

Statement before the
Blue Ribbon Commission on America's Nuclear Future
Of
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Michigan Public Service Commission
On behalf of
The National Association of Regulatory Utility Commissioners



May 25, 2010
Washington, D.C.

NARUC Preferences for Nuclear Waste Management and Disposal

Background

The National Association of Regulatory Utility Commissioners (NARUC) supports the policy in the Nuclear Waste Policy Act of 1982 setting forth:

- The federal government is responsible for disposal of high-level radioactive waste including spent (used) nuclear fuel from commercial reactors
- The owners of spent nuclear fuel, and their ratepayers, shall pay (and have paid) for the share of disposal costs for their material.
- Disposal shall be in a geologic repository licensed by the Nuclear Regulatory Commission with radiation standards from the Environmental Protection Agency

We had an expectation from the NWPA that the Department of Energy (DOE) would begin initial waste acceptance and disposal in the properly licensed and constructed repository by January 31, 1998 as the law and contracts signed with owners of spent fuel required. Those expectations began to fade as the project encountered one difficulty after another. The date was revised to 2010, but that proved elusive as well. The last official schedule forecast possible opening in 2017, subject to several conditions including adequate appropriations and prevailing over further legal challenges.

NARUC had no preference for Yucca Mountain when Congress amended the NWPA in 1987 to study that site alone for suitability as a repository. We supported the congressional resolution in 2002 to override the veto of the Governor of Nevada of the site suitability decision. We took that position with the understanding that once approved by Congress, the repository would still be required to meet the Nuclear Regulatory Commission and Environmental Protection Agency regulatory requirements in an extensive NRC license review proceeding that was expected to take three or four years.

NARUC and the State public utilities commissions it serves are stakeholders on the disposition of used nuclear fuel from commercial reactors because the fees paid to the Nuclear Waste Fund by the owners of the used fuel are passed on the ratepayers who are supplied with electricity from nuclear power generation¹.

Changes at Yucca Mountain

We are not here to argue whether the decision by President Obama that Yucca Mountain is “not on the table” and that the Secretary of Energy has determined that building a repository there is “not a workable option.” We do observe that when the Director of the Office of Civilian Radioactive Waste Management (OCRWM) within the Department of Energy (DOE) submitted the Yucca Mountain repository license application in June 2008

¹ A table of cumulative Nuclear Waste Fund payments by States is attached

it was a major document. This 8,000 page document was the culmination of over 25 years of exhaustive investigation of the site and calculations of the forecast of radiation risk that the facility would meet, first for a period of 10,000 years then later revised by EPA revised standard to an unimaginable period of one million years. We expected the staff of the NRC, aided by expert consultants to conduct a rigorous review, and that an open adjudicatory process would be subject to contentions by those who challenged the proposal.

In early 2009, the Obama Administration announced its intent to terminate the Yucca Mountain project and to create a blue ribbon panel to make recommendations on an alternative disposal strategy, but the FY 2010 DOE budget contained funding to support the continuation of the license review.

When the FY 2011 DOE budget was released a year later, it took a different approach:

1. The license application would be withdrawn with prejudice from further consideration.
2. No funding for Yucca Mountain would be included in the FY 2011 budget.
3. The Blue Ribbon Commission on America's Nuclear Future was formed.
4. The OCRWM organization would be dissolved and residual functions would be split between two other DOE offices beginning in FY 2011.

On March 3, 2010 the Department of Energy filed a motion with the NRC's Atomic Safety and Licensing Board to withdraw the license application with prejudice. Our organization and several others filed a petition to intervene for the purpose to oppose the withdrawal, asserting that the withdrawal gave little rational explanation or record-based findings to justify it. Concurrently, several lawsuits were filed before the U. S. Court of Appeals challenging whether DOE had the authority to terminate the Yucca Mountain repository.

Those questions will be addressed before the respective bodies. We will express our preferences to the Commission as though a repository at Yucca Mountain is unlikely but still possible in the future and the Commission has been tasked with coming up with a recommended strategy "to meet the government's obligation to dispose of our Nation's used nuclear material," as the President's January 29, 2010 Memorandum stated.

