

ute the costs and benefits associated with moving coal from mine to consumer and the disposition of the waste by-products from coal power generation.

#### Reference

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#### PANEL DISCUSSION

W. Lovejoy

I'll concern myself with a discussion of possible transportation of energy impacts in urban areas. Now first of all, I'd like to say that when we get into the subject of impacts, it's pretty difficult, in fact it's misleading, to try to talk in terms of global impacts. What we really have to do is focus on the particular area where we're trying to measure impacts, because each of the urban areas or parts of this country have such different characteristics as far as transportation is concerned and as far as the energy requirements are concerned. I'll concentrate my remarks on the transportation situation as it's likely to develop in energy along the Eastern Seaboard and since I know more about the New York metro area than any other place, I'll start from there in my discussion.

As many of you know, the Eastern Seaboard has quite different characteristics from the U.S. norm in their energy use and therefore their energy transportation problems. All the major urban areas, from Boston down to Baltimore, are heavy users of petroleum. In the New York area, for instance, 75% of the total energy that's used in that large metro area, and that includes northeastern New Jersey, is petroleum and a very large proportion, something like 65 to 70%, of that petroleum is imported. So right off the bat, you can see that whereas we've been talking almost exclusively in the whole meeting of land transportation problems, the major problem that the Eastern Seaboard urban areas have is how to handle the ocean or water movement of energy materials and what does that mean in terms of impacts on the local areas? In 1978, these ports from Boston south to Baltimore received something pretty close to a hundred million long tons of petroleum imports; and that's a lot of petroleum coming in.

Conversely, with a few exceptions, because of transportation costs or problems and/or environmental restrictions, the use of coal in these areas even by the utilities is very minimal. In the New York area, it's just about nonexistent. We used to import 25 million tons of coal a year into the New York area; that was used primarily by the utilities in the area. That was 25 years ago. Now we import something less than a million tons of coal into this area. And so, again, we have a situation which is atypical when you're thinking of the average which exists in the country. We also have substantial power coming into the region, and this is also true of the whole East, through the grid system that was mentioned yesterday. This eliminates any fuel transportation requirements for this energy since the power comes in through wire in the form of electricity. And, finally, we make a substantial use of natural gas. The use of natural gas was discouraged a couple of years ago, as you know, and the utilities and some industries in the region along the East Coast began to switch away from that fuel. Now, the trend has turned, at

least temporarily, and some of the utilities and industries are switching back to natural gas.

Well what does this mean in terms of transportation? First of all, and the only figures I have are for New York so I hope you will excuse my rather parochial view of the situation, we had in the last year some 4,500 tanker movements into and out of the port of New York. These tankers are carrying crude oil for the refineries along the coast of New Jersey. They're carrying large amounts of residual oil, which is used primarily by the utilities in the region, and they're carrying a substantial amount of product, aviation fuel, gasoline, and other types of distillates which are used for various purposes in the region. Now all along the Eastern Seaboard, there are channel limitations which severely restrict the size of tankers used to bring the oil into the region. New York Harbor, and the Hudson River Channel have a 45-foot depth. Most of the other ports are restricted to about 35 feet which keeps the size of tankers down anywhere from 30,000 tons to an exceptional 70,000-ton tanker. This means that we have many more tanker movements than we would need to have if we could handle large supertankers. It also means that the transportation costs of moving the needed petroleum to this region are higher than they would be if the energy were moved in supertankers. And this inevitably leads to suggestions which have been made frequently in the past few years, that we ought to have some kind of a supertanker terminal off the shore of the East Coast cities. This was a very real possibility for a while, in fact, we're still continuing to look at it; but the announced Federal policy of restricting the imports of oil, in fact, cutting down the imports of oil, makes the economics of the very costly construction of a terminal like this rather questionable. So I expect that for the foreseeable future no supertanker terminal will be constructed off the East Coast and whatever oil comes in from overseas, (and this also includes oil that may come by water all the way from Alaska or some coming up from the Gulf) will have to come by small tankers which produce higher transportation costs as well as environmental problems in terms of spillage. The traffic is heavy enough so that we have accidents, groundings, collisions, and there seems to be very little that can be done to improve that situation because of the great economic problems which would be involved in setting up a system where the larger tankers could be used and therefore the movement of tankers could be diminished. Okay, that's the unique situation we have as far as oil is concerned.

