragraph (2), separated the two elements of that comparison and included the following quantified factor:

The total cost, per Btu, in obtaining the energy savings likely to result from imposing the standard, computed for such type (or class) of covered product by dividing the average charges and expenses . . . by the energy savings . . .

H.R. REP. No. 543, 95th Cong., 1st Sess. 122. This factor was deleted in conference because "the conference substitute requires the Secretary to weigh the factors, and because the increase in initial charges and any change in maintenance costs and energy savings will be quantified and compared. . . ." H.R. REP. No. 1751, 95th Cong., 2d Sess. 116. While the conferees expected the Secretary to quantify the factors when possible, they did not intend quantification of a factor to enhance its weight. *Id.*; see also S. REP. No. 409, 95th Cong., 1st Sess. 63 (1977).

25. 44 Fed. Reg. 49 (1979).

26. 44 Fed. Reg. 72,276 (1979).

27. 45 Fed. Reg. 43,976 (1980).

28. 45 Fed. Reg. 58,132 (1980). See also 45 Fed. Reg. 65,605 (1980), 45 Fed. Reg. 79,078 (1980).

29. *Herrington*, 768 F.2d at 1367.

January 21, 1981: The Reagan Administration entered office heralding a change in several DOE administrative policies.

February 19, 1981: DOE issued a message to Congress proposing repeal of the appliance program.³⁰

February 23, 1981: DOE announced that no standards would be finalized until the economic analysis the proposed rules was studied further.³¹

October 1981: More than eight months after the statutory deadline for issuance of standards had passed, National Resources Defense Council (NRDC) and Consumers' Union filed suit to compel promulgation of standards.³²

April 2, 1981: DOE published notice of proposed rulemaking for eight priority products, with a request for written comments and a notice of public meetings. The proposal recommended that a "no-standards" standard be adopted. The 1981 NRDC suit was settled.³³

December 22, 1982: DOE promulgated a "no-standards" standard for clothes dryers, kitchen ranges and ovens, basing their action on a determination that standards would result in no significant conservation of energy and that the standards were not economically justified.³⁴

August 30, 1983: DOE promulgated a final "no-standards" standard for six additional high priority products. For all six, DOE found standards were not economically justified, and, for all but central air conditioners, that standards offered an insignificant potential for energy conservation.³⁵

Late 1983: National Resource Defense Council, Inc. (NRDC) filed suit objecting to the 1982 and 1983 "no-standards" standards. This case, *NRDC v. Herrington*, was later consolidated with four other cases which also challenged the 1982 and 1983 standards.³⁶

April 1, 1985: DOE published notice of proposed rulemaking for four low priority products with a request for written com-

30. See U.S. DEP'T. OF ENERGY, REDUCTION OF ENERGY CONSERVATION PROGRAMS, in AMERICA'S NEW BEGINNING: A PROGRAM FOR ECONOMIC RECOVERY, 4-20 (1981), cited *id.* at 18-19, n.13.

31. 46 Fed. Reg. 13,517 (1981).

32. *NRDC v. Edwards*, Civ. No. 80-2546 (D.D.C.).

33. 47 Fed. Reg. 14,424 (1982).

34. 47 Fed. Reg. 57,198 (1982). 10 C.F.R. § 430.32 (1985).

35. 48 Fed. Reg. 39,376 (1983). 10 C.F.R. § 430.32 (1985).

36. *Herrington*, *supra* note 7.

ments and notice of public hearings. They proposed that no standards be adopted.³⁷

July 16, 1985: The United States Court of Appeals for the District of Columbia Circuit held in *NRDC v. Herrington* that the DOE "no-standards" standards were void because they represented arbitrary and capricious interpretations of the Energy Policy and Conservation Act (EPCA).³⁸

C. *Effect of the Herrington Decision on Future DOE Appliance Standard Rulemaking*

The court in *Herrington* struck down the DOE "no-standards" standards. It declined to compel an independent review of the voided 1982 and 1983 standards since, under the enabling statute, the rules were due to be reviewed by 1987 and 1988 respectively.³⁹ The court merely required therefore that in the course of the statutory review DOE take into account certain deficiencies in the analysis which led to the "no-standard" standards.⁴⁰ Assuming that the Department would take as long in conducting the EPCA-required review as it did in formulating the 1982 and 1983 final rules, the *Herrington* court estimated that DOE should begin its five year reconsideration of the appliance standards in February of 1986.⁴¹

According to an attorney for petitioners, the *Herrington* decision "makes it virtually inevitable that minimum energy efficiency standards will be issued after a new rulemaking."⁴² That prognosis is

37. 50 Fed. Reg. 12,966 (1985).

38. *Herrington*, 768 F.2d 1355.

39. 42 U.S.C. § 6295(h)(1): "Not later than 5 years after prescribing an energy efficiency standard under this section (and from time to time thereafter), the Secretary shall—
(a) conduct a reevaluation in order to determine whether such standard should be amended in any manner, and
(b) make and publish in the Federal Register, such determination.

In conducting such reevaluation, the Secretary shall take into account such information as he deems relevant, including technological development with respect to the type (or class) or products involved, and the economic impact of the standard. . . ."

40. *Herrington*, 768 F.2d at 1433. The court noted:

Our decision today will require a comprehensive reappraisal of the appliance program. We do not, of course, require any particular outcome in the new rulemaking that DOE must conduct, but we hope and expect that so long as EPCA is on the books, the agency will exercise its reasoned discretion within a fair view of the limits set by Congress The . . . rules under review are set aside.

41. *Id.* at 1409.

42. Natural Resources Defence Council, Press Release: Court of Appeals Throws Out Appliance Regulations in Major Victory for NRDC (July 16, 1985).

not certain however. The court did not address the question of how the DOE should exercise its discretion in balancing the benefits and burdens of regulation.⁴³ It therefore remains possible for DOE to conclude that even under a "corrected" analysis the burdens of applying an efficiency standard to a particular product may still outweigh the benefits.

Regardless of the outcome of future rule-making proceedings, however, it will be incumbent upon the Department to give careful consideration to the directives of the court in *Herrington*. These directives focus on what is required by the statutory directives that the Secretary determine whether a standard: 1) will result in significant conservation of energy; 2) is technologically feasible; and 3) is economically justified.⁴⁴ The following discussion of the Court's holdings on these issues is important in commenting on future federal rulemaking, and in evaluating proposed state legislation on appliance efficiency.⁴⁵

1. Significant Conservation of Energy

Whether a standard will result in a "significant conservation of energy" requires two threshold determinations: whether a standard will produce energy savings, and whether those savings will be significant. The court found that the statute largely leaves these determinations to the discretion of the Secretary.⁴⁶ The methods for projecting economic impacts and the tests applied to significance must be consistent, however, with the express terms and intent of the enabling Act.⁴⁷ The analysis of the Court provides a guide.

a. Energy Savings. DOE calculated savings by comparing a standards case, which projected future energy consumption by particular appliances if standards were imposed, with a base case, which projected energy consumption in the absence of standards.⁴⁸ The Department reasoned that savings do not "result" from standards if the same savings would have been

43. *Herrington*, 768 F.2d at 1416-17.

44. 42 U.S.C. § 6295(b)(2) (1982).

45. For a discussion effect of *Herrington* on state regulatory initiative in this area see text accompanying notes 104-15 *infra*.

46. *Herrington*, 768 F.2d at 1372.

47. *Id.*

48. *Id.* at 1383.

achieved without standards.⁴⁹ This interpretation was held to be reasonable and may be applied in future rulemaking.⁵⁰

To compare the energy used without a standard during a particular period to the energy used with a given standard, DOE used the Oak Ridge National Laboratory (ORNL) Residential Energy End-use Model.⁵¹ This model was criticized for the market distortion algorithm and the implicit discount rate it adopts.⁵² These features of the model relied on assumptions regarding the relationship between fuel prices and consumer purchasing decisions, and the relationship between prices and consumer willingness to accept longer payback periods. Though the court described DOE's efforts to verify the algorithm as "disappointing,"⁵³ it found the evidence sufficiently conflicting and susceptible to different interpretations so as to save DOE's interpretation from being characterized as arbitrary and capricious.⁵⁴ So long as commentators cannot show that any other method of predicting future market distortion would produce demonstrably more accurate predictions, DOE will be justified in continuing to use the ORNL model.⁵⁵

b. Significance. DOE is not free to define as insignificant what Congress regarded as significant. Therefore, energy savings that were meant to be regarded as significant, as judged against figures Congress included in the text of the Act, may not be ignored.⁵⁶

Standards must be set so that for each product type a standard results in significant conservation. The DOE may not, however, reject considerations of the overall conservation possible under an appliance efficiency program as irrelevant to the definition of significant conservation as produced by a single product type: "Cumulative savings possible from the appliance program as a whole is certainly relevant to whether the conser-

49. *Id.* at 1384.

