# THE NEW REPUBLIC

## TNR/ON: AMERICA'S ENERGY CRISIS: WHAT'S VIABLE?

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(OFF-MIKE CONVERSATION)

RICHARD PARKER: Good evening. Thank you all very much for coming tonight to this evening's TNR/ON symposium on the nation's energy debate. We thank you all for taking time from your busy schedules. We hope that tonight you'll witness and participate in a lovely discussion, not just on the events that took place in New York, and throughout the northeast and the Midwest, but also on the national energy debate now taking shape in Washington, DC.

We have with us a great panel. A great moderator. And we thank our sponsor at the nuclear energy institute for their sponsorship in this series on the nation's energy strategy. With that, I'd like to introduce Joe Colvin, CEO of the nuclear energy institute. Thanks, Joe.

JOE COLVIN: Thank you, Richard. Good evening. It's a great pleasure to be here, and I thank all of you for joining us this evening. We're pleased to be co-sponsoring this event with The New Republic. And we're probably even more pleased that you all are here with us this evening.

Now, when we were scheduling this discussion, and trying to figure out the timing, we really had little thought about having a blackout that left 50 million people without electricity. And really prompting a review of the national grid, and our power supply and delivery system. So we're pleased to now expand the thoughts here. And I'm sure our panel will engage on some of these more thorny and difficult issues.

Now, we hosted a similar forum like this in Washington, DC, a few months back, where we had the Congress or the Administration trying to grapple with the National Energy Policy and legislation. And you know, typically our Congress comes back and re-thinks energy policy about once every decade.

And part of our thinking, in co-sponsoring these events, where really Americans in general, it seems, don't really engage on dealing with some of these very hard and difficult policy issues unless we're in some type of a crisis. Whether it's a disruption of petroleum supplies, or it's an issue where we have sharp increases of fuel costs. We've seen gasoline costs drive up in the past week or so. And things of that nature.

And so that's really one of the reasons we wanted to come here tonight, and co-sponsor this discussion. And talk about some of the important energy issues facing your state of New York, and facing the nation in general. And there are some really important issues that we have to grapple with ahead. And for example, just in New York within five years, the state projects it's going to have to add about 12 or so new power plants of some type. About 9200 megawatts of electricity, just to continue to meet the economic growth that's taking place in the state, and to maintain the state competitive.

And on a national scale, you know, we're looking at adding about another 40 percent of electricity to our grid structure, between now and 2020. To in fact take care of the increases in demand, and to insure that we can continue to compete in the global economic environment.

And as you know, that's going to be a difficult challenge. Because electricity is used in everything we do.

And as we see the growing import, the need to in fact increase the electricity supply at a time when in fact we have this great need for expansion. Those are really formidable challenges that take really some thought and energy. Some thorny issues in dealing with how we in fact pull all this together.

And we have to think about how to do this in an environmentally sound way, at the same time that we increase the electricity supply. We did a poll some time back, and it showed that 80 percent of the American public not only believed that we can have an increase in energy supply, but we can do it while protecting the environment. And the reality is, we not only can do it, we must do it.

And that's the challenge that we have going forward. So, we have a great panel here tonight, and I think we're going to have a lot of lively discussion. Get in some interesting issues. And I'll look forward to your engagement, and to the panel. And without any further ado, let me ask Michael to come up and take the podium, and kick up the discussion. Michael Crowley.

MICHAEL CROWLEY: Good evening. Thanks for joining us. I was thinking to myself as I trudged up the street and came in and cooled off in this wonderful room, that we take power for granted. And it's a joy not to be sweltering away. As I'm sure many of you were about a week and a half ago.

Let me just say at the outset, I myself am not an expert in the minutiae of energy policy. What I do for the magazine is cover Capitol Hill. So, I hope that if I can contribute something this evening beyond, making sure we have a lovely and-- productive debate, perhaps sheds some light on the nature of the beast that will actually wind up implementing some of the policies and ideas that we're talking about this evening.

Let me begin by introducing our panelists. Arthur Weasey (PH) is with us. And he is Vice President of Corporate Communications for the Entergy Corporation, where he's been since the year 2000, after a long career in public affairs and communications-- primarily dealing with energy issues. Arthur, prior to joining Entergy, spent 17 years with the American Petroleum Institute in Washington, DC, which is the trade industry for the multinational oil industry.

Carl Seligson is senior advisor to K-Road Management (PH), which is the parent of K-Road Power, which pursues investments in merchant-generating plants. He also advises the Edison Electric Institute on financial matters related to their member companies. And for 16 years, was an investment banker with Merrill Lynch, where he specialized in many things, including nuclear utility work.

David South is President of Technology and Market Solutions. His own company. A consulting practice that provides analytic, strategic, and regulatory advice on technology, market, and environmental issues to clients involved with electricity generation distribution. And has specialized in environmental and climate change questions associated with power generation.

And finally, Dr. Ernest Moniz, is Director of Energy Studies at the Massachusetts Institute of Technology, Laboratory for Energy and the Environment. He is a former Undersecretary of the Department of Energy, where he specialized in nuclear energy issues. Among other things, led a comprehensive review of the US's nuclear weapons stockpile stewardship program. Was special negotiator for Russia initiatives, with a particular focus on the disposition of Russian nuclear weapons materials. And has a long and distinguished academic career, specializing in nuclear physics issues. (CLEARS THROAT)

Well, there seems to be a division of opinion about why exactly the lights went out, two Fridays ago. Or was it a Thursday? (CROWD RESPONSE) Thursday. And there is a school of thought that says that the problem has been a race to deregulate the power industry. Which has left us with inadequate oversight, and no one really accountable for lapses in the power grid, which can create cascading blackouts. On the other hand, there are people who believe that deregulation's not gone far enough. And the power industry needs more incentives. More of a sense that they can turn a real profit by upgrading our power grid infrastructure.

I noticed, just checking the wire before I came over here today, that there's a new study out from the Electric Power Research Institute, warning that upgrading our electrical grid nationwide is going to cost $100 billion. So, I suppose one way to open this conversation about this rather broad subject is to ask our panelists, what did we learn from the blackout?

If you can boil it down in this way, is the problem that we have deregulated too far? That we have not deregulated enough? Or that we are caught in this sort of transitional moment, where we're neither here nor there. Or, do any of those categories apply? I will let anyone who wants to jump in, get us started.

(OFF-MIKE CONVERSATION)

CARL SELIGSON: All of the above. Is that an appropriate answer?

MIKE CROWLEY: That's fine.

CARL SELIGSON: From a financial point of view, the Wall Street community believes, and I have documented publications from a variety of major firms that have written on this right after the blackout, that A, there was a significant underspending on transmission in the last ten years or so. B, that the blackout itself, and they make no judgment as to the cause. But the blackout itself will be hopefully impetus to get something passed in Congress. C, that it's been a large amount of squabbling, between particularly the Southeast and the Northwest, versus the Federal Energy Regulatory Commission, and what they wanted to do.

And D-- investors aren't happy with uncertainty. Which you could say about any business at any time. Investors would prefer some degree of certainty, before committing their dollars. And clearly, the low returns that have been allowed and earned on transmission, compared with what looked like obscene profits that could be earned from deregulating generation, helped to move this dollar for investment that many companies made, into generation.

So that in fact Joe mentioned the future need for a generation (UNINTEL)-- there's no question about that. But at the present time, there's an overabundance of generation capacity. So, I think the blackout, if you can say that anything that discomfited as many million people as it did.

And by the way, we're going to have to look at this in detail. This is a satellite photo taken Thursday night. And this whole black hole in here is the area where there was no electricity.

The disruption clearly has brought this issue of energy policy and of transmission investment to the forefront. How long it stays at the forefront is anybody's guess. Clearly, it will have something to do with what Congress does or doesn't do when they come back.

And I recall very, very vividly, waiting on-line to buy gasoline. And several other things of that kind, so that clearly some kind of crisis does tend to motivate people to some kind of action. We'll see if the action is adequate, and goes the right way.