Coal, as I said, we use very little. If the President's policy of achieving only a 50% use of oil by the utilities were to be implemented in our area, it would require two things: first of all, we have very high restrictions as to air quality. We have .3 percent sulphur requirements for both oil and coal, which means in effect that we cannot use coal at all since the coal that's available to us from the Appalachian areas where the transportation costs can be managed has a higher sulphur content. Also most of the oil that we must use has to come from the OPEC nations where low sulphur crude oil is available to us. In terms of coal, that sulphur content restriction either has to be changed or there has to be some drastic improvement both technologically and economically in the ability to remove the sulphur from the emissions when the utilities burn higher sulphur coal. The second thing that has to be done is to devise a system of transporting the coal to the region in the volumes that would be required, which would be substantial. As I said before, 25 years ago in the New York area, we used to handle well over 20 million tons of coal a year.

Those facilities, the local facilities, have deteriorated to a point where they cannot handle the volumes that would be required and in terms of the modern methods of moving coal by unit trains. New facilities would have to be built.

There are alternatives. There has been a suggestion called Project ICONN that the way to solve the problem of coal use on the Eastern Coast is to deepen the Erie Canal and widen it so that it could be used efficiently for barge or collier transportation of low sulphur western coal via the Great Lakes down through the Erie Canal to the Atlantic Ocean where it could be distributed up and down the coast. A further part of that would be to use the tremendous amounts of fill that would be developed by such a project to construct about 10 miles off the New York and New Jersey coast, either an "energy island" or what you might call a "dirty industry island," for industries which we have great problems in siting in the urban area there because they don't make good neighbors. This would require an investment of many billions of dollars and it is being talked about but I don't think very seriously so far.

Liquid Natural Gas (LNG) shipments had been regarded as a very excellent means of supplementing the supplies of natural gas that we would use in the region. Natural gas is really a natural for an urban area like ours because of the very low air quality impacts that the use of natural gas enables.

W. BROBST: And no waste island

W. LOVEJOY: That's right. We unfortunately had a fire in a \$40 million facility that had just been completed or was about completed on Staten Island for the importation of substantial amounts of LNG. The explosion and the fire were not because of LNG. They were simply cleaning the tanks after construction with the use of a chemical that caught fire and exploded, but it was interpreted by the general populace as being an LNG hazard. Since that time there has been an absolute prohibition of the location of LNG facilities, either on Staten Island or any other place that we could think of for the use of this fuel. So from the transportation standpoint, it looks like the delivery of liquid gas by water is just out as far as the New York area or the whole Eastern Seaboard except for Boston which is now getting a certain amount and I don't know how they ever were able to do that but they do it right now.

The final new energy source or augmented energy source could be a buildup of the electric grid that exists over the whole northeastern part of the country. Even there we're running into problems with certain kinds of electrical or electronic emissions from high voltage lines, which are supposed to affect the milk production of cows that are in the nearby vicinity of the lines and disturb television and radio reception and that sort of thing. So here also, we have problems in looking toward a further or more extensive use of this type of energy.

The main impact I think of the transportation problems and in particular the transportation setup we have for energy along the East Coast is that our energy costs are very much higher than the average for the country. We're the high energy cost part of the U.S. and part of that is distribution problems in very heavily populated urban areas. Part of it is the substantial transportation costs that we have and a question that could be posed is, this something that the Nation should just accept or should there be some effort to even out these costs throughout the country through one means or another rather than having the eastern part of the U.S. which is so populated and has so many people continue to suffer with these high energy costs?

