

## Coal Slurry Pipelines: a Railroad Perspective

NORMAN M. LORENTZSEN\*

Coal is an important element in energy self-sufficiency for this country. The energy plan offered in 1977 by President Carter is built substantially upon a foundation of coal and calls for massive conversion of present and planned facilities to the use of this fuel by 1985. This has important implications for western railroads because this plan envisions nearly a fourfold increase in coal production.<sup>1</sup>

The rise in the importance of coal to national planning processes began in the early part of this decade. The energy crisis that stunned this country in October, 1973, had palpable impacts on home and business heating as well as on the availability of gasoline for automobiles. Government and business leaders saw the cutting off of petroleum from the Middle East as an early warning of possibly worse misfortunes that could be expected to befall the U.S. if the country did not immediately undertake to become energy self-sufficient.<sup>2</sup>

---

\* President and chief executive officer, Burlington Northern Inc.; B.A., Concordia College, 1941; Harvard Business School Advanced Management Program, 1968.

1. 3 CONGRESSIONAL RESEARCH SERVICE, PUB. NO. 95-15, NATIONAL ENERGY TRANSPORTATION 460 (1978) (Prepared for the Senate Energy and Natural Resources Committee and the Commerce, Science, and Transportation Committee) [hereinafter cited as NATIONAL ENERGY TRANSPORTATION].

2. See D. RAY, THE NATION'S ENERGY FUTURE: A REPORT TO RICHARD M. NIXON, PRESIDENT OF THE UNITED STATES 41 (U.S. Atomic Energy Commission Research and Development Report, WASH-1281, 1973).

There was another emerging trend that had been developing in the national energy picture since the early 1960's. Rising concern over air quality had resulted in federal, state and local regulations governing smoke-stack emission.<sup>3</sup> Power plants and factories were forced to add expensive pollution-control equipment to diminish the sulphur and other particulates that were inherent in the eastern and midwestern coals used for the production of electricity and for industrial purposes. As a result of this development, there was a sudden interest in the vast reserves of coal that were known to exist under the arid lands of the western states.<sup>4</sup> Previously, there had been little other than local demand for western coal because, although lower in sulphur and pollutants, western subbituminous and lignite also have comparatively less heat content than eastern and midwestern coals.<sup>5</sup> Before 1970, western coals were too distant from major markets to be competitive in price with eastern and midwestern coal even though western coal could be strip-mined at less expense than eastern and midwestern coal which was deep-mined. However, the situation began to change in the mid-1970's as new mines were opened in the West and production rose dramatically.<sup>6</sup> In addition, the Middle East oil embargo of 1973 accelerated the pace of western coal development. All-coal unit trains placed into service by rail carriers made this region's coal competitive in price over an expanding area of the United States. For example, today Burlington Northern is hauling coal from western mines to users as distant as 1500 miles;<sup>7</sup> moreover, it is expected that these distances will increase as additional power plants are built.

Despite the cost and low sulphur benefits, western coal has developed at a slower pace than was originally envisioned.<sup>8</sup> This is because the lead time required for opening mines and for construction of new power plants is an important factor in coal development. Most coal is sold on long-term contracts that can vary in length from five to thirty years. Both the utilities and the mines benefit from this kind of contractual arrangement—mine operators protect their investments, and utilities have the assurance of a long-

---

3. *Id.* at 39.

4. NATIONAL ENERGY TRANSPORTATION, *supra* note 1, at 441. Identified coal reserves in the U.S. total nearly 2 trillion tons. Approximately 70% of these are in states west of the Mississippi River.

5. *Id.* at 445.

6. Coal production in Wyoming doubled between 1969 and 1972, to a total of 10,920,000 tons; by 1975 production had risen to nearly 24,000,000 tons. See 1977 KEYSTONE COAL INDUSTRY MANUAL 710.

7. Burlington Northern's longest movement of coal is from Belle Ayr, Wyoming, to Elmendorf, Texas, a distance of 1642 miles. This movement has been in operation since 1978.

8. See *Coal Pipeline Act of 1977: Hearings on H.R. 1609 Before the Subcomm. on Mines and Mining and the Subcomm. on Indian Affairs and Public Lands of the House Comm. on Interior and Insular Affairs*, 95th Cong., 1st Sess. 250 (1977) (testimony of Louis W. Menk) [hereinafter cited as *H.R. 1609 Hearings*].

term supply of fuel—sometimes as long as the expected life of the plant. The lead time factor is further affected by the impact of government regulations, including environmental protection requirements, strip-mining method laws, and site location constraints.<sup>9</sup> Consequently, although the desired rate of conversion to coal envisioned in the National Energy Plan may be delayed somewhat, over the long run the imperatives of the nation's need for energy will most likely require that the coal be produced and that it be produced in very large volumes.<sup>10</sup>

It is also important to examine the demand side of the coal equation. At present, the major users of coal are electric utilities, and there is already evidence of a strong trend for increased use of coal in the generation of electricity. National Energy Plan projections call for utilities' percentage of total energy use to rise from 45% in 1976 to 54% in 1985.<sup>11</sup> This translates into an increase in utility coal demand from 406 million tons in 1975 to 770 million tons in 1985.<sup>12</sup> However, changes in energy conservation, plant retirements, and intensity of electrical use could alter these figures.