ERNEST MONIZ: Could I could take a step back, and make some comments of prologue. Perhaps first with my academic hat on. And then later I'll move to the political hat. Couple of comments. And eventually I will come back to the question. One is, I think it's a useful context, to think about what the National Academy of Engineering did in 2000. Last year of the century. At least by some counting. They decided to publish a list of the Top 20 engineering achievements of the 20th century.

And I think if each of us, including myself, before the announcement was made, started to think about our, let's say, top one. I'll bet most of us would be inclined towards, as I was, computers. Lasers. You could say something like space travel. But the answer was electrification. They said, the number one engineering achievement of the 20th century was electrification.

And there were two lessons in that. One is, as has already been alluded to, electrification is such an important determinant quality of life. So, it's an engineering achievement that touches everybody all the time. And secondly, it reflects something that very few of us ever think about. What a complicated, enormous machine it is.

Because electricity, the power plants, the generators, which may by big thousand-megawatt plants, nuclear or coal plants. It could be smaller gas plants. It could be a renewable, wind farm. Connected to an amazing transportation system. High-voltage transmission units. Connected in a funny way-- not so funny last week. In a complicated network. Coupled to a distribution grid that takes a load voltage, so you don't fry yourself every day-- 110 volts, for example, coming into your house. Coupled to your loads. Your air conditioner and your lights, et cetera, et cetera. Industry, of course, loads (UNINTEL)-- all of them having to operate in synchrony all the time.

We don't think about that with a flip of the switch. And that's one reason when the-- and I mention that first, to say that I think in our discussion, Black Thursday is very important. But the discussion is not only about the transmission line, but about the system. The power plants, the transmission distribution system. And the loads.

And hopefully later on, we can talk about what a serious integrated policy is, in terms of addressing that global system. Now, having said that. I think most would agree, and would have said even before Black Thursday, that if you wanted to pick the weak link today, it is the transmission system. Which, although we don't have the final blow by blow of what happened on Black Thursday, I certainly would be extremely surprised if it didn't start out with essentially cascading of transmission line faults.

Although coupled perhaps to where the supply was. In fact, I should make one more point as prologue before we go on. Where the generators are, with regard to the transportation system, can make a big difference. Just difference. Just like a highway system. You have to look at points of congestion, et cetera.

And so, where plants are placed is another aspect of perhaps how a national energy policy should go. Having said that, given that little prologue, let me go back now and dispute part of Michael's phrasing, earlier on. The race to deregulate. First of all, I think it's very important at some point for us to get away from the incorrect use of the word-- and by the way, you didn't invent this, Michael. Deregulation. No one's talking about deregulation.

One is talking about restructuring the regulatory framework, to represent and allow, facilitate, a competitive market set of transactions. So, it's really a different form of regulation that was being proposed. The second problem is the word "Race." That's actually the problem. There was no race. The starting gun went off in 1992, with the last major energy legislation through Congress. The so-called EPAC (PH), the Energy Policy Act. It relieved certain restrictions on-- on access to the grid.

So, the independent power producers who thought everyone would make lots of money (LAUGHTER)-- in fact, were allowed to get on the grid. And the problem was-- this was the third of your options, Michael-- and the problem is, once we get started, there's been an awful lot of, "Oops. Well, maybe we don't really wanna go there," in different parts of the country.

As a result, we have a system that intrinsically spans a huge geographical region, which, it may not work. (LAUGHTER) Don't raise your picture. Which that picture very graphically shows, of the blackout, spanning a huge region. Because they're all coupled. They're all linked. And yet, we do not have any rules of the road for governing the system across commensurate geographical mountains.

Now, I'm on the side that says, "We frankly can't go back. Too many eggs have been broken. But it is serving the case, that we've got to finish the job one way or another. Decide what the rules are. Are we going to have regional organizations or not?" We can go back to what that means in more detail. Are they going to have reasonably similar rules, or are we going to have the patchwork, whereby we ask questions like, "Did an operator from the first energy territory telephone in time, an operator in some other territory?"

Hello. The fact that we are asking that questions is ridiculous. This system, that was the number one achievement of engineering in the 20th century, because of what it means to people, in an

age of technology, we're asking the question, "Did somebody pick up a phone in time, and call across to warn somebody else?"

You've got a very sick system, that needs resources and will to fix. Maybe we'll come back later. With my political hat, I'll be happy to address the question, politically.

ART WIESE: Well, I would agree with some of the things that the Professor said. Number one, certainly I agree with is the importance that electricity has played in the 20th century. And then now, the 21st. It's changed everything. It really is modern society. It's hard to imagine anything approaching what current civilization is, without electricity.

There are not very many of us in the room who are old enough to remember, or grew up in a sufficiently rural setting, to remember when the Rural Electrification Administration came through rural parts of Appalachia, and the south, and the southwest. And brought electricity in the 1930's, to places that were literally operating by candlelight still, and kerosene lamp.

My mother, who is now God bless her, 84 years old, remembers how it changed everything in her life, in a small town in Texas. She still talks about the night the lights came on, as though it was the essential equivalent of the discovery of fire. There's been a lot of speculation-- not just about the cause of the blackout, but what the ramifications of the blackout were. And there've been some things said that I frankly think are pretty ludicrous.

I'm really surprised that some of `em have been said by the Governor of New Mexico, who's the former United Nations ambassador. Someone with that kind of background in international diplomacy, I would have thought would have been far too steeped in what traditions really are, in the developing countries, to have ever said that the United States has a Third World transmission system. Anyone who's ever seen the flickering lights, and almost constant power disruptions that are occurring in really developing Third World countries in Asia, Africa, and Latin America, knows that this is an extraordinarily reliable system, by that comparison.

I do think that the question of deregulation is one that does play into this debate. It is not the simple solution that people want to point to, as why this all occurred. But again, as you remarked, we have sort of a trifurcated situation at the moment, with about 20 states that have deregulated. Some of `em have required that when the transmission assets of the old monopoly utility companies were sold, that a strong central independent system operator was appointed, who really had authority over how the grid operated. And New York would be an example of that.

In the Midwest, you have independent system operators, who are who are the same role, but have a vastly smaller amount of authority. The decisions are still really made by the utilities. And then you have half the states that are not deregulated at all, and where the transmission system is run by individual corporations.

So, that kind of polyglot solution is obviously going to cause some problems going forward. And at some point, we're going to have to make a collective decision in this country about

whether we are going to be regulated, or we're not. We seem to be operating on a local option system, which which has some shortcomings in it.

MICHAEL CROWLY: Well David, let me bring you in with a fresh question, which is to get you to talk about some of the specific proposals that are on the table in Congress right now. There's been sort of a classic muddle on Capitol Hill, an energy bill, that went nowhere for about two years. Republicans wanted to pass it in July, I believe. They had a bill they were trying to get through. They failed. And just picked up an old Democratic bill that passed the year before, gaveled it through, and said, "We're going to go ahead and rewrite it in conference." So, we have sort of classic Capitol Hill machinations happening here.

But there are some particular ideas on the table now, involving the role of FIRQ (PH), and also regional transmission groups, if I have the terminology right. I wonder if you just had any thoughts about what you think Congress will do, and what it should do, in response to this. Is this an appropriate time for them to try to do something quickly? Which is something they will feel political pressure to do? Or do you think we should give it some more time, or there should be some different options on the table that aren't there right now?

DAVID SOUTH: But that particular topic is not my forte. But I do track a number of those issues. But I would guess, as you all know, because you track the Hill, that you can't predict anything that's going to come out of legislation at this point in time. Especially since they've gone back now, and are starting with an earlier piece of legislation.

But there's a lot of things that are open for debate. I think the fundamental question is whether or not you're going to get a holistic bill, to cover all the energy issues, or it's somehow going to be divided to address more the critical issues right now, which, in the forefront, is the transmission issue. And the political will there, to determine whether or not-- that's going to be protected independently from the rest of the bill, or if they're going to try to tack it (UNINTEL) poll. So. (UNINTEL)

SELIGSON: I think David is quite right. A, we can't predict what they're going to do. However, I would say that if you look back at the history of the proposed bills, and of the differences between what the Democrats and Republicans, or the House and the Senate, if you would, there are certain areas that don't look to me as a interested observer, not as a political guru, to be compromisable.