W. BROBST: Thank you Warren. Kathy, how did you ever allow LNG to come into Boston?

K. STEIN HUDSON: Boston was evidently asleep at the switch when the decision was made to bring LNG in. However, there is increasing public concern now about the risk of bringing a bomb like that into a tight harbor like ours.

W. BROBST: What sort of community disruption is likely to exist with LNG in Boston? Aside from peoples' concerns? What effect might it have on other cities?

K. STEIN HUDSON: While I am not a specialist in this area, I can give you my thoughts as a generalist planner. First, there are economic impacts which may, however, be offset substantially by the benefits of bringing LNG in. When one of the tankers moves in our harbor, no other shipping is allowed in the channel and the tankers must move in daylight and clear weather. I don't know what the costs are of other cargoes being stopped, but I suspect it is significant. Flights that might pass over a tanker as they go in and out of Logan airport, which is immediately adjacent to the harbor, also stop. Insurance people and economists are perhaps the best at putting a price on these risks and delays. There are other risks to areas around the harbor. Boston is a very densely populated city with peninsulas that are clustered around the harbor. The downtown is very built up and there are densely populated residential communities around the sides of the harbor. Besides the safety risks to all these areas, I wonder about the extent to which LNG shipment and storage will be a disincentive to future investments in these nearby areas.

How can a price be put on all these risks? What is the cost of blowing up Boston?

There are, as well, some serious issues concerning the transshipment of fuels from the port and on the highway network. We are contemplating putting into a tunnel a major elevated highway that runs through the heart of downtown. One of the issues we're looking at is the cost of disrupting the movement of energy materials. What is the cost of sending fuel trucks around our circumferential highway? How do costs and safety factors weigh against one another? Even though dangerous cargoes are now prohibited from tunnels, is it worth taking the risks of moving those cargoes through tunnels?

W. LOVEJOY: Can I make one comment? The concept of an off-shore island for urban areas where you can handle either the transportation or actually the use of what might be classed as dangerous energy fuels or energy sources may not be eventually so far out of sight either economically or strategically as it appears to be at the present time. You could envision some sort of an island set up 10 to 15 miles off the shore of any of the larger Eastern Seaboard cities where you could perhaps handle the receipt of and the translation of LNG into normal gas that could be piped to the mainland. You possibly could envision that as a site for nuclear plants. You could also use it as a site for picking up oil from supertankers and then finally as we all know the utilities in the north east region are having great difficulty finding sites for either new plants to replace the old plants, inefficient plants that some of them are now operating. Maybe the island could be used for that too so that this is a kind of an intriguing new thought that maybe should be investigated.

H. GAMBLE: Would these be islands or platforms?

W. LOVEJOY: The size that you're talking about they would probably have to be islands.

H. GAMBLE: We were talking about disposal of by-products from coal-fired plants, material that is literally of yellow tooth paste consistency and in vast quantities. In an average sized coal fired plant about a ton a minute is produced and must be disposed of. I saw an article last week where experiments are underway to solidify this and make it into blocks. This experiment, funded by DOE (Department of Energy) will haul the blocks from a power plant in Beaver Valley, PA, which is just west of Pittsburgh, and dump them in the harbor off Fire Island in New York to build reefs.

W. BROBST: They are!

H. GAMBLE: Yes, If you talk about the transportation of energy related materials, this is a by-product of energy generation that must be transported. Produced at the rate of a ton a minute from one plant and consider that we're talking about the increased use of coal, more coal plants, then we can appreciate the transportation logistics associated with that by-product. If it can be used as a base for those islands, then we're solving more than one problem at the same time.

QUESTION/COMMENT: The Island could grow! Like an amoebae.

W. BROBST: One way to handle that is for Congress to have a national LNG commission like the Nuclear Regulatory Commission who, with the way that they function, will prevent LNG plants from being built anywhere.