Often overlooked is the demand for coal in the general industrial sector. Here the rate of growth in coal demand is more pronounced and conversion features of the National Energy Plan will have the greatest impact; the Plan calls for more than an 85% increase in the demand of industrial users for coal, caused largely by conversion from oil to coal.<sup>13</sup> So that, although the growth and demand will be greatest in electric utilities, increases in the rate of coal consumption will be much higher for industrial users. Moreover, the increase in industrial use will be more dramatic in instances where it entails sharp reversal of the established patterns of energy consumption. Also important is the vast number of facilities that would be using coal for industrial purposes. A 1977 tabulation by the Federal Energy Administration identified 3500 major industrial plants, diffused over a wide geographic area, which might convert to coal.<sup>14</sup> While some of the plants are relatively large users of energy, most are very small and would require only modest deliveries of coal. The number, size, and geographic scatter of these industrial coal users poses a major challenge when viewed from a transportation perspective because the overall mission of this

---

9. Geoghegan, *Western Coal: On Again, Off Again*, *Coal Industry News*, May 1, 1978, at 10, col. 1.

10. Speech by C. Bagge, President of National Coal Association, Montana Coal Council Convention, in Kalispell, Montana (Aug. 25, 1977).

11. RICHARD J. BARBER ASSOCIATES, *THE RAILROADS, COAL AND THE NATIONAL ENERGY PLAN: AN ASSESSMENT OF THE ISSUES 8* (1977) (Prepared for the following railroads: Burlington Northern Inc., Chicago and North Western, Kansas City Southern, Missouri Pacific, Santa Fe, and Union Pacific) [hereinafter cited as BARBER].

12. *Id.*

13. *Id.* at 7.

14. *Id.* at 11.

country's transportation system will be not only to move massive amounts of coal, but to move this coal over great distances and to a variety of individual locations in varying amounts.

#### RAILROADS AND COAL

When the requirements of the National Energy Plan are viewed in the light of transportation needs, it is likely that major responsibility will fall on the nation's railroads.<sup>15</sup> Railroads historically have handled most of the coal movements in the United States, and this mode of transportation will probably continue to be important because the commodity is easily adapted to rail handling. Coal is a bulk commodity that requires little in the way of protective services; it can be quickly loaded and unloaded; and it moves at a steady rate of flow over long distances.

Although compatibility has allowed railroads to be the dominant carrier in coal transport, the traffic is subject to variations in volume and railroads have had to adjust their operations accordingly. In recent years, rail coal traffic has fluctuated significantly because of demand patterns. In 1945 for example, the railroads originated almost 400 million tons of bituminous coal, but as users shifted to alternate fuels, the market for coal diminished with the result that by 1960 rail coal tonnage was down about 100 million tons from post-war levels.<sup>16</sup> Then, as users began gradually to shift back to greater use of coal in the 1970's, the coal traffic for railroads rose to levels where it had been fifteen years earlier.<sup>17</sup>

In the last five years, the railroads have experienced substantial increases in the volume of coal handled. Burlington Northern, for instance, almost doubled its coal tonnage and tripled both coal ton miles and daily unit train originations between 1972 and 1976.<sup>18</sup> Moreover, it is expected that by 1981, Burlington Northern will be handling more than three times its 1976 volume of 43 million tons.<sup>19</sup> The rail industry as a whole has seen steady and substantial increases each year, and as the National Energy Plan takes effect, these increases will continue. The coal traffic expansion of the past few years was accommodated on relatively short notice and at a time when non-coal traffic was also growing<sup>20</sup>—evidence of the industry's physical ability to expand quickly.

There are some who, when looking ahead at the large volume of coal to be transported, question the capacity of the national rail freight system to

---

15. NATIONAL ENERGY TRANSPORTATION, *supra* note 1, at 460.

16. [1945, 1960, 1974] MIN. INDUSTRY Y.B. (U.S. Bureau of Mines).

17. *Id.*

18. Coal ton-miles in 1972 were 11.1 billion; in 1976 they totaled 32.1 billion. In 1972, an average of 4 unit coal trains were originated daily; by 1976, the average was 12 per day.

19. See H.R. 1609 Hearings, *supra* note 8, at 361.

20. [1972, 1977] Y.B. OF RAILROAD FACTS (Association of American Railroads).

meet the increased demand for coal transportation.<sup>21</sup> Yet, although the volume of coal to be transported is substantial, the increases must be considered in a perspective with all other traffic. In this light, the increase in total rail traffic volume would not be overwhelming; with coal added to non-coal traffic the annual growth in total tonnage would be just over 3%.<sup>22</sup> Past experience indicates that the anticipated growth in coal traffic, although large and challenging, will be manageable.

Increased coal volume will greatly improve the utilization of the physical facilities of the rail industry which is characterized by overcapacity—in terms of both individual lines and the overall system of 200,000 miles of rail line now in service. The Department of Transportation has determined that a third of the rail lines carry only one percent of railroad traffic. Measured in gross ton miles, the Department has reported that two-thirds of the traffic moves on just 40,000 miles or twenty percent of the lines.<sup>23</sup> The expected coal volume will result in added traffic for many of the underused lines and any isolated capacity deficiencies on more intensively used lines that might be presented can be remedied through operational changes and by modifications of the physical plant.