Whether or not we're not drilling in the Alaskan National Wildlife area is not a compromisable issue. The question is whether that has to be in a bill, to get a bill passed. Or whether their will be eliminated from the bill.

The same for something like the automobile fuel economy standards. Same floor. And then the other bill, of course, has to do with the environment. And there's a whole dispute there, as to whether or not it covers three polluters or four polluters. So, all I'm saying is that this is now a hot issue. And I do predict that there will be something passed in this session of Congress that relates to (UNINTEL) industry. I won't tell you what it is.

WIESE: You're probably right, that the blackout has been a catalyst for action in that area. But I would say, having lived 30 years in Washington, myself, don't put too much faith in the willingness of either politicians or the American people, to make real trade-offs when it comes to this question of energy and the environment. We have now, for over 30 years, really avoided as a culture, making the difficult trade-offs that are necessary to make this work.

The transmission system is just one, where we have been unwilling to look at the question of how we provide an even more reliable electricity system, while at the same time we allow local communities, and sometimes just local pressure groups to block the siting of new power plants. To block the siting of new transmission lines. We don't want to make those kinds of trade-offs, if we can avoid it. We don't want to make trade-offs on replacing foreign oil, as much as we need to do that for environmental reasons, and geopolitical reasons, as well. Because that would mean drilling for natural gas, the logical alternative, in many of those places that are sacrosanct to the environmental movement, like off the Atlantic and Pacific coasts.

On the other side of the equation, we don't want to make any hard decisions about things like renewable fuels. Certainly the Green Lobby has been advocating renewable fuels forever. Well, on the one side, a wind farm off Nantucket Sound, however, many of the people who are most associated with arguing for a clean environment, like the Kennedy family, like Walter Cronkite, have been absolutely opposed to putting that wind farm there. Apparently wind energy is good, as long as it doesn't block my expensive view of the ocean.

You know, we could do a lot more with fuel standards, if we had the willingness to do it. But we're not willing to give up SUV's. We could do a lot more to address the climate issue. Certainly, if we were more supportive of nuclear power. These are just trade-offs that this society seems to have an aversion to making. And until we're really serious about those, I'm not sure that any bill is going to make any breakthrough difference in our energy situation in the United States.

MIKE CROWLEY: Dr. Moniz?

MONIZ: I think that as far as the bills go, there are a lot of side shows. Like ENWAR (PH) drilling in the Arctic. Which frankly, at the end, are not issues that are going to stop in any way, or help, the serious legislation that's being discussed. Now, the electricity title, in my view, would once again either have blocked the passage of the energy bill, or would have been dropped before the blackout?

Just maybe as a point of information, so that you know. This electricity business-- earlier, I think Carl was the one who mentioned it. Or perhaps it was Michael. I forget the enormous tension over the last many years, between FIRQ (PH), and particularly, some leaders of the country. Just to indicate how serious this is, in my last year in government, in 2000, a very unusual situation that occurred, in which the Chairman of the Energy Committee in the House, and the Chairman of the Subcommittee dealing with these issues really got into public feuds.

It is such a major political thing. And I want to stress that by definition, those are the same party. In that case, they were both Republicans. I want to stress, these are far less partisan issues than they are regional issues. And that's really what drives it. So, now what's going to happen? I think the same way politicians, two years ago, one year ago, could not pass a bill because there was such a lack of anything approaching consensus-- this year, they cannot not pass a bill, because people are going to be looking for action.

So the question is, what compromises get found? To me, I think for most of us, it's a no-brainer now that mandatory reliability standards are everybody's favorite. So, that is already probably enough to say, "We've done something." There will probably be some additional financial incentives for new transmission capacity. The House already has that in their bill. They'll probably be something.

This is where, now, the real love comes. In the sense that those incentives may or may not be meaningful in terms of actually resulting in action. And there, we can have a real debate. Some would say, and Carl would have a good perspective on this from his financial background, that until there is some more certainly about the regulatory future-- some kind of rules are wrote-- no matter what they are-- but some kind of rules are wrote-- incentives may not have nearly the impact today that one would hope.

So I think, frankly, that's likely to be what come out. It will be kind of the minimum, noncontentious-- helpful. I mean, don't get me wrong. I think it's a positive stress. But it's not going to be addressing the fundamental issue underlying this whole restructuring.

Before I get off the microphone, however, I must go back to something earlier. Something Art said, about the Honorable Governor of New Mexico. My dear friend. I would like to say, I disagree completely with what Art said, in terms of characterization, about his comment on the Third World grid. I'm not talking about a technical argument. Because actually, a few Third World countries probably were insulted by that comparison. And of course, on the other hand, so-called Third World countries. On the other hand, obviously we're far more advanced in the grid and other things, than other Third World countries.

But I think, you know, look. Bill's a politician. And that sound bite got across to a lot of people the idea that we've got a lot of work to do on a grid that fundamentally is working on decades-old technology. When a lot of new technology is needed. Now, he didn't add the part about the cost. (LAUGHTER) Okay? And that is going to be, if we're serious, whether it's 50 or $100 billion over ten years, I'm not going to argue-- but it's a lot of money, to address the capacity.

But I do want to say one last time-- and I hope we can get back to it-- that if we focus only on the "easy thing," how do we increase capacity of the grid, we will not have gone to a systemic solution about how the generators and the transportation system and the loads all need to be discussed, to have an economic, environmentally preferable and secure system.

MICHAEL CROWLEY: David, did you want to add something?

DAVID SOUTH: Yeah. I mean, I had the opening, I guess, from the initial question. And I answered what I thought was appropriate. But since my comments have opened the door on this issue, let me--

MICHAEL CROWLEY: Let it rip.

DAVID SOUTH: Not only do we have an energy bill, but we also have a number of environmental pieces of legislation. Clean Air Legislation, that are also being proposed. And as we heard, or as you've heard, that there's conflicts in some issues inside the Energy Bill. We have a major conflict between the Energy Bill, whatever it is, and the piece of environmental legislation-- actually, three bills that are there contending for attention right now.

Because we're talking about increasing supply. In many cases. And try to meet load. But at the same time, we have a major division in how we're going to reduce our emissions, which largely comes from fossil fuel sources. Nuclear power holds an opening there, in the sense that it's not only a reliable source of power, it's (UNINTEL) power. And it's also emission-free, with respect to all the air pollutants, and carbon emissions.

So, if we're going to solve an energy problem, I think we ought to look at stability of supply. And recognize, as you said, it has to be environmentally preferable to us. And so, we need to possibly couple those two pieces of legislation in some way. So that there's a recognition that we're not just promoting an alternative that meets part of our requirements, but negates the other part. Which is, how do we provide clean air, and avoiding health concerns that arise with smog and ozone, that arise during the summer months in the urban areas?

MICHAEL CROWLEY: Well, I'd be interested in hearing more what you all have to say about nuclear. Pete Demenici (PH), who is Chairman of the Senate Energy Committee, had initially proposed about $15 billion in subsidies for nuclear power in the Energy Bill, which was scrapped. And it is now unclear whether those subsidies can be put back in, in the House-Senate conference. But it seems possible. And one does get the sense that Congress is less and less hostile to the idea of nuclear power.

Yucca Mountain (PH), the storage site for nuclear waste was approved last year, or the year before. Do any of you have any thoughts about what is likely to happen, and what the effect of subsidies on that scale would have on the industry, and therefore how that would play into the broader questions that we're talking about?

MONIZ: Well, at MIT, we just finished a two-year study on the future of nuclear power. By the way, if you're interested, it's on the web at MIT.edu/nuclearpower. And our report-- frankly, we view ourselves as a group as neither pro-nuclear, or anti-nuclear. We were just studying the role nuclear power could play as an option, particularly for addressing climate change. And that's a story I'd love to go into in more detail.