50. *Id.*

51. *Id.* at 1385.

52. *Id.* at 1386-89. See also 47 Fed. Reg. 14,428 (1982); 48 Fed. Reg. 39, 380-383 (1983); Conyngham & Grefee, *Spot Checks of Generating Units: A Linear Programming Application*, PUB. UTIL. FORT., Nov. 5, 1981, at 46.

53. *Herrington*, 768 F.2d at 1390-91.

54. *Id.* at 1385, 1391.

55. *Id.* at 1391 ("Our decision does not . . . mean that in the future DOE may continue to rely on the market penetration algorithm and the ORNL model if further study . . . shows the model's predictions to be unreliable.")

56. *Id.* at 1377.

vation that standards for particular product type might achieve should be deemed significant."⁵⁷

A test of significance that demands a fixed amount of energy savings greater than the savings that low consumption products could ever possibly achieve, will be viewed as suspect by a reviewing court.⁵⁸

2. Technological Feasibility

The statute requires that DOE standards shall be designed to achieve the maximum improvement in energy efficiency which the Secretary determines is technologically feasible as well as economically justified.⁵⁹ The *Herrington* court concluded that a number of considerations, such as feasible efficiency levels, prototypes, foreign market design options and other factors, must be taken into account.

a. Need for a Determination of Maximum Technologically Feasible Levels. The statute on its face requires *actual determination* of maximum technologically feasible levels and specific explanations for a decision not to set standards at those levels.⁶⁰ Since an agency may not ignore a specifically mandated decision-making procedure of a statute,⁶¹ DOE must articulate clearly a description of maximum technologically feasible levels after providing interested outsiders with the opportunity to comment.⁶² As with other determinations expressly ordered by statute, this description should appear in the Federal Register, not merely in supporting technical documents.⁶³

b. Consideration of Prototypes. Unless DOE can provide substantial evidence to show that it would take more than five years to adopt the significant features of a prototype throughout a product type or class, the Department may not exclude prototypes from the determination of what is technologically feasible.⁶⁴

An exception might be made if the Department can show conclusively that it cannot weight the statutory factors of eco-

57. *Id.* at 1378.

58. *Id.* at 1380.

59. 42 U.S.C. § 6295(b)(2) (1982).

60. *Herrington*, 768 F.2d at 1391-2. *See generally* 42 U.S.C. §§ 6295(b)(2), (e), (i)(3) (1982).

61. *Herrington*, 768 F.2d at 1396.

62. *Id.* at 1394.

63. *Id.* at 1395.

64. *Id.* at 1397.

conomic justifiability for a given class of prototypes.⁶⁵ This argument was viewed skeptically by the court, however, and in future rulemaking it would only be acceptable if DOE showed why the techniques it employs to estimate the costs of commercially available technologies cannot be adapted to prototype models.⁶⁶

Similarly, DOE may rely on the inadequacies of test procedures to reject consideration of a design option only if, at the minimum, DOE "actually finds" that the test procedure cannot adequately measure the characteristics of the design option in question.⁶⁷

c. Foreign Market Design Options. DOE must include in its analysis of what efficiencies are technologically feasible, appliance designs that are available on the foreign market even though they are not currently available on the U.S. market.⁶⁸ This obligation may only be avoided if DOE can offer a thorough explanation based on record evidence why it cannot consider this class of options or any specific foreign market option.⁶⁹ Difficulties in assessing production costs and performance characteristics are not adequate reasons to exclude the whole class of foreign option designs, though particularized determinations of this kind might justify the exclusion of a particular foreign market design option.⁷⁰

d. Pay Back Periods. One means of limiting the design options considered technologically feasible is to set a maximum pay back period as one criterion of feasibility.⁷¹ In excluding design options based on pay back periods, DOE is unlikely to be able to justify categorically eliminating options with a pay back period of less than an appliance's lifetime (ranging between

65. *Id.* at 1402.

66. *Id.*

67. *Id.* at 1403.

68. Japanese refrigerators, for example, use about half as much energy as American refrigerators while retaining the self-defrosting feature. GOLDSTEIN, EFFICIENT REFRIGERATORS IN JAPAN: A COMPARATIVE SURVEY OF AMERICAN AND JAPANESE TRENDS TOWARD ENERGY CONSERVING REFRIGERATORS 1 (August 1984) (paper presented at the Third ACEEE Summer Study on Energy Efficient Buildings, Santa Cruz, California) (available from Natural Resources Defense Council).

69. *Herrington*, 768 F.2d at 1403.

70. *Id.*

71. A pay back period is the time it takes the consumer to recover the cost of the efficient design options of an appliance.

twelve and twenty-three years).⁷² So long as a design option, considering its pay back period, is cost-effective for the average consumer, a long pay back period should not exclude it from consideration.

e. Lead Times. Lead time is a calculation of the "period it would take a manufacturer to introduce [a] particular design option on all appliances covered by a standard."⁷³ Although it results in the exclusion of some design options, the court found that DOE may continue to calculate appropriate lead time so that no "significant increase in engineering staff will be required" in adopting a standard.⁷⁴

f. Choosing Among Combinations of Design Options. Different combinations of design options with varying lead times and costs to manufacturers can promise comparable gains in efficiency. Thus, in assessing the benefits and burdens of standards at a particular level of efficiency, DOE needs some theory to identify what combination of design options that achieve a given level of efficiency should be considered technologically feasible and therefore used as the basis for analysis. The DOE was vindicated by the court in using the following principles to inform its choice: "1) [i]mprovements must have a reasonable initial cost to the consumer[, and] 2) [o]nly the lowest lead time and most cost effective improvements were considered."⁷⁵ This method of ordering and structuring agency deliberation on this issue was found reasonable and may be continued.

g. Current Information. The DOE must gather current information about the design options examined in the record that closed during 1980 and must gather new information about design options that have become technologically feasible since then.⁷⁶

3. Economic Justifiability

EPCA requires that standards be economically justified and sets forth six specific factors that DOE must consider in making that

72. *Herrington*, 768 F.2d at 1404.

73. *Id.* at 1407.

74. *Id.* at 1407.

75. *Id.*

76. *Id.* at 1408-10.

determination.⁷⁷ In effect, they require a balancing of economic burdens and benefits.

a. Analysis of Economic Benefits. One facet of economic justifiability is the energy savings that can be expected to follow from the imposition of a standard.⁷⁸ If the determination of energy savings is not made accurately it can taint the calculation of economic justifiability.⁷⁹ In future rulemakings, therefore, the lawfulness of the tests applied in determining whether there will be a significant conservation of energy, will also effect the lawfulness of the calculations of economic justifiability.⁸⁰

A system for quantifying the factors to be weighed in determining economic justifiability was implicitly recommended by the court.⁸¹ Similarly, all assumptions and methodological choices must be carefully explained,⁸² including the statistical support relied upon.

b. Use of the Financial Impact Model (FIM) to Analyze Economic Burdens. The Financial Impact Model is used to predict changes that two different standards might cause in four output measures of manufacturer burden: business risk, profitability, debt/equity ratio and quick ratio.⁸³ The court did not invalidate the use of this model. It did, however, find that the model as applied by DOE was unsupported by substantial evidence.⁸⁴ In future rulemaking, the continued viability of this model will depend on whether DOE can produce more adequate evidence to support the assumption made in the model that all appliance manufacturers will finance with debt the increased investment required by standards.⁸⁵ The court sympathized with petitioners' arguments that by excluding from the model's assumptions any possibility of equity financing, DOE virtually guaranteed

77. 42 U.S.C. § 6295(d) (1982).

78. *Herrington*, 768 F.2d at 1411.

79. *Id.* at 1411-12.

80. *Id.* at 1412.

81. *Id.* at 1411-12.

82. *Id.* at 1413-19.

83. *Id.* at 1419 ("The quick ratio is a measure of a firm's ability to withstand short-term downturns in business activity. Also called the acid test ratio, it is defined as current assets, less inventory, divided by current liabilities.") (quoting 48 Fed. Reg. 39,385 n.43 (1983) to be codified at 10 C.F.R. § 430).