In considering rail coal-handling capacity, recognition must be given to the fact that the movement of coal lends itself well to high-utilization techniques such as unit-train handling. Unit trains are composed of 100 or so cars and power units that are dedicated entirely to one movement. The unit train is in almost constant motion shuttling between origins and destinations. These trains avoid the delays of conventional handling by circumventing major terminals and by being loaded and unloaded rapidly. Unit-train movements also are highly predictable, permitting maximum efficiency in use of main-line capacity. These characteristics translate into important operational capacity enhancement notwithstanding any consideration of the excess physical capacity. Recognizing these capabilities, recent studies by the Office of Technology Assessment and the Department of Transportation have concluded that the nations' railroads have the physical and operational ability to meet the transportation needs of the National Energy Plan.<sup>24</sup>

For railroads, the surge in coal traffic does not present capacity problems; however, it does present a challenge in terms of the investment required to acquire equipment and to improve the quality of tracks and

---

21. See NATIONAL ENERGY TRANSPORTATION, *supra* note 1, at 460.

22. *The Race to Carry Carter's Coal*, BUSINESS WEEK, May 16, 1977, at 78 [hereinafter cited as BUSINESS WEEK].

23. BARBER, *supra* note 11, at 31.

24. OFFICE OF TECHNOLOGY ASSESSMENT, CONGRESS OF THE UNITED STATES, A TECHNOLOGY ASSESSMENT OF COAL SLURRY PIPELINES 16 (1978) [hereinafter cited as O.T.A.]; COAL TRANSPORTATION TASK FORCE, U.S. DEPARTMENT OF TRANSPORTATION, TRANSPORTING THE NATION'S COAL—A PRELIMINARY ASSESSMENT, REPORT TO THE SECRETARY OF TRANSPORTATION at ii (1978) [hereinafter cited as COAL TRANSPORTATION TASK FORCE].

roadbeds over which coal will be hauled. One study by the Department of Transportation has estimated U.S. railroads' investment needs for coal to be about ten billion dollars.<sup>25</sup> This challenge is heightened because these massive investments are required before the coal is to move. Burlington Northern, for example, currently is in the process of investing nearly one billion dollars in equipment and track improvements so that it can be ready to handle the coal that is scheduled to be moved over the next several years.<sup>26</sup>

While utilities, industry, and coal producers also face large-scale capital needs, it is expected that they will be able to adjust their prices sufficiently to show a level of earnings needed to attract the necessary capital. The generally anemic financial conditions of the rail industry, however, cast railroads in an unfavorable light when competing in the money markets. Since the mid-1960's, railroad earnings have been in a general decline.<sup>27</sup> To a degree, this has been caused by the diversion of traffic to other modes of transportation leading to a reduction in the revenues needed to offset the costs of unused plant capacity. Reflective of this decline, U.S. railroads' ratio of net income to net worth fell from just over 5% in 1960 to 1.8% in 1976.<sup>28</sup> By comparison, unregulated manufacturing firms' ratios for 1976 averaged 15% and electric and gas utilities showed ratios of nearly 12%.<sup>29</sup> Because of this prolonged drought in earnings, railroads have not been able to generate sufficient internal funds to finance long-term capital investments; and consequently, have had to rely increasingly on external sources of funding. This pattern is evident in the railroad industry capital structure. The share accounted for by equity declined from 65% in 1964 to less than 56% in 1974.<sup>30</sup> This increased reliance on debt has been accompanied by large increases in interest costs: between 1965 and 1975, interest payments on funded debt rose 87% while interest on unfunded debt—as used in equipment financing—showed an increase of 558%.<sup>31</sup>

Not only has the increased reliance on debt been costly, it has not been adequate for the industry's needs. Because of the lack-luster record of earnings, much of the debt financing the industry has been able to obtain often is conditional and restricted to equipment acquisitions.<sup>32</sup> Funds needed for improvements in physical plant are difficult to obtain, and where internal earnings are insufficient, individual railroads have no choice but to

---

25. *Coal's Clouded Post-Strike Future*, TIME, April 17, 1978, at 75.

26. 1977 ANNUAL REPORT OF BURLINGTON NORTHERN, INC. 5.

27. BARBER, *supra* note 11, at 46.

28. *Id.* at 48.

29. *Id.*

30. *Id.* at 50.

31. *Id.* at 51.

32. See NATIONAL ENERGY TRANSPORTATION, *supra* note 1, at 464.

delay improvements on tracks and roadbeds.<sup>33</sup>

The foregoing indicates that the expected burgeoning of coal traffic presents a two-dimensional prospect to the railroad industry. First, it is an immense opportunity to solve the overcapacity problems and generate the cash flows that will, in turn, allow greater financial self-sufficiency and much-needed rehabilitation of the physical plant. It will also be a challenge of equal proportion in terms of the large-scale investments required. It is hoped that the investment community will place enough reliance on future prospects of coal revenues to advance the funds necessary to realize such revenues.