NARUC Preferences

1. Since 1998 when DOE failed to meet its statutory and contractual obligation to begin waste acceptance for disposal, we have simply asked that the government fulfill its part of the NWPA disposal bargain and remove the spent fuel per the Standard Contract since the utilities and ratepayers continue to pay for services not performed. That remains our position as we believe that the license application shows that Yucca Mountain will meet the requirements of NWPA and regulations.

2. If Yucca Mountain cannot be licensed or is licensed but not built, we interpret NWPA as still requiring DOE to develop and dispose of spent nuclear fuel in a geologic repository. Therefore, unless the law is repealed or amended to direct otherwise, Congress should authorize DOE to conduct a site search for another suitable repository site. This requirement to amend the NWPA in order to pursue an alternate site was confirmed in a Congressional Research Service report². We understand Secretary Chu's statement before the Commission is that you are not a siting board, but we believe you can and should review site selection criteria and whether different incentives might make siting less contentious.
3. It may be difficult to re-open the question of applicability of the radiation standards set after many years and several lawsuits, but we suggest that some review process be conducted or recommended. Those who lack knowledge of radiation health find difficulty conceiving the radiation standards (40 CFR Part 197) that extend to a million years. The 1995 report of the National Research Council recommended a risk-based regulation, but the Environmental Protection Agency issued a dose-based standard.
4. We would hope that the Yucca Mountain experience and more positive results in other countries have lessons learned that make development of a repository more successful on a second try. We believe the roles of government and the nuclear industry should be reconsidered for the next try and the way in which the Nuclear Waste Fund is managed definitely needs reform. We will be glad to explain why.
5. Recognizing that "starting over" to develop a repository will take years, possibly decades, there remain several critical matters to address immediately:
 - a. There are nine sites where ten reactors have been permanently shut down, yet the sites cannot be fully returned to other productive uses since spent fuel is still stored there. In 2007 Congress asked DOE to come up with a plan to move that fuel to a central interim storage facility DOE would build and manage. Congress should direct DOE to implement such a plan or make arrangements with the private sector to provide this storage. We solicit the Blue-Ribbon Commission's support for this for immediate implementation. We would even request an early signal from the Commission that it sees no conflict with any of the foreseeable disposal or reprocessing strategies it may recommend and the development of a modest sized consolidated interim storage facility.
 - b. Federal courts have already ruled that the federal government is liable for the added storage costs past the dates agreed in contracts with spent fuel owners (termed as "purchasers" in contract parlance.) This is particularly costly in most locations where the cooling pool storage at the reactor sites

² The Yucca Mountain Litigation: Breach of Contract Under the Nuclear Waste Policy Act of 1982. Congressional Research Service, December 2009.

has long since been filled to capacity and the older fuel removed and placed in concrete and steel containers called dry casks that are stored outside or in vaults. Damage awards and, in some cases, settlement agreements have been reached. In 2009—when DOE had a plan to begin waste acceptance and disposal at Yucca Mountain by 2017—DOE officials estimated that the liability for 65 cases could reach \$12.3 billion. That estimate can only grow as long as the government does not take title to the fuel. Something needs to be done to limit the liability.