But for the moment, let me stick to your question about Pete Demenici's proposals. First of all, I cannot agree with David's statement that nuclear power is the cheapest. At least not when it is a statement made about building new power plants. Today, nuclear power, with amortized nuclear power plants, is very, very inexpensive. Very reliable. I mean, a tremendous base load source, providing 20 percent of our electricity. And as was stated, with essentially no atmospheric emissions, be they smog or acid-rain-driving pollutants, or planet change.

However, we did an analysis. A market analysis, as a merchant plant model, of building new plants. Natural gas, coal, and nuclear. And based upon experience, and not upon dreamy ideas of how good it's going to be tomorrow, a new nuclear power plant, levelized costs, would be significantly higher than those of gas and coal.

However-- there are several however's here. Number one, we believe that some of the cost reductions for nuclear are plausible, but need to be proved. Twenty-five percent reduction in capital cost. We believe it's plausible. But it's not been proved. There were some indications in Korea, for example, their recent plants, that we may be able to get there. Very important industry.

Number two. Natural gas, as many of you know, at least for the next 15 or 20 years, has got a pretty scary cost profile. Very volatile. It was great when gas was $3 for a million VTU's, or 1000 cubic feet, whatever you want to count. And that's why everybody wanted to build gas flats. The capital cost is much lower. They're clean, they're great. But the natural gas costs are a real problem. And natural gas supply, especially domestic supply, is again a subject we could come back to.

It is a critical subject for discussing how the power sector evolves, and how our industrial sector evolves. Because natural gas not only is good for power, but it's very critical. The chemistry industry.

The third factor, which is why in our report we argued strongly for maintaining the option of potentially dramatic increases in nuclear power-- is that-- it was our group's belief that first of all, we really must begin to address the issue of global warming and climate change. And we are convinced the United States will eventually join other countries in doing so. That means the cost of carbon emissions, one way or another, is going to be internalized. Unless internalized, the cost equation is quite different.

So, if nuclear can do, in fact, the plausible reductions in cost. And if we begin to pay for carbon emissions in one way or another, the way we pay today for-- you know. For reducing sulphur emissions. Nitrogen emissions. Particulate emissions. Maybe soon, mercury emissions. If we have to pay for carbon dioxide emission avoidance, that cost equation begins to look very different.

So we, then, advocated something as a incentive to see about whether we can build nuclear power plants in this country economically competitive. It was a very different proposal from Senator Demenici. So, as Demenici proposed a loan guarantee, we proposed a production tax credit for some first set of nuclear power plants built with modern technology.

The production tax credit would have a lot of attractive features. First of all, you get nothing if you don't produce electricity. Entergy, or somebody else, might start a plant. Take the loan guarantee, and default. You pay, you get nothing for it.

A production tax credit. Just as wind power has today, could be a very good incentive for a small number of first plants. Indeed you see a production tax credit can be technology-neutral. We would argue, do it in the appropriate way, for all carbon-avoiding technologies. Wind, nuclear, coal, plus carbon sequestration. That it's a more universal way to say that we are committed to looking at carbon emission reductions.

SELIGSON: I'd like to jump in here for a minute, on the question of cost. I think Ernie has laid that out very well, by saying that (UNINTEL). And that's all very true. I have testified in many proceedings in various states, and at the federal level, on investor expectations and what it takes to keep a company working properly. As far as return is concerned. As far as the rates that are charged, to their rate-payers. To their customers.

And there's an amazing amount of opposition to any change in electric rates. I remember very well during President Carter's days-- I don't know how many of you are old enough to remember President Carter. But, there was something established called a Price Commission. And the only thing that was complained about to the Price Commission was the price of electricity.

Now, I've always learned that bread was the staff of life. And bread had gone up by something like five times as much in the same period as electricity had. But nobody complained about the price of bread. They were complaining about electricity because you always have (UNINTEL) to complain about electricity. Electricity is a regulated commodity. (UNINTEL PHRASE) go the a public service commission wherever you (UNINTEL) and say, "I don't want pay higher rates," and lots of people did.

As far as I'm concerned, it's not a matter of residential customers. Electricity is a tiny fraction of (UNINTEL) spending money. So that's not (UNINTEL). I mean, that's really not an issue. The (UNINTEL) issue with major industrial customers and a major lobbying group who represent major industrial customers in my opinion as (UNINTEL) as possible for driving this whole, you didn't want to call it deregulation. Call it what you will.

Restructuring which in some cases is clearly (UNINTEL). Ask people in California. Ask people in Montana what they think about restructuring. And it was driven by industrial customers who saw that because it was a significant portion of what their cost of doing business was. But (UNINTEL PHRASE) in working on the transmission lines or whether there's a production tax credit or a loan guarantee, this is still a small drop in the bucket relevant to the solving of these problems.

I say that the traditional investor in electric utilities in this country will be there with their checkbooks if they can see that there's an appropriate return to them for (UNINTEL) they invest. And that's the same as anybody else. (UNINTEL PHRASE) on the basis of getting what they think is going to make a profit, making a profit. And that doesn't matter what the business is.

CROWLEY: And how do we guarantee them that return?

SELIGSON: Sorry?

CROWLEY: And how are they guaranteed that return?

SELIGSON: How? They're not guaranteed. That's another fallacy. The return is not guaranteed. Their return, the ability to earn the return is what's guaranteed. If you do the right thing you could earn a return. Now, Entergy (PH), for example, went out and built a lot of nuclear power plants from people who wanted to get out of the business, did get out of the business, and bought them for less than what it costs to build them. That's a no-brainer. That's what my associates at (UNINTEL) are trying to do with other power plants, not nuclear.

WIESE: But we'd love to find some more.

SELIGSON: Of course we would. Nobody wants to sell at these reduced prices. But I think the key to this whole thing is that the investor, (UNINTEL PHRASE) investors will be there if they are not restrained or constrained by a variety of regulatory policies which don't allow the companies in which they're investing the ability to have the ability to earn a fair return on the investment.

And Art mentioned before that people were opposing wind power because of it being (UNINTEL PHRASE) being in their backyard and supposed (UNINTEL PHRASE). Friday in the newspaper where he admits to being (UNINTEL) not in my backyard. I've met lots of people who are (UNINTEL) build absolutely nothing (UNINTEL) anything. So that's really (UNINTEL PHRASE) after I saw that article (UNINTEL) address the costs. Address what that (UNINTEL).

That windfall is not economically viable without production (UNINTEL) or without (UNINTEL). So we're already paying somebody to do build it. And those people (UNINTEL PHRASE) financial (UNINTEL).

CROWLEY: Let me ask you all, and David maybe this is something you can speak to or if there was something else you wanted to say you can ignore the question. But is there perhaps a more heavy-handed, sounds disparaging, but more forceful approach the government should take? There are some people who believe that the government should have more eminent domain freedom to basically swat down NMBE (PH) objections and allow transmission lines and other equipment to be built breaking through the typical kind of community objections and hang-ups. Is that practical? And is that something that you or anyone here thinks is a politically feasible and worthwhile step?

WIESE: Well, politically feasible is different than whether it's worthwhile. Politically feasible, it's hard to imagine successfully getting through Congress legislation that we give (UNINTEL) or anybody else sweeping powers to overrule all objections. Whether that's worthwhile, however, is (COUGHING) something we really need to look at.

If you look just to the north of the city here in Westchester County where there has been a lot of concern about the security of our two nuclear plants, many of the people who are opposed to the continued operation of the plants are also the people who don't want to bring the Millennium (UNINTEL) Natural Gas Pipeline into the county. Who are going to get almost every other form of (UNINTEL) of fossil-based electricity (UNINTEL).

And it gets back to the point I was making earlier about our unwillingness to, in this culture, to make our trade-offs. We are perfectly willing to give up the things we don't want but nothing else.

SOUTH: You just need to take a survey now of the people who went through the blackout, especially here in New York, about where they were stuck and what the problems were about not being able to take mass transit or the trains to the various homes. And they had to walk to get to the various ferries and the wait for hours because they were so crowded. And ask them now how important is reliable electricity to them.