#### COAL SLURRY PIPELINES VERSUS THE RAILROAD INDUSTRY

Set against the backdrop of the railroad industry's desire to handle the large volume of coal envisioned by the National Energy Plan, coal slurry pipelines represent a threat to the attainment of those volumes. Coal slurry is a relatively new technology that involves the pulverization and mixing of coal with water so the mixture can be pumped through large pipelines over long distances. Several proposals are now being advanced to move coal by slurry pipeline from western and Appalachian coal fields to destinations as far as 1,000 miles.<sup>34</sup> The major proposals envision movements of as much as 25 million tons of coal per year by a single pipeline.<sup>35</sup> This would be the equivalent of about 250,000 rail carloads; only two lines of this size could move an amount equivalent to the total coal Burlington Northern carried from western mines in 1977. In terms of coal revenues at today's rate levels, a single, 25-million ton slurry pipeline would have the potential to divert about one-quarter of a billion dollars annually from rail transport<sup>36</sup>—a prospect that has caused a marked degree of alarm to the railroad industry and could affect the attitudes of the investment community which is expected to supply the capital for coal-related rail improvements.

To acquire the right-of-way for their facilities, pipeline promoters are seeking the powers of eminent domain in Congress and in certain states to condemn land.<sup>37</sup> Their most aggressive lobbying effort has been at the federal level. In 1974, a coal slurry eminent domain bill was passed by the

---

33. *Id.*

34. Although a number of coal slurry pipelines have been discussed, most prominent is a pipeline, 38 inches in diameter, that would run from near Gillette, Wyoming, to Little Rock, Arkansas, a distance just over one thousand miles. This pipeline is being promoted by Energy Transportation Systems, Inc. COAL TRANSPORTATION TASK FORCE, *supra* note 24, at IV-2.

35. *See id.*

36. Assumes a freight cost of \$10.00 per ton or \$.01 per ton-mile. This is a rough average of current Burlington Northern unit train coal rates. Actual revenue losses would depend on the specifics of the movement diverted and the rate-levels in effect at the time.

37. *See* COAL TRANSPORTATION TASK FORCE, *supra* note 24, at IV-2.

U.S. Senate but not by the House.<sup>38</sup> In 1975, four similar bills were introduced in the House of Representatives and extensive hearings were held by the Committee of Interior and Insular Affairs, focusing on H.R. 1863.<sup>39</sup> This bill was tabled in 1976 pending a study by the Office of Technology Assessment on the impacts of coal slurry pipelines. Legislative efforts were renewed in 1977 in the form of H.R. 1609,<sup>40</sup> which was delayed until February of 1978 when an amended version passed the House Interior and House Public Works and Transportation Committees. The bill came before the House on July 19, 1978, and was defeated by a vote of 246 to 161.<sup>41</sup>

Developers of coal slurry pipeline proposals are attracted by the prospect of profits through the construction and financing of the projects. Burlington Northern made an extensive study of the feasibility of constructing a slurry pipeline out of the Powder River Basin coal fields which it serves.<sup>42</sup> The study indicated that the profit potential from construction could be diminished by environmental and water source problems. Moreover, it was felt that the cost uncertainties and inflexibility would be a severe handicap in obtaining customers for the line. Construction opportunities notwithstanding, the transportation aspects of slurry pipelines did not offer much in the way of profit potential nor economic viability.<sup>43</sup>

For firms such as Bechtel Corporation and Lehman Brothers, whose perspectives are on construction and finance rather than transportation, however, the profit prospects of slurry lines evidently appear more sanguine. Thus, they strongly supported the efforts to obtain authority for eminent domain.<sup>44</sup> They have argued that there is compelling need for coal slurry pipelines to meet National Energy Plan goals and that pipelines are needed to break a railroad "monopoly" in the transportation of coal.<sup>45</sup> Railroads and other allied groups have responded that there is no need for a duplicate transportation system to be built, and have emphasized the potential hazards to water supply, to the environment and to the national economy inherent in development of slurry pipelines.<sup>46</sup>

As Congressional deliberations of the coal slurry legislation progressed, it became clear that this was much more than a parochial skirmish between industry interests. The issues that emerged were of serious

38. S. 3870, 93rd Cong., 2d Sess. (1974).

39. H.R. 1863, 94th Cong., 1st Sess. (1975).

40. H.R. 1609, 95th Cong., 2d Sess. (1977).

41. 124 CONG. REC. H6971-72 (daily ed. July 19, 1978). See generally Williams, *Burlington Road Limpes Faster*, N.Y. Times, Feb. 12, 1978, § 3 (Business), at 1, col. 1.

42. Study done jointly with Bechtel Corp. and Peabody Coal Co.; information is not publicly available.

43. *Id.*

44. See BUSINESS WEEK, *supra* note 22.

45. *Id.*

46. See generally H.R. 1609 Hearings, *supra* note 8.



and far-reaching nature with direct and substantial impact on a number of public policy questions. The Office of Technology Assessment, which was asked by Congress to provide an assessment of major issues, identified the main areas of public concern as follows:

At least three major sets of policy questions must be addressed to arrive at a legislative conclusion. The first involves the desirability from social, economic, and environmental standpoints of developing a coal slurry pipeline industry. The second is related to the extent to which the present regulatory and institutional arrangements would have to be altered to provide for the allocation of coal traffic between pipelines and railroads in a way that would represent the least cost to society. The third concerns the balance of Federal and State control over such areas as water resource allocations, land ownership, and local environments, and how conflicting regional interests might be resolved.<sup>47</sup>

The foregoing indicates that the consequences of coal slurry line development, resulting from granting of eminent domain authority, would affect millions of citizens. Western ranchers and environmentalists concerned about use of water, railroad employees and the communities of which these employees are a part, electric power consumers whose chief concern is a reliable and low cost source of electricity: all have a direct interest in this legislation.