- c. Not in all locations where spent fuel is stored – 72 operating and shutdown reactor sites in 34 States—and certainly not constantly, but periodically some neighboring community or individual or organization opposed to nuclear power will raise questions or even voice fears over safety and security of these storage facilities. Even President Obama in 2007 referred to a need for “improving the safety and security of spent fuel at plant sites” until a safe, long-term solution can be implemented. Although the owners and the NRC contend the storage is safe and secure, this factor was included in the site recommendation by Energy Secretary Abraham in 2002, as the country became more concerned about terrorism threats in the wake of the 9/11 attacks. While we are not alarmed or even concerned about these risks, the important point is that some of the public can be stirred to fearing risks that they perceive.
6. During the Yucca Mountain site decision debate, suggestions were made by those who either opposed the site or who expressed fears over perceived risk of transporting spent fuel from present location that the spent fuel should remain where it is. Most never said how long that might be, but a few were more thoughtful by adding, “...until technology provides a better solution.” That “leave it where it is” disposition was precisely what the findings of the NWPA over 27 years ago declared to be inadequate. Leaving spent fuel at reactor sites was not the basis for utilities and ratepayers to provide close to \$30 billion to the Nuclear Waste Fund since 1983. And that is not what President Jimmy Carter had in mind when he said in 1980, “Resolving civilian waste management problems shall not be deferred to future generations.”
7. It may seem unnecessary or beyond the scope of the Commission, but we believe attention should be focused by the commission on the gap between the excellent (unblemished) safety record in transportation of all forms of radioactive waste over the past 40 years yet many people have a perception that transportation of this material poses great risk. It is time to be plain in understanding that Yucca Mountain opponents sought to exploit that sense of danger to serve their purpose. The Senator Majority Leader said, “It would be dangerous and irresponsible to ship the most dangerous substance known to man through cities and small towns, and past schools, hospitals and businesses so it could be buried 90 miles outside

of Las Vegas.³” How will any of the possible alternatives the Commission may recommend be feasible if the senator’s belief extends to other locations? The mass media seems to add to the sense of dread of shipments of almost any type of radioactive material. Journalists are rarely familiar with such objective analyses of transport risk as found in the *Going the Distance?* report of the National Research Council⁴.

8. We expect the Commission will be interested in reprocessing spent nuclear fuel or “recycling” as many find it more appealing to refer to the means of extracting more of the energy value of the partially used fuel. There will be questions and discussions over economics, technologic advances, and potential for proliferation. NARUC has supported continued research into reprocessing and shares the view that if there will be substantial global nuclear power expansion there will probably come a time when uranium becomes more scarce and expensive and closing the fuel cycle will become necessary. No one can say now when that may occur. We do believe this:

Even if we reprocess spent nuclear fuel **a geologic repository is still needed** for (a) the defense-related high-level radioactive waste that has already been reprocessed or cannot be reprocessed and (b) the residue from reprocessing that still requires isolation, perhaps less of it but still for hundreds or thousands of years.

Moreover, it should not be unexpected that while many people may find the idea of recycling attractive there is still likely to be opposition to siting such a facility as well as transporting spent fuel to it. We have seen analogies with advocates of wind energy being opposed when it is sited near them. Nonetheless, it was encouraging that in the GNEP initiative DOE solicited expressions of interest in hosting recycling facilities in 2007 and eleven commercial and public entities responded with some potential interest.

9. The International Atomic Energy Agency⁵ in a position paper of international experts in 2003 had some relevant points to consider:

“Perpetual storage of radioactive waste is not a sustainable practice and offers no solution for the future.”

“The argument that action should be postponed until a scientifically better solution is developed is not convincing. After decades of research on the disposal of nuclear wastes, geologic disposal is the only approach that has gained widespread credibility in the scientific community and

³ “Reid, Ensign Introduce Legislation to Fight Proposed Yucca Mountain Dump,” Press release, Senator Harry Reid, March 6, 2007

⁴ *Going the Distance? The Safe Transport of Spent Nuclear Fuel and High-Level Radioactive Waste in the United States*, National Research Council, 2006

⁵ *The Long Term Storage of Radioactive Waste: Safety and Sustainability*, 2003, IAEA

therefore it is highly unlikely that some completely new idea will be forthcoming.”

10. Finally, the commission should consider these statements from the National Research Council⁶ of the National Academies of Science:

“Geological disposal remains the only long-term solution available.”

“Our present civilization designs, builds, and lives with technological facilities of much greater complexity and higher hazard potential.

“Today the biggest challenges to waste disposition are societal.”

The National Research Council report did consider monitored storage on or near the earth’s surface to be a feasible option, however “the major uncertainty is in the confidence that future societies will continue to monitor and maintain such facilities.” In the Environmental Impact Statement for Yucca Mountain, the EIS analyzed environmental impacts for two “no-action” alternatives:

1. Continue storage at 72 commercial and 5 government sites under regulatory compliance for 10,000 years, which included replacement of dry cask storage containers every 100 years.
2. Continue storage at those sites, but after 100 years no effective institutional controls are assumed and storage facilities would begin to deteriorate leading to radiological contamination.