84. *Id.* at 1422.

85. *Id.* at 1420.

that any standard would worsen debt/equity ratios of manufacturers.⁸⁶

The court directed DOE to articulate the degree to which all four output measures may be affected by the "costs" of the "debt-financing" assumed by the model.⁸⁷ The weight that is to be given to each of the outputs in assessing the characterization of the FIM result will also need to be clarified.⁸⁸

c. Consideration of Unquantifiable Burdens. The court upheld the right of DOE to consider as burdens, in the balance of burdens and benefits to follow from standards: 1) that standards might force manufacturers to spend money on energy efficiency improvements to the detriment of expenditures on more "appropriate" investments and 2) that mandatory standards might, in the future, diminish product utility performance.⁸⁹ Neither of these burdens may be considered *dispositive* in calculating economic justifiability, but they may be factored into the calculation according to the Court's holding.⁹⁰

d. Procedure. The DOE must, in the future, allow some cross-examination of DOE employees with respect to the disputed factual issues.⁹¹ Acknowledging that the statute allows DOE to impose reasonable limits on the right of cross-examination so as to insure orderly and efficient procedure, the court, nonetheless, held that reasonable limitations could not include eliminating cross-examination altogether.⁹² It should be noted, however, it is unlikely that a court will hold that the Act requires cross-examination of every DOE employee who wrote a memorandum or spoke at an internal meeting about factual issues bearing on the rulemaking. This would subject the decision-making process of Department employees to a high level of scrutiny, which the court criticized.⁹³ Any arrangement adopted by DOE will be judged according to whether it provides "meaningful" cross-examination and is not the result of "contriving artificial interpretation."⁹⁴

86. *Id.* at 1422.

87. *Id.*

88. *Id.*

89. *Id.* at 1424.

90. *Id.* at 1425.

91. *Id.* at 1428.

92. *Id.*

93. *Id.* at 1429.

94. *Id.*

e. NEPA Requirements. For legislative proposals and other “major federal actions significantly affecting the quality of the human environment,” the National Environmental Policy Act (NEPA) of 1969 requires a detailed statement of environmental impact, generally called an Environmental Impact Statement (EIS).⁹⁵ When the Agency determines that contemplated federal action does not fall within these statutory categories, regulations promulgated by the Council on Environmental Quality generally require that an agency explain its findings of no significant impact in a “concise public document” called an “environmental assessment.”⁹⁶ The *Herrington* court held that proposed appliance efficiency standards will require at least a thorough environmental assessment and DOE will have to justify the refusal to prepare an EIS.⁹⁷ The court roundly criticized DOE for its refusal to prepare either document in the course of the 1982 and 1983 rulemaking procedures. Furthermore, future justifications for refusing to prepare an EIS may no longer rely on prior DOE reasoning. DOE may not again argue, unless they adduce additional supporting evidence, that increases and decreases in energy consumption of the same amount have equal environmental impact.⁹⁸ Similarly, they will need empirical support for future claims that market forces would prevent the preemption of state standards from having any impact or that state standards have not resulted in increased appliance efficiency and therefore absence of them will result in no impact.⁹⁹ Lastly, if DOE relies on the availability of preemption procedures as preventing significant impact it must at least discuss the state standards in effect and explain how state exemption applications will be handled.¹⁰⁰

4. Issues Upon Which the Court Refused to Rule

Issues which the court declined to decide may reemerge as contentious features in future rulemaking proceedings.

95. *Id.* at 1430.

96. *Id.*

97. *Id.* at 1433.

98. *Id.* at 1432 (“It might be that relatively slight increases in consumption would have quite dramatic environmental effects even if a corresponding decrease had very moderate effects”).

99. *Id.*

100. *Id.*

a. *Balancing of Burdens and Benefits.* The petitioners in *Herrington* claimed that, even assuming that the DOE correctly evaluated the benefits and burdens of standards, it was irrational for DOE to conclude that the benefits outweighed the burdens. Furthermore, petitioners argued that DOE failed to apply a methodology in its balancing process or, alternatively, it failed to articulate its implicit methodology. The court refused, however, to address these claims.¹⁰¹

b. *Specific Design Options.* During the rulemaking, petitioners and other commenters identified numerous energy-saving design options that, in their view, should have been considered as the basis for standards. For a variety of reasons, DOE rejected many of those suggestions, and petitioners challenged the legality of those rejections. The court in *Herrington* did not resolve this dispute over exclusion of *particular* design options, since its other findings were sufficient to require a complete review by DOE of its analysis with respect to significance and feasibility.¹⁰² In future rulemakings, this area of challenge, therefore, remains open.

c. *Reliability of Data.* The *Herrington* court did not decide whether DOE's reliance on arguably obsolete information would independently have justified overturning the rules under review. It did, however, require a new process of data collection and point out that the Congressional intent behind the usage of the term "technologically feasible" meant 'technologically feasible based on information that is reasonably current at the time the final rules are validly adopted,' *not* 'technologically feasible based on information that was reasonably current at the time DOE first attempt[ed] to promulgate final rules.'¹⁰³ Consequently, should DOE delay again in promulgating new rules, the issue of up-to-date data may emerge again as a ground upon which to challenge new standards.

101. *Id.* at 1425.

102. *Id.* at 1408.

103. *Id.* at 1409.

III. IMPACT OF THE HERRINGTON DECISION ON STATE APPLIANCE EFFICIENCY STANDARDS

A. *Likely Federal Rulemaking Timetable*

Timely DOE compliance with the 1987 and 1988 EPCA deadlines is not certain. It is always difficult, if not impossible, to provide effective sanctions for agency failure to promulgate regulations. Consequently, this statute, like other enabling statutes, lacks adequate sanctions for missed deadlines. Furthermore, since DOE has an established policy of opposing appliance efficiency standards, and a history of delay in promulgating relevant standards, it is possible that DOE may not meet either the statutory deadlines or those recommended to the Department by the court in *Herrington*.¹⁰⁴ It is unclear even when the review will begin. While the court noted that the statute requires DOE to complete consideration of the two appliance standards by December 1987 and August 1988 respectively, it did not require the review to commence at any particular time.¹⁰⁵ In the absence of a requirement for timely commencement of required review, DOE could delay initiation of the review well beyond the date suggested by the court's analysis.

The timetable would be affected further if DOE chose to exercise its powers under Section 325(c) of the Act.¹⁰⁶ This section empowers DOE to phase in final federal standards through intermediate standards over the course of five years. If DOE uses intermediate standards to phase in the program resulting from review, the final standards mandated almost a decade ago would not be complete until 1992 (for the 1982 standard) and 1993 (for the 1983 standard). On the other hand, such a choice would have the significant effect of extending beyond the term of the current Administration the latest date for full implementation of the standards, a situation which could have ramifications for the policy reflected in final standards.

B. *Preemption of State Standards*

Because the 1982 and 1983 standards are now void, preemption of all state appliance standards is suspended until new DOE standards are issued. The effect of the *Herrington* decision on pre-

104. *Id.* at 1409-10.

105. *Id.*

106. 42 U.S.C. § 6295(c) (1982).

emption of state standards once new DOE standards are issued is, however, uncertain.

The December 1982 final rules set forth procedures for states to petition for exemption of state standards from federal preemption and for manufacturers to petition for federal preemption of state rules.¹⁰⁷ The rule made a distinction between timely and untimely petitions for exemption.¹⁰⁸ State regulations covered by a petition filed before December 28, 1983 (a "timely" petition) were to remain in effect until the Secretary ruled on the petition in question. However, state regulations covered by a petition filed after the date (an "untimely" petition) were to be subject to preemption by the applicable federal standards until the Secretary issued a final rule on the state petition.

Herrington may be read to have one of two impacts on the petition procedure for exemption. One interpretation leads to the conclusion that the petition provisions remain intact. This interpretation rests on two observations. First, the procedure was codified in a subpart of the Code of Federal Regulations distinct from the final energy efficiency standards that were in question in *Herrington*.¹⁰⁹ Second, the exemption procedure is analytically distinct from an analysis of energy savings, feasibility and justifiability, which were the issues discussed in *Herrington*. A second interpretation, however, reads the *Herrington* decision as setting aside the whole of the 1982 rulemaking procedure, including its petition for exemption provisions.