And whether or not they'd be willing to then have a power plant a lot closer that they're not importing power from such vast distances to get it into New York which is what (UNINTEL) cities to import power from outside the region. That's a vulnerability you have. And yet you have power plants that are basically in the jurisdiction who couldn't even carry the (UNINTEL) power to you to maintain all the services that you're accustomed to.

But there's great in-fighting about whether or not those power plants should be in that location and should continue to operate. You know, I would think that the public opinion would help (UNINTEL) if people realized how important it is in their life (UNINTEL) point forward. Operating elevators, running the trains, your daily necessities (UNINTEL). I think you can take this (UNINTEL PHRASE) realizing what an important thing it is.

And perhaps recognizing what the (UNINTEL PHRASE) are needed. Maybe additional supply where the (UNINTEL) areas are another solution so they don't rely so much on the transmission grid which has its own vulnerabilities. There's movements to look at distributed power sources which are locally provided. In fact, I guess the stocks for a (UNINTEL PHRASE) 20 percent the day after because it was recognition that perhaps that might be a source of power for the future.

But I think, you know, the small sources (UNINTEL PHRASE) global areas. And you still have a lot of natural gas in those gases to be the primer mover of those technologies. And the ones looking at vulnerability of our various transmission systems I think actually the natural gas pipeline is more vulnerable in many ways than the electric transmission grid because it's very difficult to reroute transmission lines. You have major (UNINTEL) lines coming into an area. So if there is, like they had in I think it was New Mexico or Arizona, they had--

MALE VOICE: New Mexico.

(OFF-MIKE CONVERSATION)

SOUTH: New Mexico, the natural gas pipeline (UNINTEL). They couldn't deliver natural gas to southern California which drove up electricity prices and services there because there's no other way to move natural gas (UNINTEL) into southern California. So the transmission grid just has some options to move power around in a situation that the (UNINTEL) didn't permit that this time.

But there's been a lot of other more minor situations that have allowed power to move. So we have to look at all the dimensions of the various power sources. Both the supply of the (UNINTEL PHRASE) technology, the distribution of the electricity once it comes out of the power plant all the way into our homes. And look at all the various costs and environmental attributes and the security issues now that are associated with (UNINTEL) supplies.

(OVERTALK)

SELIGSON: I wonder if you could arrange to shut off the power to all of the people in Westchester who object to (UNINTEL) nuclear power plant there? (LAUGHTER) You know, just one day a week and see how long it is they're going to continue that objection.

(OVERTALK)

MONIZ: Art mentioned both the power line and the gas pipeline, going back to your original question, Michael, about the eminent domain. I just note that the federal government kind of strangely does not (UNINTEL) have it for power lines. And that, of course, for the most part the President's energy plan in 2001 which I do believe is (UNINTEL). But the government does have eminent domain for natural gas pipelines.

And I would just note that the consequences of that don't seem to be so terribly great. (LAUGHTER) So, frankly, I think the political damage done by eminent domain for power lines, I don't see the evidence of it being the solution in any case, frankly, because you could still stop things if people don't want them. And I'm not so hard on people not wanting them. I mean, frankly, let's face it, it's not the most pleasant thing.

Now, however, we can do a lot more of opening up our current coverage to have much greater capacity. And then we have to work on distribution. And as David said, while not a solution, we could also try to address the regulatory problems that exist not only for the transmission lines but the regulatory problems that exist often in blocking very sensible high efficiency distributed generation projects on the distribution lines.

All of which, again, ties together in this system, okay? So I think the reality is there's a lot of stuff that we can do with some resources, clearly, with existing technology that can really relieve constraints for quite some time. And that's even before getting to the (UNINTEL PHRASE) this thing a couple of weeks ago. And it's a tremendous vision. It's a long way off.

It's very important we start working, I think, in the short term on those pieces that can make a real difference in five, ten years. And there are things that we can do along those lines both in the transmission side and in the distribution side. David?

SOUTH: Yes, I think that's a very important point. And going back to something that Art said about the rate of return. That it's not guaranteed. That you have the opportunity to earn a better rate of return. And what (UNINTEL PHRASE)--

MALE VOICE: I think (UNINTEL) a couple. But I think you're right.

(OVERTALK)

SOUTH: Sorry, sorry.

MALE VOICE: Notice, he was (UNINTEL PHRASE). (LAUGHTER)

(OVERTALK)

SOUTH: But I think one of the things we have to look at with some of these more capital intensive technologies or options is not just getting the option to earn a greater return. But it's also the timeline in which (UNINTEL PHRASE). But the pay off is very (UNINTEL). Three years, in five years or thereabouts is pretty fast because it's a low capital intensive technology.

But (UNINTEL PHRASE) for instance or even a new coal plant (UNINTEL) coal plant is enormously capital intensive (UNINTEL) a lot more time to earn that money back. (UNINTEL PHRASE) financial community today is very short (UNINTEL). They want to reduce their risks that (UNINTEL) exposed. And they don't want to invest it for long periods. And they want the higher return but they want it fairly quickly so they can roll that over again and reinvest it.

And perhaps we need to look at some ways in which we take a longer term perspective, way in which the regulatory community (UNINTEL PHRASE) and building a mix of technologies in. And in a (UNINTEL) environment, unfortunately, we have a (UNINTEL) and we're not considering all the factors that we may need to consider (UNINTEL PHRASE) concerned about putting a plant in (UNINTEL PHRASE) and to produce power. But we're not necessarily worried about what ramifications it may have in five years or ten years really in terms of the environment. And yet that's an important dimension that we need to look forward to. Otherwise, we'll have a lot of stranded assets and misused capital that could be more productively (NOISE) (UNINTEL) used to benefit the total society.

SELIGSON: I think (UNINTEL) perfectly right. I (UNINTEL PHRASE) on everything that's been said. But, clearly, all the discussion that we've had this evening about the future we are talking about years off. Other than the things that (UNINTEL) mentioned. We're not going to have new power plants that are built tomorrow.

We're not going to have fixes to the transmission grid or a new grid established in the interim. So we damn well better build short term things or it won't be that we have a blackout every ten

years. It'll be there's a blackout with more frequency. And this whole concept which I guess we mentioned earlier (UNINTEL PHRASE) telephone to call somebody else and say, "Hey, we're having a problem. Please, why don't you shut yourself down," is one of the things that (UNINTEL) was some kind of (UNINTEL) warning system.

I don't want to make any technical judgments, number one (UNINTEL PHRASE). And number two, everybody in the world's now having an investigation just like everything else. The good thing about those investigations is that most of this stuff is documented in the individual records of the companies to (UNINTEL). And they have records come out of your ears. (UNINTEL) second by second and (UNINTEL PHRASE) future blackouts has initially put out a whole series of press releases where this happened at such and such a time down to the second.

So they've got that information in various plants. (UNINTEL) has come out recently with some release of the same kind. So the information will be there (UNINTEL PHRASE) what failed and why. But we're talking about (NOISE) (UNINTEL PHRASE) and we've already been through that. And we will continue to go through that in various (UNINTEL).

The point is you can't have a failure (UNINTEL) Place A that affects somebody who's hundreds of miles away. You have to build a fence around that. And I think the technical ability exists.

CROWLEY: Well, it's not a (UNINTEL). One of the key issues at least of the debate is sort of playing out in Washington as I see it, it seems to revolve around the role of FERC (PH). And I wonder if those phone calls that didn't happen the way they should have or didn't get made or weren't communicated, is that something, is that a ball that FERC could pick up? And is there something that Congress could do this fall to give FERC new powers that might have prevented a situation like we had a couple weeks ago?

(OFF-MIKE CONVERSATION)

MALE VOICE: You're the government expert.

MONIZ: Former. Former government.

MALE VOICE: Excuse me.

MONIZ: Well, first of all, as I said earlier, I think that Congress will pass some things like (UNINTEL) liability standards that will be (UNINTEL). I don't think Congress is going to give FERC in this round new authorities. Part of the problem is, frankly, that I think not quite ready for it. I personally believe that FERC-- I don't see how this is going to work in the end by FERC being given some new authorities and I would guess in 2005.