QUESTION: This solidified material - is that essentially sulphur and sulphur by-products?

H. GAMBLE: And flyash. The coal is ground into a powder before firing so you get none of the larger ash particles as we were familiar with in the old kind of boilers. The ash is all recovered from the flu stacks, it's scrubbed out.

QUESTION: Can this material be used also for building blocks?

H. GAMBLE: I think it has been tried but wasn't successful. It's a tremendous disposal problem.

QUESTION: All of these plants on an island, is this a drawback?

W. BROBST: This also raises questions of costs and benefits and equity tradeoffs of LNG coming into the port of New York or Charleston so that all of this gas can be passed on to people in Georgia and Alabama and elsewhere and why should the people in Charleston accept all of this risk of having this LNG coming into their city when they're not going to be primarily recipients of the benefits from that?

K. STEIN HUDSON: But in Boston that's not true.

W. LOVEJOY: Or New York

K. STEIN HUDSON: Harking back to a comment that Pat Student made in his presentation, I'm struck by the need for greater public awareness of the safety issues, and other impacts, associated with the transport of energy materials. There are three areas in which greater awareness is required. First,

awareness is needed on the part of public authorities who regulate or otherwise influence the transportation of energy materials. Second, the general public needs to be more aware of the issues, costs and benefits surrounding the shipment of fuels they use. We need to sort out where the facts lie on safety and cost, particularly to know better what to worry about and not. Finally, there are serious issues for communities immediately adjacent to shipment lines and transfer points. We and they need to be more aware of the special costs they pay and the special risks they are exposed to. With greater awareness in each of these three areas, we will have a better foundation from which the public can support controversial or major actions, as well as to say "no" to them when that is appropriate.

QUESTION: Five hundred people can obliterate or block any accomplishment; my initial reaction is to keep quiet in order to get something done.

K. STEIN HUDSON: The reactions to either keep quiet and act or to work to build public awareness are certainly warring instincts, and there is no neat answer to the question of how one gets the public active.

QUESTION: Is there any answer?

K. STEIN HUDSON: No! No single, neat answer, any more than there is one to the question of how we can keep a handful of private interests from making decisions presumably in the public interest when they are, in fact, not that way. We have heard, for example, of railroads buying out a coal slurry pipeline and the costs and pressures that resulted. There are any number of other examples. It strikes me that in the energy issue, as much as any other one we face, there is a very serious national controversy about who is making the decisions and in whose interest. Who is benefitting? Who is paying the costs? What are the equity implications of those allocation decisions? In what instances do the experts really know best? Am I, as a burner of oil in my furnace and of gas in my car, not competent to go beyond these choices and have a say in much more important, sophisticated decisions? These are critical issues, both when you look at the role of the public and when you look at the role of various private interests in these national decisions.

H. GAMBLE: I'd like to make just a comment in response. I think the adverse public reactions to new energy developments we observe today are in part an outgrowth of the environmental movement. People are much more aware of some of these costs and benefits that are imposed and the inequities stemming from how they're distributed. Some people gain in one location while some people lose in another. Sometimes these costs can be quite substantial. More importantly though, I feel people's anger over energy is an outgrowth of the fact that up until just recently our society and our economy has been developed based on energy that is way underpriced in terms of its true cost to society. Our whole way of living is geared to cheap energy; but we have not paid the real cost of that energy consumption to the world, to society at large, let alone recognized any distinct aspect of these costs. The people in Appalachia are starting to see such inequities, and saying! "Hey, wait a minute. I'll be darned if I want a coal-wash facility in the middle of my town." Bigler, Pennsylvania, in Clearfield County blocked the

Bradford Coal Co. this past winter from putting in a multi million dollar coal wash facility. The company had a 10 year contract pending for about \$250 million of metallurgical coal for South America. A handful of people blocked the issuance of a permit for the plant until they could come up and redesign the plant so as to eliminate some of the environmental effects. I think this is good. Those people deserve recognition. Too many of us think that we can go on and produce energy at the same old price but we can't. We've got to recognize that some of the costs that we were imposing on others by the way we did things simply can't go on. People will no longer remain silent. We've got to pay the piper. If this means and I think in some cases it must mean redistributing income through governmental means, then that may be one of the solutions to these problems. These people want to be rectified for some of the ills they are forced to bear. If you want to look at it crassly, you can bribe or buy them off to stop their protests, Isn't this really the same as compensating them for the environmental degradation they must endure? It all depends upon the perspective one has.