If the *Herrington* decision is construed according to this latter interpretation, so as to repeal the petition process, states will then be subject to strict federal preemption once a new standard is promulgated—unless that standard sets out a new petition procedure. The preemption issue is the same whether DOE chooses to implement a final standard rule or to phase in appliance standards through intermediate standards. Like final standards, intermediate appliance standards preempt state standards governing the same product class.¹¹⁰ Thus, even under phased implementation, state appliance energy efficiency standards may be subject to

107. 49 Fed. Reg. 32,947 (1984) (to be codified at 10 C.F.R. § 430) (proposed Aug. 17, 1984).

108. *Id.* at n. 5.

109. See General Procedural Regulations, 10 C.F.R. §§ 430.41-49 (1984) and Energy Efficient Standards, 10 C.F.R. §§ 430.31-34 (1983).

110. 42 U.S.C. § 6297(b) (1982).

federal preemption upon completion of the EPCA required review in August 1987 and December 1988.

Some regulatory action is specially treated, however. The Act (Section 327(c)) specifically excludes state procurement standards of Section 327(b)(2) from preemption. Even with Federal standards in place, states and localities may, therefore, use their authority under state procurement provisions to specify the appliances that may be installed in public housing or government facilities.¹¹¹

The effect of preemption provisions on utility programs is also unclear. Electric and gas utilities in some states have instituted programs to encourage or require their customers to purchase energy-efficient appliances.¹¹² Such programs may provide rebates to customers according to the efficiency levels of appliances or they may specify minimum efficiency criteria as a condition of utility hook-up.¹¹³ Whether these programs will be preempted by new Federal standards will depend upon the nature of the individual program.¹¹⁴ Preemption will be most likely if the utility program is required by a state regulatory authority or if it operates to keep a product off the market as when minimum energy requirements are made a necessary condition of utility service.¹¹⁵

IV. ISSUES ARISING IN STATE LEGISLATIVE PROPOSALS

Even supposing that Federal standards will eventually preempt state appliance efficiency provisions, there are good reasons to give careful consideration to existing state legislation.

The reprieve from preemption may well lead to a resurgence of regulatory initiatives by the states; resulting legislation should be drafted in the light of existing precedent. The very diversity of existing state provisions also bespeaks the need to evaluate alternatives.

There are several reasons states may experience a rapid reemergence of interest in state appliance efficiency legislation.

111. J. FANG, S. BALISTOCKY & A. SCHAEFLER, ISSUES IN FEDERAL PREEMPTION OF STATE APPLIANCE ENERGY-EFFICIENCY REGULATIONS 4.3 (1982) (Pacific Northwest Laboratory, Richland, Washington) [hereinafter cited as ISSUES IN FEDERAL PREEMPTION].

112. See also Stearns, *Energy Savings in Residential Buildings: The Role of Investor-Owned Utilities*, 11 COLUM. J. ENVTL. L. 261 (1986).

113. ISSUES IN FEDERAL PREEMPTION, *supra* note 111, at 4.3.

114. *Id.*

115. *Id.* at 4.4.

In 1985 and 1986 alone, three state legislatures have been presented with proposals to introduce the concept of efficiency standards or to add to existing provisions.¹¹⁶ *Herrington* may well be seen by supporters of these bills as an invitation to pursue their course of action.¹¹⁷

States or interest groups within states may also see state legislation as a way of affecting the outcome of the federal rulemaking procedure. Prompt enactment of state standards, for example, would give states several years to develop data describing the economic effect of given standards: data which would be useful in evaluating federal conclusions as to the cost-effectiveness of potential standards. Furthermore, by requiring manufacturers to retool in order to comply with state standards, states can create a vested interest on the part of manufacturers to have similar standards retained by the federal authorities.

The following pages analyze existing state provisions regarding significant issues upon which every state legislature must make choices if it is to regulate appliance efficiency, *e.g.*, what appliances should be regulated, by whom, according to what criteria, and subject to what enforcement powers.

A. *What Appliances to Regulate*

An initial choice must be made among coverage designs. A statute can enumerate those appliances to be covered by standards, it can empower an agency to regulate whatever appliances meet a particular set of criteria, or it can adopt a combination of these alternatives.

New York legislation adopts the first design, providing specifically for the regulation of lighting in buildings,¹¹⁸ residential and commercial hot water heaters,¹¹⁹ refrigerators, refrigera-

116. *See, e.g.*, Florida: H.B. 1163 (1985), S.B. 275 (1985); OREGON: S.B. 626 (1985) (standards for freezers, refrigerators and refrigerator-freezers); TEXAS: S.B. 896 (efficiency standards to be incorporated into New Building Construction Code); MASSACHUSETTS: A Bill to Promote Energy Efficiency and Energy Conservation by Establishing Minimum Energy Efficiency Standards for New Appliances Sold in the Commonwealth (1986) (Available from L. Alexander, Massachusetts House of Representatives).

117. *See* DIVISION OF POLICY ANALYSIS AND PLANNING, N.Y. STATE ENERGY OFFICE, MEETING THE CHALLENGE: AN ANALYSIS OF ELECTRICITY SUPPLY OPTIONS FOR NEW YORK STATE 14 (Dec. 1985).

118. N.Y. ENERGY LAW §§ 8-103-107 (Consol. 1984).

119. N.Y. ENERGY LAW § 16-108 (Consol. 1984).

tor/freezers and freezers;¹²⁰ electric dishwashers;¹²¹ television receivers;¹²² gas appliances equipped with pilot lights;¹²³ and air conditioners and heat pumps.¹²⁴

California legislation adopts the last design. Gas appliances equipped with pilot lights and swimming pool heaters are provided for specifically.¹²⁵ In addition, however, an enabling provision empowers the Commissioner to set standards with respect to appliances "whose use, as determined by the commission, requires a significant amount of energy on a statewide basis."¹²⁶

It is not surprising that both these approaches have led to the regulation of those products (or subclasses thereof) given priority standing under Federal appliance efficiency law.¹²⁷ These are the appliances which account for about one-half of residential energy consumption,¹²⁸ and which offer the greatest prospect of energy savings through technological improvements in efficiency.¹²⁹

B. Agency in Charge

How a state chooses to administer an appliance efficiency scheme will be influenced by the approach, or combination of approaches, to regulation taken.

An approach which ensures that efficient appliances are installed in new and newly renovated buildings is to provide for appliance efficiency standards under state building codes.¹³⁰

120. N.Y. ENERGY LAW § 16-110 (Consol. 1984).

121. N.Y. ENERGY LAW § 16-112 (Consol. 1984).

122. N.Y. ENERGY LAW § 16-114 (Consol. 1984).

123. N.Y. ENERGY LAW § 16-116 (Consol. 1984) (including, *e.g.*, furnaces, air conditioners, heaters, refrigerators, stoves, ranges, dishwashers, clothes dryers and clothes washers).

124. N.Y. ENERGY LAW § 16-118 (Consol. 1984).

125. CAL. PUB. RES. CODE § 25960 (appliances with pilot lights), § 25960.5 (swimming pool heaters) (West 1985).

126. CAL. PUB. RES. CODE § 25402(c)(1) (West 1985).

127. 42 U.S.C. § 6295(g) (1982). See *supra* note 22.

128. GELLER, *supra* note 2, at 1.

129. Appliance efficiency standards should be distinguished from standards set on health and safety grounds. The latter may have efficiency ramifications, however, and should, therefore, be coordinated with appliance efficiency controls. See, *e.g.*, MINN. STAT. ANN. §§ 116.J.27, 116.J.30 (West 1985) (health and safety standards for weatherstripping, caulking, storm windows, and storm door energy efficiency).

130. GELLER, *supra* note 2, at 2. ("most states have minimum efficiency requirements for air conditioners in their building codes"); GELLER, *supra* note 1, at 27 ("nearly all states have adopted building codes with equipment efficiency requirements based on [ASHRAE] standards"). See, *e.g.*, FLA. STAT. ANN. § 553.901-553.912 (West 1984); MICH. COMP. LAWS ANN. § 125.1513a (West 1985).

Building code provisions frequently, however, do not tackle the problem of increasing the efficiency of appliances used in existing building stock. Frequently, therefore, states will also wish to control the manufacture, sale and purchase of inefficient appliances.¹³¹ A third approach, used in Minnesota and Tennessee, takes special account of the role state purchasing can have in increasing the use of efficient appliances.¹³² Because such provisions are not subject to Federal preemption their use may be particularly attractive.¹³³

Each of these approaches may suggest a particularly appropriate body in which to invest administrative authority. Four major schemes of administration currently in use by states are described below.