FERC, by the way, is headed by a man named Pat Wood (PH) who was brought by the President from Texas where he did an outstanding job. But actually, those of you who don't the architecture, however, Texas, only one of the ways in which Texas is special is that it has its own grid. (LAUGHTER) Which is largely uncoupled from the rest of the country.

So there's a certain kind of (UNINTEL PHRASE). Pat Wood decided that, as we said earlier, the rates got started with the starting (UNINTEL) and then kind of stopped. And Pat Wood I think correctly recognized that this kind of ongoing no-man's land with a patchwork of rules was not very sensible. Investment wasn't happening. All kinds of (UNINTEL).

He put out something. Well, it's kind of out there in perpetual draft form I guess. Something called Standard Market Design. That was a rather bold suggestion for essentially taking the model that's used in Pennsylvania, New Jersey, Maryland and making it a national (UNINTEL). That came with a strong push back. (NOISE) I personally believe that literally it was too big a stretch.

And I also believe and I'd be interested to hear (UNINTEL) view, for example. I believe that fundamentally the cards are on the table for a deal. You don't quite have it yet. But the deal is something like the original concept of required regional transmission organizations. And with the FERC requirement being able to guarantee a proposal assures non-discriminatory access by all generators does have some modicum of operating requirements uniformity so that the seams between different organizations are not (UNINTEL).

But yet allows some reasonable degree of regional tailoring of how the organization works. Because the fact is it's easy for us here in New York or Boston or whatever to say, quite correctly, the Southeast and the Northwest are the most opposed to the four proposals. But the other part wasn't added. There are genuine regional differences that lead to that. It's not an ideology, you know? We like having (UNINTEL) cheap federal power in the Northwest from (UNINTEL) Dam, for example.

So, I think the deal is kind of out there to be had in terms of FERC getting some new authorities, having the basic template put in but with a lot more regional flexibility than was originally placed. And I think it's going to take another, next year probably isn't the year to do it with an election going on. So I think in a couple of years, I'm kind of optimistic. We'll see that kind of a deal come.

SELIGSON: Yes, I tend to agree with you. I mean, the one thing I would mention and (UNINTEL PHRASE). I happen to have a communication from the chairman of one of the commissions regulating Art's operating companies after I had sent that person an e-mail with an article (UNINTEL PHRASE). And that person, that chairperson, suggested in the e-mail that was sent back to me that (UNINTEL PHRASE) even stronger state control over power plants and over transmission (UNINTEL) given up to anybody.

Because that way they could be sure what was (UNINTEL PHRASE) of the one who was responsible for reliability in (UNINTEL PHRASE). And I would (UNINTEL) to all of you in fact that you all, anyone who buys electricity who's in this room is paying at least 50 percent more than people who are living in New Orleans. Think about that. It's not because you're further away from New Orleans.

It's a lot of other reasons. But the price of electricity varies all over the country by a significant degree. And that makes it even more complicated. And one of the things the people in New

Orleans and in Atlanta and in the other (UNINTEL), cities in the United States in the Southeast think about is that they're going to lose this concept of these transmission organizations that's going to take away their inexpensive power and give it to somebody else who's paying a lot more now.

WIESE: That is really the bottom line is for the opposition in the Northwest and in the South. Their electricity costs there are cheaper and they don't want to lose that advantage. It's a competitive advantage that they think that they have enjoyed and built some time over a long period of time. And they're afraid that with a completely nationalized grid and a complete loss of the power (UNINTEL) grid by state regulators they will lose that.

And they will end up (UNINTEL) from their vantage point an unfair portion of the cost of fixing the grid. And let me give you an example of how this situation actually works now. If you're in Mississippi, say. Mississippi is a state that's attracted a great deal of (UNINTEL) power generation in recent years. A lot of new plants have opened. Built in hopes of (UNINTEL PHRASE) basically selling wholesale with often times no guarantee of where the supply is going to be bought from.

They are operating to some degree on the (UNINTEL) informed speculation about where they think the demand will be. And most plants in Mississippi were intended to have fairly ready markets in the Atlanta region which is growing extremely fast. And certainly Florida which is the fastest-growing large state in the country. But what's happened is it's been difficult to move that new generation out of the state on the transmission system because the merchant operators don't want to pay for the upgrades and changes to the transmission system that will give them access to it.

They basically want the rate payers in Mississippi to pay for it. But the rate payers in Mississippi aren't going to get the electricity that's being produced there. It's going to Georgia and to Florida and (UNINTEL PHRASE). It's really a question of who benefits and who pays? The most basic kind of economics, the most basic kind of politics.

MONIZ: I was just given a terrific, by the way, example of the eminent domain issue. Because he said the people in Mississippi didn't mind having power plants built. The power is to be sold in Georgia and Florida. But if you remember your geography, the people in Alabama would be very happy for the government to say, "We're going to build transmission lines for the people in Mississippi to sell power to people in Florida." (LAUGHTER)

(OFF-MIKE CONVERSATION)

SELIGSON: (UNINTEL PHRASE) well, two problems I think. Number one--

CROWLEY: We're almost out of time. So if we make this thought quick we want to make sure we get some questions squeezed in.

(OVERTALK)

SELIGSON: The chairman of FERC, Mr. (UNINTEL) and his number one other commissioner, Miss Brown (UNINTEL) have been very aggravating to a lot of people on a personal basis in the way they've proposed these things and what they've said. And whether a FERC proposal is rewritten (UNINTEL PHRASE) et cetera, et cetera.

The other point I want to make is that the whole concept of somebody controlling your assets (UNINTEL) either a dividend check at the end of the year or a bill because they had to do something on your behalf and prove your (UNINTEL) which you don't control is a (UNINTEL) to any investor. In other words, why would I put money into a company where the management does not make the decisions about their assets? Some other organization which is not the problem makes those decisions.

CROWLEY: Great. Thanks. Well, we'll take a few minutes of questions if anyone here has one. Show your hand. Over there.

QUESTION: I think (UNINTEL PHRASE). All different states. That some states haven't deregulated at all and other states have different approaches to how they go about the local (UNINTEL PHRASE) you mentioned about that Texas has their own grid. And I wonder if it has been shown that states that didn't deregulate have had certain benefits and (UNINTEL) and states with different approaches have had less reliable systems? Or has been shown that just across the board variation.

MALE VOICE: Well, the regulation, it works so differently in different places. I think the argument (UNINTEL PHRASE) Pennsylvania, for instance, (UNINTEL PHRASE). That (UNINTEL) experience in California has frightened some states away from deregulating (UNINTEL). Results (UNINTEL PHRASE) system operator (UNINTEL PHRASE) is that he has played that (UNINTEL PHRASE) and others (UNINTEL PHRASE) counselor and an arguer and a cajoler than he really (UNINTEL PHRASE).

(OFF-MIKE CONVERSATION)

MALE VOICE: I thought you said the original question (UNINTEL) reliability.

MALE VOICE: Yes.

MALE VOICE: And I wouldn't say there's no difference. The system is basically (UNINTEL) you're probably too young to remember (UNINTEL). I'd have to say in (UNINTEL PHRASE). The system is very good although it doesn't matter (UNINTEL PHRASE). The Southeast, by and large, have not done anything. North Carolina, South Carolina, Florida, Georgia, Alabama have not done anything towards deregulation. They have low rates and everything works.

Pennsylvania, New Jersey and Maryland has one of the oldest of these regional organizations. And they have all moved towards some form of restructuring (UNINTEL) rather than deregulation. Restructuring. And they've basically been reliable. And that's the (UNINTEL) organization. New England has been up and down in my judgment on that.

(OFF-MIKE CONVERSATION)

MALE VOICE:--question of reliability is a matter of perspective. If you look at it from the standpoint of the more than a quarter of a century has passed since there was the last big blackout in New York City one would have to say that proportionally this is a tiny little (UNINTEL) in a great huge calendar of success. However, it doesn't make much sense to try to tell that to anybody who's stuck on the sidewalk or had to climb 50 stories up a hot, black apartment--

(OFF-MIKE CONVERSATION)

MALE VOICE: Okay. Quickly, we have another question.