#### EXAMINATION OF COAL SLURRY ISSUES

##### *EMINENT DOMAIN*

Eminent domain is the power to take private property without the owner's consent provided he is compensated on the basis of fair market value.<sup>48</sup> The concept is of ancient derivation, originally based on an inherent power of a sovereign, and is sparingly given. Usually the power is granted by a state only in situations where a significant public need is to be filled by the services of the instrumentality seeking the authority.<sup>49</sup>

It should be noted that when eminent domain is conferred, it is usually a result of state legislation; it is rarely granted by the federal government.<sup>50</sup> Inasmuch as six western states have specifically granted conditional eminent domain to coal slurry pipelines, a proposed pipeline from Gillette, Wyoming to Little Rock, Arkansas being promoted by Energy Transportation Systems, Inc. might be built under those authorities—or possibly under a general authority in some of the other western states.<sup>51</sup> From the standpoint of the slurry promoters, however, it would be much easier to have the blan-

47. O.T.A., *supra* note 24, at 9.

48. Walker, *Coal Slurry Pipelines and National Transportation Policy: A Critical Review*, 12 LOGISTICS AND TRANSP. REV. 262 (1976).

49. *Id.*

50. *Id.*

51. O.T.A., *supra* note 24, at 133.

ket federal eminent domain authority and not have to prove "public benefit" conditions in each state along the routes of the lines.

In petitioning for federal eminent domain authority, the slurry advocates have put forth several arguments as justification. First, they claim that there is a significant need for another system of transportation because of insufficient rail capacity. Further, they argue that another mode of transportation is needed to provide "rate competition" for the railroads. Finally, they argue that natural gas pipelines have federal eminent domain authority, and so should slurry pipelines.<sup>52</sup>

The argument that railroads do not have the physical capabilities to handle the coal needed in the future has been largely laid to rest by numerous studies, conducted by independent analysts.<sup>53</sup> Moreover, while one part of the Bechtel organization was proclaiming that western railroads were deficient in capacity, another Bechtel group concluded, in a study performed for a midwest power pool, that "there appear to be no significant physical, operational, or environmental reasons why western coal growth cannot be accommodated by the railroads."<sup>54</sup>

To the contention that slurry pipelines are needed to provide competition to railroads, there is competition between coal and other types of fuels such as nuclear and oil, competition among geographic coal-producing regions, competition among modes of transportation and competition among rail carriers. As an example, the Powder River Basin coal-producing area will be served by Burlington Northern, as well as by the Chicago North Western.<sup>55</sup> In addition, coal is currently being trucked out of that area to market.<sup>56</sup> In short, the competition among fuels, regions, modes and railroads has been an influence in keeping transportation costs for western coal at levels well below that of other commodities.<sup>57</sup> This should indicate that rail coal rates are not based on monopoly pricing. But even were the contrary true, the Interstate Commerce Commission has and exercises full authority to review and change any rates felt to be unjustifiably high (or for that matter, unreasonably low).<sup>58</sup> As legislation now stands, customers of slurry pipelines would not have this kind of governmental protection against excessive pricing.<sup>59</sup>

---

52. Walker, *supra* note 48.

53. See sources cited in note 24 *supra*.

54. BECHTEL CORP., WESTERN COAL UTILIZATION IN THE MID-CONTINENT AREA POWER POOL, A PRELIMINARY ASSESSMENT PERFORMED FOR THE MID-CONTINENT AREA POWER POOL at 7-54 (1975).

55. H.R. 1609 Hearings, *supra* note 8, at 254 (testimony of J. Wolfe).

56. Address by A. Stenseth, Director of South Dakota Dept. of Railroads, Western Rural Editor's Exchange, Rapid City, South Dakota (April 20, 1978).

57. See Walker, *supra* note 48, at 265.

58. *Id.*

59. A later section will deal in more detail with this and other anti-competitive aspects of coal slurry pipelines. See text accompanying notes 68-72 *infra*.

Finally, as to the argument that because federal eminent domain has been given to natural gas pipelines, it should also be given to slurry pipelines, an examination of the facts indicates little similarity between natural gas and coal slurry pipelines. The grant of federal eminent domain to natural gas pipelines was only a part of a general plan for comprehensive regulation of the natural gas industry.<sup>60</sup> The slurry-line promoters and the coal industry have not sought and are not subject to this type of regulation. Moreover, pipelines are the only means by which natural gas can be feasibly transported over long distances.<sup>61</sup> Coal, on the other hand, is being transported by highway, water and rail transport.<sup>62</sup>

In summary, the usual justifications voiced in support of granting eminent domain authority are questionable. Furthermore, as the following discussion will indicate, the development of coal slurry pipelines may have consequences which are detrimental to the environment, to a balanced transportation policy and to the consuming public.