1. Independent Commission

Especially where an administrative agency is involved in setting standards as well as administering them, an independent commission offers the advantage of ensuring that the persons involved have particular expertise and represent varied constituencies. In California, for example, an independent commission composed of five members has been established.¹³⁴ Each member of the State Energy Resources Conservation and Development Commission must meet different statutory qualifications: one must be qualified in engineering or physical science with a knowledge of energy supply or conservation systems; one must be an attorney with administrative law experience; one must have a background in the field of environmental protection or the study of ecological systems; one must be an economist versed in natural resource management; and one must be a representative of the "public at large."¹³⁵ The Secretary of the Resources Agency, within which the Commission is placed, and the President of the Public Utilities Commission are designated as *ex officio*, non-voting members.¹³⁶

In Michigan the State Construction Code Commission, although it is located within the Department of Labor, exercises

131. See, e.g., ARIZ. REV. STAT. ANN. § 40-1202-1205 (1985); CAL. PUB. RES. CODE § 25960-25968 (West 1985).

132. MINN. STAT. ANN. § 116J.19(9) (West 1985); TENN. CODE ANN. § 12-3-604 (1985).

133. See *supra* text accompanying note 111.

134. CAL. PUB. RES. CODE § 25200-25202 (West 1985).

135. *Id.* at § 25201.

136. *Id.* at § 25202.

its statutory functions independent of that Department, except that budgeting, personnel and procurement functions of the Commission are performed by the Department of Labor.¹³⁷ That Commission is to consist of the state fire marshal (or his designee); the chairpersons of the barrier free design board, the electrical administrative board, the state plumbing board, the board of mechanical rules; and twelve residents of the state to be appointed by the governor with the advice and consent of the Senate. Each of the twelve residents appointed shall be persons with expertise in one of the areas enumerated in the statute.¹³⁸

Proposed legislation in Texas would vest in the State Purchasing and General Services Commission the power to set energy efficiency standards for new building construction. Advisory and review powers would, however, lie with an independent committee made up of representatives from engineering, architecture, construction, local building code administration and the general public.¹³⁹

2. Public Utility Commissions

The bodies in charge of public utility regulation are a particular category of independent commission. Their established relationship with energy issues affords them special expertise and their monopoly status places them in a unique position to control consumer use of inefficient gas appliances. Thus, in Wisconsin, the Public Service Commission administers a provision which prohibits utilities from installing or connecting to the distribution system devices which, under Public Service Commission rules, constitute "non-essential use[s] of natural gas."¹⁴⁰ The Department of Industry, Labor and Human Relations meanwhile administers a complimentary set of regulations that apply to the sales, distribution and installation of new gas appliances.¹⁴¹

Arizona empowers its Corporation Commission to administer a prohibition on the sale and installation of gas appliances that do not have efficient intermittent ignition devices.¹⁴² It is further em-

137. MICH. COMP. LAWS ANN. § 125.1503(3)(4) (West 1985).

138. *Id.* at § 125.1503, Sec. 3(1) (West 1985).

139. S.B. 896 (1985) (Texas) (sponsored by Sen. Uribe). Both the regular and the special Senate sessions adjourned in May 1985 without taking final action on the Bill.

140. WIS. STAT. ANN. § 196.97 (West 1985).

141. WIS. STAT. ANN. § 101.655 (West 1985).

142. ARIZ. REV. STAT. ANN. § 40-101, 40-1201 (1985).

powered, in cooperation with affected industry and consumer representatives, to develop specifications for ignition device certification.¹⁴³ Similarly, in Connecticut, the Department of Public Utility Control regulates the use of devices designed to provide illumination or heat swimming pools through the use of natural gas.¹⁴⁴

3. Existing State Agency

Most states opt to have an existing state agency administer their appliance efficiency standards program. This design has the advantage of relying on existing agency resources and inter-agency cooperation. In the political climate of the 1980's, the political acceptability of new legislation may depend upon its ability to be implemented without augmenting bureaucracy. Though logically it may seem that the state energy office or its equivalent in any given state might be the most appropriate agency in which to place such powers, various other agencies have administered appliance efficiency regulation.¹⁴⁵

4. Local Communities Regulation

It may be necessary or desirable to secure a continuing role for local community regulations especially where a state seeks to regulate appliance efficiency through the procurement policies of political subdivisions, or through building construction requirements.

New York, for example, requires that municipalities be allowed to enforce local building regulations pertaining to lighting standards for existing buildings, so long as local regulation is not inconsistent with state lighting efficiency standards.¹⁴⁶ Similarly, Tennessee allows political subdivisions to adopt energy efficiency standards for products to be procured by the political subdivi-

143. ARIZ. REV. STAT. ANN. § 40-1203 (1985).

144. CONN. GEN. STAT. ANN. § 16a-37 (West 1985).

145. *E.g.*, MASS. ANN. LAWS ch. 94, §§ 314-318 (Michie/Law Co-op. 1975) (The Executive Office of Consumer Affairs administers an appliance efficiency labelling and testing scheme); MO. ANN. STAT. § 640.150 (Vernon 1979) (The Department of Natural Resources administers a program of energy efficiency standards for agricultural and industrial energy use and for new and existing buildings); WIS. STAT. ANN. § 101.655 (West 1985) (The Department of Industry, Labor and Human Relations administers provisions prohibiting the use of gas pilot lights).

146. N.Y. ENERGY LAW §§ 8-106, 8-107 (Consol. 1984).

sion, as long as such standards are more stringent than those established by the board of standards.¹⁴⁷

The important role which local regulation can play is perhaps best exemplified in Texas, where an absence of state provisions regulating appliance efficiency has left the area wholly to local regulation. As a consequence, forty-nine local building codes include various energy efficiency standards for a variety of appliances.¹⁴⁸

C. *Choice of Standards*

Not only must decisions be made regarding the appropriate type of standard to use—prescriptive or performance—but a major policy decision must also be made regarding whether to legislate applicable standards or whether to merely empower an authority to develop standards by regulation. The former course of action offers the decided advantage of avoiding the delay inherent in the rule-making process and often exacerbated by subsequent court challenges of the rule. On the other hand, it is often harder to rally the political consensus necessary for passage of a law when it incorporates detailed requirements which promise to be enforceable within a statutory time-table.

1. Prescriptive Standards

Prescriptive standards are formulated as specific requirements. A common standard of this type is a ban on the manufacture, installation, sale, etc. of a given class of appliances. Prescriptive standards may also, however, require that a particular technology (*e.g.*, resistance heat switch) or a given set of information (*e.g.*, efficiency labels, fact sheets) accompany an appliance. Prescriptive standards of the first sort are applied to pilot lights, gas lamps, television receivers and appliances equipped with electrical resistance heat units.

Frequent candidates for prescriptive regulation are gas appliances traditionally lighted by a pilot light. With advances in technology the use of continuously operated or lighted pilot lights to ignite gas appliances can be both wasteful and unnecessary. To

147. TENN. CODE ANN. § 12-3-611 (1985).

148. For a list of localities for which Texas submitted a timely petition to DOE for exemption from preemption of standards, *see* 49 Fed. Reg. 32,959, 32,983 (1984).

replace pilot lights with intermittent ignition devices can, therefore, be an object of conservation regulation.¹⁴⁹

Prohibition of the use of pilot lighted appliances can be coupled with the positive requirements of certification. Arizona and California, for example, provide that no new residential-type gas appliances equipped with a pilot light shall be sold or installed in the state after an alternate means has been certified by the regulating body.¹⁵⁰ Considerations to be taken into account in developing specifications for certification are generally written into the statute.¹⁵¹

Residential gas appliances affected by pilot light regulation can include central furnaces, heaters, refrigerators, stoves, ranges, dishwashers, dryers, air conditioners, decorative fireplaces, swimming pool heaters, etc.¹⁵²

Legislators may wish to consider providing exceptions to exclude application of prescription standards under some circumstances. Candidates for exclusion from pilot light prohibitions include gas appliances installed in mobile or modular homes,¹⁵³

149. GELLER, *supra* note 2, at 14 (citing DeWerth & Loria, *Upgrading Seasonal Efficiency of Gas Heating Systems*, GR1-81-0006, report prepared by the American Gas Association Laboratories, Cleveland, Ohio for the Gas Research Institute, Chicago, Illinois) (Dec. 1981).