MALE VOICE: Given all these snide remarks about restructuring versus deregulation, I say, of course, (UNINTEL) deregulation I mean really is ridiculous. Some of these things your thinking about are, for example, fixed retail price caps. That's hardly deregulating.

But I'll just toss it out here because time's limited. We can come back to this perhaps. There's also been a confusion here because we did not sharply distinguish between wholesale and retail level, okay? I mean, it's quite different. A lot of the things that you are, California which you hear a lot about is really a retail deregulation issue.

Although, it was not deregulation in any sense. It wasn't even a restructuring plan. We can get back to this. California had a stranded asset plan which is a very different issue. And that's why it failed.

So anyway what I would say, and come back to this again, is that I would suggest we keep our focus for now away from the retail (UNINTEL) deregulation and really focus on getting the wholesale and large scale wholesale markets functioning. Able to handle transactions that use our generation assets appropriately. And we do not have that system. It's hard enough to get that system right without worrying about the merits of retail.

(OFF-MIKE CONVERSATION)

MALE VOICE: Okay, I'm surprised that we haven't spoken of the consumption side of it either through, and I believe this administration has emasculated the process of increasing the stringency of consumption standards for appliances. But that's also using sophisticated pricing, varying prices hourly or with the season. I mean, if it's a very slow process adjusting the physical infrastructure we could slow consumption growth, shift the patent consumption.

Perhaps even impose a federal excise tax on electric power consumption or something. In other words, if this is really urgent we have to act quickly. And the price system is a wonderful tool which will also help innovation in the consumption area I would think.

MALE VOICE: Of course, I would point out again (UNINTEL) to the experts that consumption is something I think folks on Capitol Hill do not want to talk about. It's their last resort. But

maybe you all can shed some light on that. They don't like to tell people that they can't do anything.

MALE VOICE: Well, I think on the demand side there are some existing incentives already for demand side for higher efficiency. I'm not surprised. I mean, I'm not trying to be partisan here. But I do feel that certainly the emphasis on efficiency is not what it should be in the last couple years across the board.

I think one thing you said is absolutely correct. That if one wants to address the kind of problems that we're discussing, actually the fastest response can be on the efficiency and conservation side. There are also intermediate term responses that can do that. Boy, this is going to be a long discussion.

But, for example, one of the things that we mentioned briefly, David mentioned it and I mentioned it. Some of these opportunities for (UNINTEL) energy are opportunities for enormous efficiency. Combine heat and power where you can get 80, 85 percent system efficiency literally in many parts of the country. It's gotten a little bit better but it's still awfully, you get tremendous barriers put in your way by local distribution utilities if you are trying to do that.

Time of day metering, kind of things you talked about. Well, actually, today for quite some time there's a fair amount of that done, of course, already with larger customers. People who negotiate directly with suppliers or distribution companies will have a variety of rates, interruptible rates, et cetera. But one question is do you push this ultimately? How far do you push this down, let's say, to the individual consumer at home?

One of my arguments is before you get to the extremely sophisticated, so-called information power portal that's managing all of your appliances in regards to what's happening in the grid, long before that, you can just have kind of time of day rates. You know? Using historical peak times.

MALE VOICE: Yes, but you're not using a historical meter. Which means that your local utility has to come in--

MALE VOICE: No, but I'm saying--

(OVERTALK)

MALE VOICE: There's that. However, this kind of incremental application is very low cost in contrast to the much more sophisticated stuff. So I'm saying I think there's a lot of low hanging fruit that if we got some rules of the road together we could begin to harvest.

MALE VOICE: However, I would point out that during the period of the Clinton Administration that we had wonderful job growth, great economy that electricity consumption increased by something around (UNINTEL). So we are not talking to that a big deal about reducing consumption.

MALE VOICE: Excuse me. (LAUGHTER) The relevant metric, it was just (UNINTEL). But I mean, it depends on the metric you want. There is the metric of energy used per unit of GPE. And that has been historically going down between one and 1 1/2 percent per year. There was a more dramatic drop from the mid-'70s to the mid-'80s. Some of the drivers of that drop, however, we may not want to replicate. (LAUGHTER) Okay?

MALE VOICE: David, were you going to add something? And then we squeeze in a question or two?

MONIZ: Yes, there's two basic areas to getting a lot of energy efficiency programs into place. One is that the structure of (UNINTEL) for utility (UNINTEL PHRASE) they get a return on that capital. So they have to be including some kind of physical capital place to realize that isn't going to matter. And the efficiency in the (UNINTEL) part as we indicated was twice response. So there's no capital that (NOISE) alternative. So that's one disincentive.

The other kind of disincentive is that probably (UNINTEL) have what they call what a rebound effect. Today prices may be high so you may take action to reduce it. But tomorrow or next week, all of a sudden prices fall down, you may go back to your old habits again in terms of consumption of electricity. You may do it more efficiently because you have more better appliances and stuff, but your actual load requirement on your house would manage to go up.

SOUTH: That in fact has happened in California during the spike of electricity crisis there during deregulation, or whatever we'll call it. But not--

(OVERTALK)

SOUTH: There was a lot of voluntary conservation because electricity was extremely expensive and in short supply. I should have said short supply rather than extremely expensive. However, as soon as that period passed, people went back to their old habits. I don't think that there's been any really lasting conservation that's been shown from that experience.

WEISE: One note again. The retail prices were capped, so they did not go up. That was really a public education effort that had a short term impact.

MONIZ: Let me interrupt. I'm sorry, let's just get one or maybe two last quick questions in if we have them. Okay, there's one.

QUESTION: At times, it appears as if there's a conflict between smart politics and intelligent energy policy. And I'm not going to ask you to answer that question, how you overcome that conflict. But I am going to ask you, and Carl this is directed to you, many of the states that restructured in fact imposed as you mentioned a few seconds ago rate caps, price freezes. And they did it on the delivery portion of the utilities system.

They let, for the most part, the generation float freely. And the very thing that people are saying today is in need of repair has been operating under this artificial cap for five to seven years. And there is absolutely no sign of the politics allowing caps to be lifted in the states that have imposed it.

SELIGSON: Clearly it's something of worry to (UNINTEL). And not just states which have restructured. In other states where companies have agreed to rate caps or rate freezes (UNINTEL) been a time when their own internal frequencies run out. And they're going to have to beat back. Companies are now going before their commission asking them for rate increases that haven't been there for five and ten years. It's a big problem, there's no question about that. You have to be very careful as an investor as to where you go. I don't know what the question is, but that's the answer.

WEISE: If good energy policy equals smart talk, you would have a much higher gasoline tax today than we do. You would have higher fuel centers (UNINTEL). You would have people eager encouraging involvement in more than the inner tower. You would have a lot more aggressive search for domestic natural gas, including drilling off-shore. There are all kinds of decisions we would be making as a society if these were easy political decisions.

QUESTION: Well, this is maybe an extension on this exact point. We all seem to be dancing around it, although Art took a little bit of a stab at it. Isn't this the problems that exist today? There seem to be lots of different ideas and theoretically valuable solutions. But at the end of the day, there's no centralizing impetus behind it. Isn't the problem fundamentally a lack of leadership and political will on the part of the executive branch first, the legislative branch second in Washington, and then perhaps at the state level that's keeping us all in a frozen state of animation that's ten years old?

WIESE: Well, it's 30 years this year since the first gasoline lines in the United States formed after the Arab oil embargo. And a lot of discussion in that decade and following about how important it was for us to reduce our foreign oil dependence. For political reasons, for economic reasons, for all kinds of reasons.

And the portion of our oil supply comes from foreign sources in the middle east keeps growing. We've had Republican administrations and Democratic administrations, Republican Congresses and Democratic Congresses. But not too much fundamental change.