#### WATER PROBLEMS

In the West, coal slurry pipelines face a water problem. This, far more than comparative costs or pace of development, will serve to limit their usefulness. The development of several [large diameter] lines out of a given area will require a water draw-down that may seriously impact other regional developments.<sup>63</sup>

The water-depletion hazard associated with slurry pipelines has been one of the most potent deterrents to passage of eminent domain legislation. One ton of water is required to transport each ton of coal in the slurry method; for a 25 million ton per year line, the water used amounts to about six billion gallons per year.<sup>64</sup> Because of prohibitive costs of recycling, the water must be obtained from the area where the coal is mined, making the problem especially severe in the western coal regions where water is already in short supply.<sup>65</sup>

Aside from the physical depletion of water resources, there is serious concern that federal eminent domain for coal slurry pipelines may undermine the right of individual states to control their own surface and ground-

---

60. See O.T.A., *supra* note 24, at 135.

61. *Id.*

62. 1 CONGRESSIONAL RESEARCH SERVICE, PUB. NO. 95-15, NATIONAL ENERGY TRANSPORTATION 43 (1977).

63. 1 CENTER FOR ADVANCED COMPUTATION, UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN, COMPARATIVE COAL TRANSPORTATION COSTS: AN ECONOMIC AND ENGINEERING ANALYSIS OF TRUCK, BELT, RAIL, BARGE AND COAL SLURRY AND PNEUMATIC PIPELINES, at 1-59 (prepared for U.S. Bureau of Mines and the Federal Energy Administration) (1977).

64. E. Wasp, Progress with Coal Slurry Pipelines (Sept. 30, 1975) (paper presented at American Mining Congress, 1975 Mining Convention, San Francisco, California) [hereinafter cited as Wasp].

65. *Id.*

water resources. The recent evaluation of issues by the Office of Technology Assessment pointed out the possibility that an individual state might not be able to impose water-use restrictions on a slurry pipeline company once that company had received federal certification.<sup>66</sup> These concerns about misappropriation and deterioration of control of water have united major agricultural and environmental organizations into a bloc of opposition which may effectively impair the development of large coal-slurry pipelines in the West irrespective of eminent domain questions.<sup>67</sup>

#### ANTICOMPETITIVE CHARACTERISTICS

Competitive abuses may be inherent in coal slurry pipeline development. An OTA report has pointed out that "coal slurry pipelines will make arrangements with shippers by throughput and deficiency agreements or ship-or-pay contracts. Although these arrangements can serve valid business purposes, they also impose a restraint on trade."<sup>68</sup>

The throughput—or "take-or-pay"—contract is an arrangement which would obligate the shipper to take, or pay for, a fixed volume of coal annually over a period of 20 to 30 years. While the use of throughput contracts would offer extraordinary competitive advantage to slurry pipeline operations, the restraint-of-trade effects could be devastating to other modes of transportation and disadvantageous to electric power consumers. Common carrier railroads are not allowed to make similar long-term contracts.<sup>69</sup> One effect of the "take-or-pay" device would be to insulate large segments of coal traffic from competition by other modes for long periods of time. Because the shipper would be contractually obligated to the slurry pipeline, such traffic would be lost beyond recall despite any cost or operational innovations which might be effected by a competing carrier.<sup>70</sup> This would amount to a virtual coal slurry pipeline monopoly of the traffic involved. Moreover, not only would competing carriers be shut out, but also the electric consumer would be prevented from taking advantage of any benefits which might develop over the period from fuel technology changes or from improved productivity in transportation.

There are several other aspects of coal slurry operation which may give an unfair competitive edge to that mode. Slurry pipelines will probably not

---

66. According to O.T.A., *supra* note 26, at 20, the Commerce and Property clauses of the U.S. Constitution provide sufficient power to the Federal government to assure adequate water supplies to a coal slurry line despite any restrictions by a state. Moreover, the report warns that *First Iowa HydroElectric Cooperative v. Federal Power Commission*, 328 U.S. 152 (1946), suggests that federal certification of coal slurry pipelines will negate state attempts to control use of its own waters for this purpose.

67. See *BUSINESS WEEK*, *supra* note 22.

68. O.T.A., *supra* note 24, at 130.

69. *Id.* at 126.

70. *Id.* at 130.

be required to assume the public responsibilities and regulations required of common carrier railroads. Essentially private carriers, slurry pipelines would not be subject to strict regulations on entry, abandonment and extension as are common-carrier railroads. In addition, railroads are required by the Interstate Commerce Commission to perform unprofitable services on low-volume branch lines and must provide service to small and large customers alike.<sup>71</sup> Slurry pipelines would have no obligations in these areas.