COMMENT: There is no way to compensate for an elk herd. At some time we have to move ahead.

W. BROBST: But can Congress, this Government, make the hard decisions (e.g., on gasohol)?

QUESTION: How do you trade-off decisions made on a parochial basis, in the big picture? How much local autonomy should there be?

H. GAMBLE: The decisions will be made.

QUESTION: W. Lovejoy suggested New York might need help because they have high energy costs. This regionalism is troubling. Does the panel have thoughts on this?

W. LOVEJOY: I think we all have a kind of schizophrenic point of view where we know that we have our own unique regional problems and yet we can all see the need for getting something done. And you even have that problem within regions. Con Edison Electric Co., for example, are being castigated for the fact that they allowed us to have brownouts and they don't have the ability to produce all the electricity they should; and yet when they try to find a place to put a plant, a few people can stop them because it affects their way of life or their well-being. But somewhere there is a point where the individual's complete interests have to be sacrificed to the good of either those in the region or those in the country.

K. STEIN HUDSON: I think there are clear inequities among regions of the nation on the energy supply - demand question. New England and Boston gobble up much more than their fair share of energy, at the expense of much spoiling of states where those energy materials are found and from which they are transported. However, just as we have expanded our look at transportation in the last decade to include social, economic and environmental impacts as well as transport-primary ones, we need to look at the ways regions have deficits and credits in other areas besides energy. For example, the Boston region is the great exporter, the great provider of medical expertise to this country and the world. Citizens all over the country benefit from what my region gives to them while it gobbles up more than its fair share of energy. We do this in the arts, and we do it in education; we do it in parts of the

electronics industry. We are certainly gobbling up more than our fair share in other areas besides energy, as well. This illustration points up the broad perspective that I think is required; otherwise, we will end up looking at each single resource, each issue and saying "give me mine first." That won't help us get anywhere.

W. LOVEJOY: This is an extension of the economic concept of specialization that we all accept, either on an international or a national scale. Every region can't be self-sufficient and shouldn't be. The problem is, how do you reconcile that with the individual interests in each region?

H. GAMBLE: With a change in the relative price of energy, that is, energy going up significantly in price relative to the costs of other goods, we might see some change. The change will not be drastic and it might take quite awhile, but there might be some changes in the production of certain goods in regions that tended to specialize. Some regions may become a little more independent; not completely independent, of course, that would be impossible, I'm referring to a very interesting study conducted at the University of Massachusetts recently called the METLAND study in which they examined the requirements for local production versus production in specialized regions for several different items. For example, to produce a gallon of milk in northern Massachusetts required 70% less energy than to produce a gallon of milk in Wisconsin and ship it to the consumer in Massachusetts. That takes into account the more efficient agricultural technology in Wisconsin. They looked at water and they looked at sand and gravel, and the energy savings are significant. With the price of energy going up so significantly, we could very well see shifts in land use. Agriculture in some form might be competitive once again in some areas. I'm not saying we will see overnight a regrowth of agriculture in New England, but it could come gradually and slowly. We could see some shifting in the interregional specialization of production based on just the pricing of energy.

QUESTION AND COMMENTS: Constitutional rearrangements; we can't wait 20 to 30 years. We have to give these needs priority.

W. BROBST: With that, I close this session and charge each of you to write to your congressman about this need to remedy institutional impediments.