"While tests of electronic intermittent ignition devices . . . have shown significant energy savings during the non-heating season and during the heating season in milder climates, there may not be significant energy savings during the heating season in colder climates." *Id.*

150. ARIZ. REV. STAT. ANN. § 40-1202 (1985); CAL. PUB. RES. CODE § 25960 (West 1985). *See also* WIS. STAT. ANN. § 101.655(2) (West 1985).

151. ARIZ. REV. STAT. ANN. § 40-1203 (1985); CAL. PUB. RES. CODE § 25961 (West 1985); WIS. STAT. ANN. § 101.655(3) (West 1985) (all requiring that specifications for certification shall be developed so as to result in the conservation of primary energy resources, shall include provisions necessary for public health and safety and shall give due consideration to the initial costs, including installation and maintenance costs imposed upon the consumer).

152. *See, e.g.*, MICH. COMP. LAWS ANN. § 125.1513a(2) (West 1985) (prohibiting pilot lights in specified central furnaces, clothes dryers and household cooking appliances); HAWAII REV. STAT. § 196-5(e) (1984) (defining "gas appliance," as used in the pilot light prohibition provision, to include residential heaters, refrigerators, stoves, ranges, dishwashers, dryers, air conditioners, decorative fireplaces "or other similar devices"); CAL. PUB. RES. CODE § 25960.5 (West 1985) (specially prohibiting after December 1, 1984, the sale of swimming pool heaters that are not equipped with an intermittent ignition device or designed to burn only liquified petroleum gas).

153. MICH. COMP. LAWS ANN. § 125.1513a(3) (West 1985); *but see* Ariz. Op. Atty. Gen. No. 180-2 (prohibition on sale of new residential-type gas appliances equipped with pilot lights applies to furnaces sold as an integral part of a new or used mobile or modular home).

portable gas camping lanterns,¹⁵⁴ stoves or ranges which contain separate sections specifically designed to provide space heating;¹⁵⁵ and appliances which do not contain any electrical component.¹⁵⁶ Hawaii's law includes an interesting exemption which shows sensitivity to local conditions. The application of pilot light restrictions are not to apply to persons living in areas where electricity service is unreliable or non-existent.¹⁵⁷

Other prescriptive standards aimed at conserving gas apply to decorative lamps or lighting fixtures operated by natural gas or synthetic natural gas.¹⁵⁸ To this end, Wisconsin adopts a broader mechanism that prohibits the installation or connection of devices which constitute "a non-essential use of natural gas," leaving to the public service commission the discretion to determine what appliances are covered by that definition.¹⁵⁹

Analogous to the use of gas in pilot lights is the continuous use of electricity in television receivers designed to insure immediate reception upon being energized. The use of receivers manufactured with this design was prohibited in New York after January 1, 1977.¹⁶⁰

Prescription standards have also been applied to appliances which are equipped with automatically energized electrical resistance heat units.¹⁶¹ Refrigerators, freezers and electric dishwashers can fall into this category. In refrigerators and freezers, resistance heating units are designed to prevent condensation on the appliance jackets. In dishwashers, they are generally triggered at the end of the rinse cycle to speed the drying cycle. Such heating units consume significant amounts of energy. Hence, New York has proscribed the sale or advertisement of refrigerators, freezers or dishwashers equipped with them, unless the appliance possesses an "easily accessible manually operated electrical switch" capable of terminating the heating.¹⁶² The

154. See MICH. COMP. LAWS ANN. § 429.351(1)(b) (West 1985) (excluding portable gas camp lanterns from the definition of decorative gas lamp).

155. N.Y. ENERGY LAW § 16-116(2)(a)(b) (Consol. 1984).

156. *Id.*

157. HAWAII REV. STAT. § 196-5(d) (1984).

158. OHIO REV. CODE ANN. § 1301.17 (Baldwin 1978); MINN. STAT. ANN. § 116J.19(6) (West 1985).

159. WIS. STAT. ANN. § 196.97 (West 1985).

160. N.Y. ENERGY LAW § 16-114 (Consol. 1984).

161. See N.Y. ENERGY LAW § 16-110, 16-112 (Consol. 1984).

162. *Id.*

switch must be clearly marked and explained in the instruction booklet, which is, by statute, required to accompany the appliance. The explanation, furthermore, must be in terms of the amount of energy that can be saved by the use of the switch.¹⁶³

Labelling requirements which give either comparative energy consumption statistics or just the energy consumption statistics for a particular appliance can be justified by general policies supporting the increase of information to, and the promotion of rational self-selection by consumers. Massachusetts, for example, which does not impose efficiency standards on either the manufacture or sale of appliances, does empower the Secretary of the Office of Consumer Affairs to require that appliances be labelled with numerical measures that reflect the relative efficiencies of all appliances within a given class or sub-class, according to a standardized computation procedure.¹⁶⁴

Where performance standards are in place,¹⁶⁵ labelling can also promote an appreciation of comparative energy efficiency among appliance designs. Thus in New York, air conditioners and heat pumps which are subject to performance standards, must also bear a label stating: a) their cooling capacity rating, b) their power rating, and c) their energy efficiency ratio.¹⁶⁶

The information to be included on labels should be produced by standardized computation procedures. Such testing procedures can be adopted by regulations, through the exercise of delegated authority,¹⁶⁷ or can incorporate by reference existing methodologies.¹⁶⁸

Another approach to increasing the information available to consumers is to require that the manufacturers include within a new appliance package fact sheets which give information about a particular appliance. Alternatively, regulations can place an onus upon a seller to produce for a potential purchaser a fact sheet giving information about the appliance to be purchased. As noted above, New York requires fact sheets to accompany electric dishwashers, refrigerators and freezers sold with resistance heat

163. *Id.*

164. MASS. ANN. LAWS ch. 94, §§ 315-316 (Michie/Law. Co-op. 1975).

165. See *infra* notes 171-88 and accompanying text.

166. N.Y. ENERGY LAW § 16-118(2)(a) (Consol. 1984).

167. MASS. ANN. LAWS ch. 94, §§ 315-316 (Michie/Law. Co-op. 1975).

168. WIS. STAT. ANN. § 101.655(2) (West 1985).

switches.¹⁶⁹ Also under New York law, fact sheet requirements complement labelling provisions with respect to air conditioners and heat pumps. Potential purchasers of these appliances must be shown a fact sheet describing the performance of the appliance on energy use criteria, *e.g.*, its seasonal energy efficiency ratio and its cooling capacity rating.¹⁷⁰

2. Performance Standards

Standards formulated in terms of performance objectives for classes or subclasses of appliances leave open the technical means by which such standards should be achieved. Usually such standards will constitute the minimum standards to be applied subject to even stronger standards that might be devised by the administering body. State statutes may incorporate performance standards developed by private associations, set statutory performance standards of the legislators' own design or delegate responsibility for making standards.

Private associations which make available suggested performance standards include: the American National Standards Institute (ANSI); the American Gas Association Laboratories; Underwriters Laboratories; the Council of American Building Officials; and the American Society of Heating, Refrigeration and Air Conditioning Engineers, Inc. (ASHRAE).

These standards, sometimes called consensus standards, have no mandatory enforcement provisions and are not in themselves legally binding. When incorporated by reference in, or adopted into state or local government ordinances, they do, however, become a legal requirement.¹⁷¹

ASHRAE Standard 90 is one of those standards which has been widely adopted in the efficiency provisions of state building codes.¹⁷² It describes methods for designing and constructing new energy-efficient buildings, as well as the size and types of air conditioners, water heaters and furnaces that the builder or de-

169. N.Y. ENERGY LAW §§ 16-110, 16-112 (Consol. 1984).

170. N.Y. ENERGY LAW § 16-118(2)(b) (Consol. 1984).

171. *See* MICH. COMP. LAWS ANN. § 125.1504(2) (West 1985).