The first scenario would be far more expensive than the repository. The second would be irresponsible with unacceptable harm to humans and the environment.

If a seemingly attractive site such as Yucca Mountain –often referred to as “the most studied piece of real estate on Earth”—cannot be developed for a repository, **does that mean it will be as difficult or even more difficult in another site in another State?** Will the well known battle against Yucca by the State of Nevada be a blueprint for other State leaders to follow, should the “threat” shift in their direction? For a candid account of some of the political moves and countermoves in 1987 and more recently, see the sidebar in a 2009 *Scientific American* article by *New York Times* reporter, Mathew L. Wald⁷.

With the Nevada “experiment” looking like a failure, we should learn some lessons on why it failed. We can observe that the project was pursued under the leadership of five Presidents and eight Secretaries of Energy with various degrees of commitment to the goal. There were lawsuits and other actions taken to impede the evaluation process. Site investigation and pre-licensing activities have consumed more than \$7 billion.

⁶ *Disposition of High-Level Waste and Spent Nuclear Fuel*, 2001, National Research Council

⁷ “What Now for Nuclear Waste?”, Mathew L. Wald, *Scientific American*, August, 2009

Are there lessons to be learned from other countries facing a similar challenge? With smaller quantities of waste, different geography to consider and different institutional and social conditions, many other countries are encountering difficulty even though there seems to be consensus among international technical experts that geologic repository disposal is the preferred alternative. There are two notable exceptions where positive signs of progress are visible. Both Sweden and Finland have considered alternatives, chose geologic disposal, had public dialogue, conducted a site search and gained both national and local concurrence for sites that were chosen in each country. In fact, many consider the key to success was assuring the local communities considered for the repository that it would only be approved for development if the community agreed. It has been our observation that Nye County, in which the Yucca repository site is located, is supportive of the repository, yet it is the more distant and much more populated Las Vegas and the State political leadership who fought the project most vigorously.

Having to gain the support of a community or State before the project site would be selected changes the whole dynamics of the relationship between the federal government (or a hybrid organization on behalf of the government) and the region. Although the magnitude of the financial incentives (benefits) authorized in Subtitle F of NWRPA, that could have been provided to the State of Nevada, are not large in today's dollars, the State was adamant from the outset that it would never accept such benefits because they were convinced the facility posed unacceptable risks to the public.

Could a site search be conducted not just for technical suitability but with assurances that State and local approval would be respected and with more generous financial and other incentives? A recent report by several professors of nuclear engineering described some ideas from a 2008 workshop on how a "post-Yucca" solution to spent fuel management might be pursued.⁸ In the report, the participants propose a more market-based approach to various storage, recycling and disposal alternatives including setting up a new "permanent fund" similar to that for Alaskan oil, which has been rewarding in that State.

The Canadians have had some difficulties and delays with their disposal program have now shifted to a site search modeled along the lines of the Finland and Sweden approach. They have two other differences, and seeming advantage over their southern neighbors:

- They have a well-managed interim storage program in place. This means there is no particular time pressure to get their repository in operation.
- The Nuclear Waste Management Organization, responsible for the repository program, is created from and managed by the nuclear reactor owners. The NWMO determines the repository program costs, sets fee levels, collects and invests the fee and budgets for program expenses.

The Canadian government is involved in regulatory requirements and ensuring public participation in the repository program but relies more heavily on the nuclear industry

⁸ "Plan D for Spent Nuclear Fuel" University of Illinois at Urbana-Champaign, 2009

than we do in the United States. There are some commonalities on repository design among the Sweden, Finland and Canadian programs.

Financing the Disposal Program

The Nuclear Waste Policy Act authorized a well-designed financing scheme for the repository program. It created the Nuclear Waste Fund (Section 302) and it even had provisions for a separate Interim Storage Fund (Section 136) for a limited scope, limited duration program that has since expired. There was direction for allocating repository costs between the Nuclear Waste Fund (NWF) for commercial waste and the Defense disposal fund for government high-level radioactive waste, largely from weapons programs and nuclear propulsion systems on Navy ships and submarines.