A sound national transportation system depends on a balance among modes of transportation. Consequently, if one carrier is allowed to use monopolistic contract privileges and is given absolution from common-carrier regulation, the system could be destructively imbalanced to the detriment of the economy as a whole.<sup>72</sup>

#### IMPACT ON RAILROADS AND USERS

Slurry pipeline development could have a devastating effect on the marginal segments of the railroad industry as well as on businesses who ship by rail. This danger was recognized by former ICC Chairman, George Stafford, who stated that:

Diversion of coal traffic could result in railroads having to reduce their service to coal producing areas, further depriving them of revenue and perhaps forcing them to increase their rates on other commodities to cover operating costs. In some cases, such diversion could pose a threat to a railroad's very existence.<sup>73</sup>

Massive new investments will have to be made prior to the time the larger coal volumes move and will come mostly from borrowed funds.<sup>74</sup> Construction of proposed coal slurry lines would not significantly reduce the railroads' capital investment requirements, because, as common carriers, the railroads would be required to deliver the coal while the pipelines were being constructed.<sup>75</sup> Consequently, the diversion to pipelines would leave the railroads with a huge debt service and repayment burden while a substantial part of the coal revenues, which were being counted on to repay the debt and interest, would be locked away from competitive recapture.

Diversion by a single, 38-inch pipeline could result in a loss of rail coal revenues approximating \$250 million.<sup>76</sup> Faced with a shortfall of these dimensions, it is possible that marginal railroads could be forced into bank-

---

71. *Id.* at 125.

72. *Id.*

73. *Coal Slurry Pipeline Legislation: Hearings on H.R. 1863, H.R. 2220, H.R. 2553, and H.R. 2986 Before the House Committee on Interior and Insular Affairs, 94th Cong., 1st Sess., 625 (1975) (testimony of G. Stafford, Chairman of the Interstate Commerce Commission) [hereinafter cited as Stafford].*

74. See BARBER, *supra* note 12, at 58.

75. See *H.R. 1609 Hearings*, *supra* note 9, at 345 (statement of Louis W. Menk).

76. See note 36 *supra*.

ruptcy; or at the least, have to cut drastically back on service and try to raise rates on other commodities to generate cash flows sufficient to meet fixed charges.<sup>77</sup> These consequences would have a direct and negative effect on the overall economy as well as on individual communities.

Diversion of coal to slurry pipelines would also cause higher shipping costs to shippers whose needs would not match the huge volumes necessary for slurry transport.<sup>78</sup> Shrinkage in rail revenues without a corresponding reduction in unavoidable costs of coal-related plant expansion would result in net income reduction. This could mean that rail shippers of coal and other commodities would be called upon to bear a larger part of these costs if railroads could not absorb the shortfalls.<sup>79</sup> This could hit medium and small coal shippers especially hard, but could result in higher transportation costs for shippers of grain, lumber and other rail-carried products as well.<sup>80</sup> In short, coal slurry pipelines' benefits would accrue to only a handful of giant firms while the costs and burdens would have to be carried by the shipping public at large.

Another related negative impact of coal slurry pipeline development would be loss of job opportunity for thousands of railroad workers. Pipelines are much less labor-intensive than railroads, requiring considerably fewer employees to operate the system.<sup>81</sup> Construction jobs for pipeline construction are of short duration. Slurry pipeline developers admit that a diversion of 25 million tons of coal from rail to slurry would result in a net loss of about 2200 jobs.<sup>82</sup> The effects of this on local economies must be factored into any evaluations of public impacts expected from coal pipelines.

#### CONSUMER CONSIDERATIONS

Perhaps the greatest obstacle to coal slurry pipeline development will be the cost uncertainties, inasmuch as there are no large-diameter coal slurry pipelines in existence in this country, and all cost estimates at this time are hypothetical.<sup>83</sup> The necessity to predict future costs of construc-

---

77. See Stafford, *supra* note 73.

78. See generally BARBER, *supra* note 11, at 73.

79. See O.T.A., *supra* note 24, at 81.

80. *Id.*

81. 1 F. ARMBRUSTER & B. CANDELA, RESEARCH ANALYSIS OF FACTORS AFFECTING TRANSPORTATION OF COAL BY RAIL AND SLURRY PIPELINE 146 (Hudson Institute document HI-2409-RR, 1976) [hereinafter cited as HUDSON].

82. Wasp, *supra* note 64.

83. See M. REIBER & S. SOO, ROUTE SPECIFIC COST COMPARISONS: UNIT TRAINS, COAL SLURRY PIPELINES AND EXTRA HIGH VOLTAGE TRANSMISSION 18 (Center for Advanced Computation, University of Illinois at Urbana-Champaign Document No. 190, 1976); HUDSON, *supra* note 81, at 142.

The only coal slurry pipeline currently in operation is a 270-mile line from Black Mesa, Arizona, to Mojave, Nevada. This 18-inch line is one-half the size and only one-fourth the length of the

tion, in itself, adds a major element of uncertainty to pipeline cost determination. Pipeline construction costs have increased at a steep rate in recent years and there are no indications that this will change in the future.<sup>84</sup> Uncertainties about future labor productivity and inflation rates, as well as legal delay, compound the task to a point where the range of uncertainty associated with prediction of pipeline costs relative to rail costs can be as great as the difference between them.