172. *E.g.*, HAWAII REV. STAT. § 196-6 (1984) (adopting ASHRAE 90 Standard for new storage hot water heaters); Texas local building codes also use ASHRAE Standard 90-75 as their basis. 49 Fed. Reg. 32,965 (1984).

signer should use.¹⁷³ Approximately forty-eight states received funds from DOE to adopt mandatory thermal efficiency standards under the Energy Policy and Conservation Act.¹⁷⁴ Most of these adopted ASHRAE Standard 90 or some version of it.¹⁷⁵

States are more likely to rely on standards of their own design rather than adopting a consensus standard if they seek to make applicable minimum standards more stringent than existing consensus standards. Standards designed by the legislators may be incorporated into the text of the statute or legislators may prefer to delegate the task of standard making.¹⁷⁶ In the latter case, the statute may or may not require that the discretion thus granted be exercised within statutory guidelines.¹⁷⁷ Even where state agencies are delegated the task of standards making, a statute may require reference to a consensus standard or may require that the testing method used in developing consensus standards be adopted.¹⁷⁸

To guide the discretion of state authorities in setting standards, a state statute may require that a variety of criteria be considered. California, for example, requires that the commission set minimal levels of operating efficiency based on "feasible and attainable efficiencies or feasible improved efficiencies which will reduce the electrical energy consumption growth rate."¹⁷⁹

Cost-effectiveness is another criterion suggested as a suitable guide to choosing standards.¹⁸⁰ Requiring that this criterion be considered, however, begs the questions: for whom must the standard chosen be cost-effective, and over what time period is the cost-effectiveness to be calculated? States answer the first question in varying ways. A bill recently considered by the Florida legislature was introduced as requiring standards that were

173. PACIFIC NORTHWEST LABORATORY, RICHLAND, WASHINGTON, ISSUES IN FEDERAL PREEMPTION OF STATE APPLIANCE ENERGY-EFFICIENCY REGULATIONS 4.2 (Dec. 1982) (prepared for the U.S. Department of Energy under Contract DE-AC06-76RLO-1830).

174. *Id.*

175. *Id.*

176. Compare N.Y. ENERGY LAW § 16-118(4) (Consol. 1984) with CAL. PUB. RES. CODE § 25402(c)(1) (West 1985).

177. See *infra* notes 179-185 and accompanying text.

178. See WIS. STAT. ANN. § 101.655(2) (West 1985).

179. CAL. PUB. RES. CODE § 25402(c)(1) (West 1984).

180. Or. (1985) S.B. 626, § 3(2) ("in determining whether a standard is economically justified, the department shall use the estimated life-cycle costs to Oregon's consumers over the lifetime of the appliance. No standard may be adopted that results in additional estimated total costs to the consumer over the lifetime of the appliance").

cost effective for "every individual" in the state. Amendments reduced the onus to a requirement that standards be cost-effective for "the majority" of customers within the state.¹⁸¹ In California, by contrast, the cost-effectiveness of a proposed standard is to be judged by whether the standard adds to the "consumer's total costs."¹⁸²

The time period over which cost-effectiveness is calculated can make a substantial difference in the range of appliance designs considered efficient, as illustrated by the analogous ability of DOE to eliminate a wide range of appliances by using a restrictive definition of pay-back period as one criterion of feasibility.¹⁸³ Cost-effectiveness calculated over the life-cycle of an appliance in economic terms is the optimal calculation. Over this period, however, consumers who buy on credit may experience an increase in their net energy expenses while repaying their loan, even though they stand to recoup that expenditure in saved energy costs over the life of the appliance. Recognizing this drawback for consumers, a recent study suggests that calculations should be made on a payback period that is sensitive to consumer experience. This would entail a requirement that the *average* pay back period for all the individual efficiency measures incorporated in an appliance be commensurate with the length of time over which most appliances are bought on credit, generally less than three years.¹⁸⁴

The methodology employed in testing appliances for efficiency and in calculating the criteria of efficiency can make a great difference in the results obtained.¹⁸⁵ Legislators, therefore, should not leave the choice of such methodologies wholly to the discretion of administrators. One option is to adopt by reference the methodology used by the developers of consensus standards.¹⁸⁶

Any one of these approaches should be complemented by a provision for the regular review of standards by authorities within the state.¹⁸⁷ The technological possibilities for increasing energy

181. FL. (1985) H.B. 1163.

182. CAL. PUB. RES. CODE § 25404(c)(1) (West 1984).

183. See *supra* notes 71 and 72 and accompanying text.

184. Rollin and Beyea, *U.S. Appliance Efficiency Standards*, ENERGY POLICY 425, 433 (Oct. 1985).

185. GELLER, *supra* note 1 at 5.

186. See WIS. STAT. ANN. § 101.655(2) (West 1985).

187. Recent bills have been sensitive to this need. See Texas S.B. 896 (1985), Sec. 4(c) (review and revision at least every five years); Oregon S.B. 626 (1985) Sec. 5(1) (review every four years). See also Florida H.B. 1163 (1985) (amendment to prevent changes more

conservation are continually improving, and it is important that statutes encourage the incorporation of the latest technological advances.¹⁸⁸

3. Performance Criteria

Performance standards are generally set in terms of performance criteria which measure the minimum efficiency required of a regulated appliance or class of appliances. The applicable criteria differ according to the appliance at issue. The following discussion highlights the criteria most often applied to frequently regulated appliances and touches on some of the technical modifications that can improve these measures.

Performance standards for air conditioners are generally expressed in requirements for a certain energy efficiency ratio (EER); the ratio between the cooling capacity of the air conditioner in thermal units per hour (BTU/hr) and the electrical input in watts. Seasonal energy efficiency ratios (SEER), a variation on the EER, can also serve as a criterion.¹⁸⁹ Design modifications and the use of better components can achieve an improved EER and SEER in air conditioners. Larger condensers and evaporator coils; more efficient motors, improved compression controls and the use of heat pumps are recent foci of technological innovation.¹⁹⁰

In gas water heaters, coupling a hot water tank to a condensing furnace can eliminate flue heat losses and increase recovery efficiency. Alternatively, new developments in combustion (sealed combustion or pulse combustion) and more efficient venting designs can improve the efficiency of these appliances according to performance criteria.¹⁹¹ Electric water heating is made more efficient by heat pumps, condensers in the storage tank and additional insulation.¹⁹²

frequently than every five years was defeated in mark-up session by the Energy Subcommittee of the House Natural Resources Committee. As approved by the Energy Subcommittee, the bill permitted changes at two to seven year intervals.) *But see* CAL. PUB. RES. CODE § 25402(c)(3) (West 1985) (No increase or decrease in standards shall take effect for five years after a standard is adopted, unless the commission adopts other cost-effective measures for that appliance.)

188. *See* GELLER, *supra* note 2.

189. *See* 44 Fed. Reg. 76,700 (1979).

190. GELLER, *supra* note 1 at 9.

191. *Id.* at 7.

192. *Id.*

Performance standards for hot water heaters are generally set in terms of limits on their *stand-by loss*, *i.e.*, the amount of heat lost through the tank walls and insulation, and requirements regarding their *recovery efficiency*, *i.e.*, the ratio of heat absorbed by the water to the heat delivered to the appliance in the process of raising the inlet water temperature to the final water temperature.

Oil and gas furnaces are regulated by percentage of combustion efficiency. Mechanisms by which the heat in exhaust gases is recaptured by condensation improve this efficiency measure.¹⁹³

The efficiency of light bulbs and fixtures is measured in the rate of light output (lumens) per unit of power consumed (watts). Compact fluorescents and screw-in "circlate" fluorescent bulbs are among the efficient technological developments regarding lighting appliances.¹⁹⁴

The *energy factor* of refrigerators and freezers or combinations thereof is the usual criterion by which their efficiency is measured. The energy factor is the corrected volume¹⁹⁵ of the appliance divided by the daily electricity consumption, under specified test conditions.

D. Enforcement Provisions

As with other aspects of appliance efficiency regulation, states vary widely on the enforcement provisions included in state statutes. Civil penalties,¹⁹⁶ injunctive relief¹⁹⁷ and misdemeanor ac-

193. *Id.* at 7.

194. *Id.* at 9.

195. Corrected volume refrigerator space plus 1.63 times the freezer space for refrigerator/freezers and 1.73 times the freezer space for freezers.

196. *See* ARIZ. REV. STAT. ANN. § 40-1207 (1985) (civil penalty not to exceed \$300 for each violation; action may be brought by Attorney General, or any county or city attorney in any court of competent jurisdiction); CAL. PUB. RES. COE § 25967 (West 1985) (civil penalty not to exceed \$2,500 for each violation; action may be brought by Attorney General, any district attorney, county counsel or city attorney in any court of competent jurisdiction); MINN. STAT. ANN. § 116J.30, subdiv. 3 (West 1985) (civil penalty of not more than \$10,000 for each violation); N.Y. ENERGY LAW § 8-106(3)(b) (civil penalty of up to \$1,000 for failure to submit a certification statement or failure to bring a building or leased premises into compliance), § 6-108(5) (fine not to exceed \$1,000 for violation of hot water heater efficiency standards), § 16-110 (fine not more than \$250 for violation of refrigerator freezer provisions), *see also* § 16-112, 16-116 (Consol. 1984).