The NWPA set the NWF fee at one mil (tenth of one cent) per kilowatt-hour of nuclear-generated electricity sold. To our knowledge the fee was not precisely calculated based on disposal costs anticipated, but the Secretary of Energy is charged with the requirement to annually review the adequacy of the fee. There are provisions to borrow to meet cash flow requirements and for the Secretary of Treasury to invest any surplus funds in the balance in securities and for the Fund to be credited with investment returns (interest.) The history of the Fund shows a steady and slightly growing revenue stream, as nuclear productivity improved in recent years, compared with a fractional appropriation rate. With the accumulating balance, there has never been a proposal for a fee increase.

Some people are puzzled when they look at the reports on the status of the Fund and ask why the repository program has had a history of budget restrictions?

The answers lie in a fog of fiscal, political and communications problems:

1. There is no correlation between NWF fee revenue and repository program appropriations. Appropriations come from the Fund, but appropriations have never approached the level of fee revenue.
2. The Fund is often referred to mistakenly as a “trust fund,” although it was intended to operate as such a fund though it is not designated as such.
3. Federal fiscal reform legislation enacted subsequent to NWPA applied to the Fund has left the appropriations levels limited more by discretionary spending caps set for DOE than by fee revenue.
4. The NWF “balance” reported by DOE currently at over \$24 billion is largely an illusion. It is more accurate to consider the balance to be the sum total of the money from fees that came into the Treasury and *spent* on other government activities unrelated to nuclear waste and that this amount that was “borrowed” will be returned to the Fund by a future congress. DOE has a different understanding of this murky picture and has the securities document in a safe.

Maybe that is so, but the practical effect of all this is that money paid in fees by spent fuel owners for disposal services they contracted for is only made available for that purpose when Congress appropriates it.

5. The forecast for “investment returns” expected to be credited to the Fund in FY 2010 is over \$1.1 billion which is greater than the expected fee revenue of \$769 billion for the same period. In view of the of the uncertainty over a new disposal strategy as the Commission and the Administration consider alternatives that will have to gain congressional and public acceptance, in July 2009, the Nuclear Energy Institute proposed to the Secretary of Energy that the fees be suspended inasmuch as the expected interest will more than sufficiently cover the rather minimal program expenses. NARUC supports that request. The Obama Administration in its Statement of Administration Policy for the FY 2010 Energy and Water Development appropriations bill said “All of the fees collected in the Nuclear Waste Fund are essential to meet those obligations” referring to the obligation for managing and ultimately disposing of spent fuel. We find that difficult to accept since:

- The NWPA does not currently authorize the Fund to be used to *manage* spent nuclear fuel. That is the owners responsibility until DOE takes title for disposal. The law could be revised, of course, but there should be a presentation of the costs and benefits as well as open debate.
- Since the Administration has declared Yucca as “not an option” and there is no defined replacement disposal strategy, how can anyone know what it will cost?

When the FY 2011 DOE Budget requested no appropriations from the Nuclear Waste Fund, that led NARUC on April 2, 2010 to file a petition for judicial review before the U.S. Court of Appeals for the District of Columbia Circuit of the rejection of our 2009 proposal that fee payments be suspended until there was some sign that the recommendations of the Commission will be “actionable” and accepted by the Administration, Congress and the public.

Suffice it to say, the Nuclear Waste Fund is a mess and needs substantial reform if it is to be the primary source of financing a new disposal strategy. Various schemes have been advanced for use of the Fund to pay for such proposals as having DOE take title and manage spent nuclear fuel at present reactor storage sites (often without saying for how long) or to shift to a recycling program using the Fund to get started or to make up the unfavorable cost disadvantage of reprocessed fuel to fresh fuel. Such proponents may not realize the \$24 billion is not readily available.

We like the idea of shifting the fee structure to be a fee based on waste generated rather than based on electricity sold, so that market forces might provide incentives to reduce the amount of waste that is generated.