MONIZ: The question just raised on the oil, I would phrase it a little bit differently. Well, for one thing after the oil embargo period, we did in fact have change. A lot of people started using smaller cars for quite a while, till recently at least. We did have cafe standards, which in fact have raised the fleet average substantially, in sync with technology. We have fallen off the wagon in the last 15 years on that.

But another issue, I'll just go beyond what Art said. To be perfectly honest, the discussions of oil security are often I would say rather simple. In fact, statements about dependence on foreign oil, the first approximation mean nothing. Dependence on oil is an issue because it's a world commodity market. And the fact that people don't realize is that if we somehow manage-- let's go through a little thought experiment where we suddenly have a big efficiency gain. We all decide to stop driving three days a week, for whatever reason, enjoy our families. Oil consumption goes down, this happens all over the world. Does that reduce our dependence on mideast oil? Hell no, because they have the cheapest barrels. They're the only ones who will make money at that price.

When oil was $10 a barrel back in 1999, who went out of business? The independent oil producers in the United States. It's a much more complicated situation. The real issue oil, and that's a whole other story. Oil, alternative fuels, how do we want to drive, how do we want to do mobility.

With regard to the electricity sector, as I think it was Carl said earlier, today on a macro level in the United States we are not short of power plants. The recession has taken care of that over the last couple of years. Not just the recession, but it's had an impact certainly in terms of slowed growth. We all hope that's going to be changing. And we have to start facing the fact about what we're going to do for capacity.

Certainly I think five years from now, we have a real issue. I mean, if you were to think about timeframes, that's about right. General terms. There are so many interlocked decisions to be made where it's political will but it's also bringing the arguments a place where the public can understand them. Because as we heard earlier, the example of Mississippi and the source supply and demand. Well, that was really a stupid decision, to build power plants in Mississippi unless you believed you had a system approach that was also going to take care of the transportation system. And we didn't.

So we have all funny pockets around the country where we can't move juice through, where we have overcapacity, where have under-capacity. It's just a completely unbalanced system. Frankly, it's no surprise from the other comments, I believe that in the end we've got to have some appropriate level of federal rules of the road that guide how this thing develops. The country is by observation apparently not ready for that.

SELIGSON: You were talking about oil compensating. Relative to electricity, we're far more concerned with cloister coal dependency. Fifty percent of the electricity in the United States is generated by burning coal. Coal is a pollutant. Burning coal is a pollutant. Burning coal will

continue to be a pollutant despite all of the things, even with oil regulations that even Senator Jeffords might propose, it will be a problem. And it will be more of a problem as we go on.

So we have to look for an additional fuel source. Ernie mentioned originally when he was talking about his study what could be done as a different thing. Oil is a non-issue as far as generating electricity is concerned. So we're talking about coal, natural gas and nuclear as being the three fuels that are used to generate electricity. We've got to move this nuclear thing.

Ernie gave you some parameters. Small plants start out-- we did this a number of years ago, work by (NOISE) and Jove (PH) and NAI, co-sponsor of this meeting, working like hell to create things with the Nuclear Regulatory Commission. So that you got away from a lot of the things that would cause the plant to take ten years to build originally. Pre-advanced signing, standard design, et cetera, et cetera. It's time to get on with it and get a new plant built.

SOUTH: I think it was indicated that we haven't built a new nuclear plant in some time, we actually have (UNINTEL) capacity. In the last five years alone we've added 13 equivalent 1,000 megawatt plants simply to upgrade improvements in the performance of the plants. So you have had additional new capacity coming on line that's been added to the generation (UNINTEL) load increases. And it's done on existing plants without any new issues.

The other thing that we're doing is avoiding plut (SIC) loadings going into various locales where they're situated. So we've avoiding (COUGH) emissions, nitrogen oxide emissions, carbon emissions, and whatever other kinds of air emissions you are concerned about. It's been avoiding that as a result of more nuclear not another fossil committed source.

The regulations that are proposed in Harrison (PH) now, I mentioned a conflict between the Energy Bill and the various clean air bills. While those are very real, it doesn't really matter which clean air bill is passed because the Environmental Protection Agency already still has in place another regulation. They're going to tighten requirements on fossil fuel plants going forward. It's just a matter of how fast and how much you're going to reduce those pollutants.

The bills that are in Congress right now do it faster and to a greater degree. But the EPA right now has rules in place to knock down these emissions and basically force a switch to move away from fossil fuels. Again, we have an option as I indicated, a unique u-turn in demand with a non-emitting power source, nuclear power. It gives us a tremendous amount of additional capacity that can be added at existing plants. It's emission free.

It's important also that this society live for one technology and a loss for another (SIC). By avoiding these emissions through not any source but nuclear power, it's actually benefiting old power plants because they can avoid the expenses of adding this control (UNINTEL). They will continue to operate. They still have to perform meeting requirements, but they may not incur additional cost because that power is now being served by a non-emitting source. So there's a win-win situation there.

And so it's important when we're looking at these various problems, we're looking at the (UNINTEL), we're considering all the factors involved. And the one which was brought up in

location, most of these nuclear power plants can add capacity. They're located in critical areas in the grid where power is needed. It's one of the reason why there's adversity about it wherever they're located because they are located near population centers. But in fact being in close proximity means that they can deliver power in local areas without necessarily transmitting long distances.

The bottom line is there are a lot of things to consider. Environment is definitely an element here. If it's going forward, it's going to impose stricter standards. And we have a power source we can turn to that's reliable and can meet those objectives.

Because of the blackout, we have focused, and I have focused also on the issue of delivering energy. It needs to be looked at in the relatively short term. What I would emphasize is I believe the technologies for doing that at a reasonable cost are available, we have them. It's a political issue to be resolved, as we discussed.

MONIZ: However, let me just finish by talking about the very long term where the solutions are less clear. Maybe it will be depressing, however I will just give you a couple numbers.

If you look at the carbon dioxide emission problem, global change, today the world uses about 400 quadrillion BTUs, quads, I forget what it means. Four hundred, total world energy use. All but 60 of that are fossil fuels. By mid-century, the world will be at more than 1,000. We hope so, because if not we're going to have a lot of political problems in a lot of parts of the world. Those countries need energy to grow, the developing world.

However, we probably cannot increase our fossil fuel use and meet the climate change problem. So the non-fossil energy sources have got to grow from like 60 to 600. That's the big challenge. There's been a lot of encouragement for Joe here, but there's no silver bullet. Efficiency, nuclear, renewables, and coal us but capturing the carbon and disposing of it. No silver bullet. We probably need some significant contribution from all of them if we have any hope of meeting the energy and economic aspirations of the third world on a 50-year time scale, and doing so without screwing up the climate change problem.

CROWLEY: I'm not sure we came up with all the answers, but it's a great start. Please stay for concluding remarks from Joe. But if you all are interested in our transcript, it will online September 15th at, is it the NEI website? And it will also be running in the New Republic, the issue on sale September 19th. So thank you all for coming and just some very quick conclusive remarks.

JOE COLVIN: Thank you Michael. I just wanted to say thank you not only to the panel, but thanks to the audience. Interestingly we covered a broad range of a very difficult and complex subject, I thought very eloquently by the panel. We did have some discussion and debate about whether it's deregulation or re-regulation or restructuring. No one mentioned liberalization.

I was kind of amazed it did take the audience to raise the issue of demand-side management, consumption side. And also the question of whether we really have the political will, or whether

intelligent congressional decisions is an oxymoron. Nobody mentioned hydrogen and the hydrogen economy moving forward. Perhaps we'll save that for another day.

I was most intrigued by our discussion of the honorable Bill Richardson, governor of the great state of New Mexico where I happened to graduate from the University at. And we had a discussion about his statements but nobody mentioned that he had been the secretary of energy, which I thought was particularly intriguing. So hey, thank you very much for your attention. We really do appreciate your thoughtful participation here. We again thank you very much for joining us this evening. Have a great evening. Goodnight.
(APPLAUSE) Ernie could you state out the website address for the report for everybody?

MONIZ: It's web.mit.edu/nuclearpower as one word, slash at the end.

(OFF-MIC CONVERSATION)

**END OF TRANSCRIPT**