The risks of these uncertainties, however, are to be borne by the consumer rather than by the pipelines or utilities. An important aspect of slurry pipeline development is that total costs are not known to the utility customer until *after* the pipeline is built.<sup>85</sup> The utility, however, is required to bind itself to a long-term take-or-pay contract prior to beginning of construction so that the pipeline builders can obtain project financing.<sup>86</sup> If after actual construction and operational costs were realized, the pipeline transportation costs were higher than the rail alternative, the utility would be contractually bound to take the coal at the higher price; and the consuming public would have no choice but to underwrite the extra costs. Referring to this danger, the Hudson Institute study states: "We fail to see why the public with no vested interests in a private enterprise must bear its risk of going sour."<sup>87</sup> This feature of slurry transportation can be regarded as antipathetic to the public interest.

From a national coal consumption standpoint, slurry pipelines by nature do not match actual and projected demand patterns. To achieve their claimed maximum economies, pipelines must be of gigantic capacity and terminate at facilities equipped to use coal in quantities equivalent to the pipelines' annual through-put capacity.<sup>88</sup> In reality, such conditions will likely not exist. Air protection regulations prohibit large-scale concentrations of coal-burning, power-generating plants.<sup>89</sup> Even a large 800 megawatt plant would require only about one-eighth of the volume of a 38-inch pipeline as is being proposed.<sup>90</sup> The actual patterns of future coal demand will be characterized by thousands of widely scattered coal users with a wide range of needs in terms of volume and types of coal.<sup>91</sup> While these

---

slurry lines currently being promoted. See COAL TRANSPORTATION TASK FORCE, *supra* note 24, at IV-3.

84. According to Bureau of Accounts, Interstate Commerce Commission, *Schedule of Annual Indices for Carriers by Pipeline 1948 through 1975* at 8 (1976) (not yet adopted by the ICC), pipeline construction costs increased 73% from 1970 to 1975.

85. See HUDSON, *supra* note 81, at 144.

86. See O.T.A., *supra* note 24, at 130.

87. HUDSON, *supra* note 81, at 144.

88. See BARBER, *supra* note 11, at 62.

89. *Id.* at 63.

90. *Id.* at 62.

91. *Id.*

need patterns make a good match with existing rail transportation capability, they will not be met by a large, inflexible system such as a coal slurry pipeline. If eminent domain privileges are to be predicated upon substantial benefit to the overall public, coal slurry pipelines would fall far short of meeting this test because of consumer risk and consumer inaccessibility.

#### TRANSPORTATION POLICY

Although clothed as an energy-related proposal, the legislation for slurry pipeline eminent domain probably should be viewed in the light of national transportation policy. There is the danger that concern about energy development might override practical considerations implicit in the nation's need for a sound and balanced transportation system. Under law and existing policy, the Congress contemplates the development of a balanced and economically sound system of common carriage.<sup>92</sup> This is to provide the public an integrated transportation system in which each mode complements every other mode so as to maximize the nation's logistic capabilities. In view of these considerations, it is important to examine the effect on the transportation equilibrium that would occur if development of coal slurry pipelines is encouraged through the grant of eminent domain.

The railroad industry views coal slurry promoters as striving for a position of special advantage.<sup>93</sup> The federal power to condemn land is a privilege not given to rail coal transportation carriers;<sup>94</sup> without the responsibilities or the regulations of true common carriage, coal slurry pipelines would be essentially private carriers, handling only one commodity and providing service only to those few large customers that offer them the most profitability.<sup>95</sup> These advantages, plus the ability to use "take-or-pay" contracts, give slurry transportation the capability to upset the balances needed to maintain a sound transportation system overall. The ways by which such potentially destructive competition could financially devastate carriers dependent on coal movements have been discussed,<sup>96</sup> and these consequences will have to be borne not only by railroads but also by the communities and shippers dependent on rail service.

---

92. See Walker, *supra* note 48, at 264.

93. Congressman Skubitz has also expressed this view: "We are, I suggest, talking about legislation to grant a special and totally unprecedented privilege to a small group of promoters seeking to use our legitimate concern about the Nation's energy needs as an opportunity to pocket some fast bucks." 122 CONG. REC. H5009 (daily ed. May 27, 1976) (remarks of Rep. Skubitz).

94. Campbell, *Eminent Domain: The Origin, Meaning, and Relevance to Coal Slurry Pipelines*, 1977 *TRANSP. J.* 5.

95. See O.T.A. *supra* note 24, at 125.

96. See text accompanying notes 68-72 *supra*.



## CONCLUSIONS

Coal will play an increasingly important role in this country's move to self-sufficiency. If the related transportation task is to be accomplished efficiently, a high standard of performance by the nation's railroad industry is essential. The industry has demonstrated its competence; that competence must not be undermined in the interests of construction and financial firms.

In the final analysis, the coal slurry pipeline controversy comes down to a question of public policy: Is it in the best interest of this country to facilitate the development of another specialized carrier when such development would darken the future of an entire existing industry? Coal slurry pipeline development could very well debilitate the financially fragile portion of this country's railroads and lead the industry dangerously close to the fate of the Penn Central. If this happens, the energy crisis may be joined by a "railroad crisis" of alarming proportions. The cost of this to the national economy would be enormous. This realization should cause sober reflection by the nation's policymakers, and one can only hope they will not overlook the dangers that lurk amidst the flurries of excitement over new technologies.