197. ARIZ. REV. STAT. ANN. § 40-1206 (1985); CAL. PUB. RES. CODE § 25966 (West 1985); MINN. STAT. ANN. § 116J.30 subdiv. 2 (West 1985); N.Y. ENERGY LAW § 8-106(3)(b) (Consol. 1984).

tion¹⁹⁸ are the three enforcement mechanisms most commonly adopted.

The imposition of a civil penalty obviates the need for adherence to the strictures of the criminal law process. One issue in the effective use of such a sanction is how to use the money paid as a consequence of such penalties. The standard practice is to have it paid to general funds.¹⁹⁹ Earmarking at least a portion of the money collected is a means of subsidizing the enforcement work of a responsible agency. Arizona and California, for example, have adopted provisions which direct the state treasurer to reimburse from collected penalties the reasonable expenses of investigation and prosecution by the enforcement agency.²⁰⁰ There was clearly a body of opinion which feared that frivolous actions could be pursued under its efficiency law. To protect against such activity, the Arizona law also provides that where:

a civil action is brought by any unit of government and the defendant is proven innocent, the defendant shall be given the right to reclaim all court costs and attorney's fees from the complaining unit of government.²⁰¹

Injunctive relief may allow a court of competent jurisdiction to make such orders as may be necessary, to compel compliance with a statutory provision, or to restore money or property acquired as a consequence of a violation. In Arizona and California, the orders which the court may make include the appointment of a receiver.²⁰² Generally, actions for injunctive relief cannot be

198. HAWAII REV. STAT. § 196-6 (1984) (fine of not less than \$50 or more than \$500 consecutively imposed for violation of hot water heater provision); MICH. COMP. LAWS ANN. § 429.357 (West 1985) (violation of appliance labeling provisions is a misdemeanor); MINN. STAT. ANN. § 116J.30 subd. 1 (West 1985) (violation of *inter alia* rules containing energy efficiency standards for existing residences is a misdemeanor; each day of violation constitutes a separate offense); N.H. REV. STAT. ANN. § 155-D:6 (III) (violation of *inter alia* thermal and lighting standards is a misdemeanor); OHIO REV. CODE ANN. § 1301.17 (Baldwin 1985) (violation of prohibition on decorative natural gas lamps is a "minor misdemeanor.")

199. See MINN. STAT. ANN. § 116J.30 subd. 3 (West 1985) (penalties paid to general fund in state treasury); N.Y. ENERGY LAW § 8-106(3)(b) (Consol. 1984) (penalties paid into state treasury to the credit of the general fund).

200. See ARIZ. REV. STAT. ANN. § 40-1207(C) (1985); CAL. PUB. RES. CODE § 25967(c) (West 1985) (where action is brought at the request of the Commission, its reasonable expenses shall be paid out of assessed penalties).

201. ARIZ. REV. STAT. ANN. § 40-1207(B) (1985).

202. ARIZ. REV. STAT. ANN. § 40-1206(A) (1985); CAL. PUB. RES. CODE § 25966 (West 1985).

initiated by private citizens; they must be brought by competent government counsel.

Criminal penalties are more traditional sanctions than civil penalties and are still levied by some states for violation of appliance standard provisions. Such offenses are limited to characterization as misdemeanors.²⁰³ In most states, criminal codes will define the penalty that attaches to the commission of a misdemeanor, though an appliance standard law may specify a particular penalty.²⁰⁴

Under some circumstances, contract provisions can serve an enforcement role. In Tennessee, where appliance efficiency is regulated through restrictions on state purchasing power, enforcement is encouraged by giving third (aggrieved) parties the right to void a contract between a seller and a state purchaser for the purchase of commodities which are less efficient than those available for purchase from the aggrieved party.²⁰⁵

An alternative to stipulating enforcement mechanisms within the text of the statute is to delegate, in the states which permit such delegation, the responsibility for designing the enforcement system. Connecticut law delegates such power to its Department of Public Utility Control with respect to the enforcement of natural gas lighting and heating prescriptions.²⁰⁶ Similarly, New Jersey includes enforcement of the state energy conservation program as one of the responsibilities delegated to the Commissioner of the Department of Energy.²⁰⁷

Legal compliance can also be encouraged through mechanisms aimed at preventing violations before the courts are brought into play. Where appliance standards are part of building requirements, for example, inspection provisions can be a key feature of deterrence, as well as a needed tool in the prosecution of offenders.²⁰⁸ In California, powers of inspection are also given, under gas appliance provisions, to the State Energy Resources Conservation and Development Commission.²⁰⁹ These powers are to be

203. See *supra* note 198.

204. HAWAII REV. STAT. § 196-6(C) (1984) (fine of not less than \$50 or more than \$500, and all fines shall be imposed consecutively).

205. TENN. CODE ANN. § 12-3-608 (1985).

206. CONN. GEN. STAT. ANN. § 16a-37(e) (West 1985).

207. N.J. REV. STAT. § 52.27F-11 (1984).

208. See MINN. STAT. ANN. § 116.27 subd. 1 (West 1985); FLA. STAT. ANN. 4553.908 (1984).

209. CAL. PUB. RES. CODE §§ 25965, 25968 (West 1985).

exercised in making periodic inspections of manufacturers and distributors of gas appliances, retail outlets handling gas appliances and gas appliances that have been or are to be installed by contractors or builders at building sites.²¹⁰

The ability to deny building permits in the event of non-compliance with efficiency requirements is another administrative technique of enforcement.²¹¹

V. CONCLUSION

Public interest in energy conservation can be served by increasing the efficiency of appliances. Appliance efficiency standards can, in turn, ensure that technological developments are reflected in the marketplace. So long as the criteria for establishing standards are sensitive to the balance which must be achieved between the public interest in energy conservation and the consumer's interest in minimizing costs, such regulation need not be a hardship on consumers.

In all likelihood, such regulation will eventually take place at the federal level. The congressional intent that standards be issued by the Department of Energy is clear from the provisions of EPCA, and manufacturers with interstate businesses have a strong interest in uniform standards. There is, nevertheless, energy to be saved in the interim. Furthermore, state law can play a large role in influencing what federal standards will eventually look like and, to the extent that provisions are made for exemption from federal preemption, state law may continue to be a force for improving the efficiency of appliances.

210. *Id.*

211. CAL. PUB. RES. CODE § 25402(e)(1) (West 1985); FLA. STAT. § 553.907 (1984); N.H. REV. STAT. ANN. § 155-0:6(I) (1985).

APPENDIX

Comparison of Highly Efficient and Typical Models for Major Products

Product	Efficiency Parameter	Efficiency of Typical Model Sold in 1980	Highly Efficient Model(s) Available in 1984	Efficiency of Top Models Available in 1983/1984
Gas Furnace	Seasonal Efficiency	0.63	Consending furnaces sold by Lennox, Amana, Sears Heil, Whirlpool, <i>et al.</i>	0.94-0.96
Gas Water Heater	Overall Efficiency	0.48	Amana EGVH	0.83
Electric Heat Pump	Heating COP	1.70	State "Turbo Super-saver" Rheem Ruud RPGA and UPGA Series	0.64
Electric Water Heater	Overall COP	0.78	DEC Int. "Therma-Stor" Heat Pump Water Heater	2.60
Central Air Conditioner	SEER	7.60	Lennox Landmark IV	2.20
Room Air Conditioner	EER	7.00	Series, HS-14 Friedrich SM10G10	14.0
Top Mount Refrigerator/Freezer with Automatic Defrost (16-18 ft ³)	Energy Factor	5.60	Amana TSC-19E Kenmore 63771 Whirlpool ET17HKXM	11.5
Chest Freezer with Manual Defrost (14-16 ft ³)	Energy Factor	10.8	W.C. Wood's E420	8.70 8.40 8.40
Upright Freezer with Manual Defrost (15-16 ft ³)	Energy Factor	10.8	Kenmore 241580, 241540	18.7

Source: Geller, *Efficient Appliances and Space Conditioning Equipment; Current Savings Potential, Cost Effectiveness and Research Needs*, American Council for an Energy-Efficient Economy, Washington, D.C. July 1984.