As our introductory letter to the Commission of March 25, 2010 stated, NARUC recommends the Commission form a Finance Committee to assess the present financing mechanism and see what improvements will provide a more reliable means of ensuring success over the long haul for whatever reprocessing or disposal strategy the Commission recommends.

How Should the New Disposal Program be Managed?

Some stakeholders of the civilian radioactive waste management program—including ourselves—have been critical of the management of the repository program over the years and some have questioned whether the Office of Civilian Radioactive Waste Management (OCRWM) within DOE is the best organization to manage the disposal program. It would be unfair to place all the blame for program delays on DOE as there were numerous attempts by opponents of the Yucca repository to defeat or at least delay it. While the proposed FY 2011 budget would eliminate OCRWM, without casting any negative suggestions on the caliber and dedication of the personnel in the Office of Nuclear Energy that is expected to take up implementation of the recommendations of the BRC, what leads us to think they will be any more successful than their OCRWM predecessors? We believe the Commission should review organizational as well as technical alternatives.

In Section 303 of NWPA, Congress asked that the Secretary of Energy in consultation with the Director of the Office of Management and Budget (OMB) and other federal agencies study alternative approaches to managing the disposal program, including establishing a private corporation, and report within a year. An advisory panel of volunteers was convened and reviewed both the financing and organization of the new program. It looked at OCRWM and nine alternatives. Just about all of the alternatives were considered better than OCRWM. The report preferred a hybrid “FEDCORP.”

In 2000, Congress asked DOE to review the prior study and in 2001 the Secretary of Energy submitted the Alternative Means of Financing and Managing the Civilian Radioactive Waste Management Program (AMFM) report. It concluded that reform of the financing of the program was “the highest priority issue in need of immediate action,” but recommended that no decision be made on alternative management approaches be made until the Yucca Mountain site approval which had not taken place at that time. We are unaware of any reaction by Congress, although the modest, in our view, legislative proposals in 2004 and 2005 to reform the Nuclear Waste Fund were not enacted.

We can agree there are attractive benefits that could be obtained by different organization, whether within the federal government, quasi-governmental or private sector, to implement a new disposal strategy that the Commission may recommend, but, it seems to us, there needs to assurance that the chosen strategy will be supported and sustained. With over 27 years invested in the repository program that was agreed to as *national policy* with the enactment of the NWPA to come to an end with:

- Abandonment of a site studied, declared suitable and not having completed review and determination of its safety by the independent, technically qualified agency designated in law to make that judgment, and
- Some ten billion dollars having been spent on the site evaluation and the illusion of another \$23 billion accumulated in the Nuclear Waste Fund, but in reality that represents what has been “borrowed” and spent on other things with re-payment in doubt.

On May 6, Senator George Voinovich introduced the United States Nuclear Fuel Management Corporation Establishment Act, S.3322 which would set up a federal corporation to assume the responsibilities now assigned to the Department of Energy, as well as new ones, to implement an integrated spent nuclear fuel management strategy. There are elements of the bill that are conceptually attractive and others that need to be improved. It calls for establishment of a Nuclear Fuel Management Corporation Fund with an Operating Account and a Capital Reserve Account into which the present Nuclear Waste Fund would be transferred, however the corpus of the Nuclear Waste Fund would be transferred to the Capital Reserve Account as an “unfunded asset” which will continue to accrue interest at rates and maturities determined by the Secretary of Treasury. The bill seems to remove the yoke of annual appropriations, spending caps and Section 302(b) appropriations allocations. We do not have an opinion on the bill as yet, but we recommend the Commission give it consideration.

That concludes my statement. We would be pleased to work with the Commission, its subcommittees or staff to address any of the topics we referred to. NARUC appreciates the members of the Commission taking on this assignment and that your charter is related not just to how best to store, possibly reprocess and eventually dispose of nuclear waste but also to assess how the failure to make genuine progress may impede achieving America’s nuclear future.

NUCLEAR WASTE FUND
RATEPAYER PAYMENTS BY STATE
THROUGH 3-31-10 (MILLIONS OF DOLLARS)

STATE	PAYMENTS 1 mill/kwh, One Time+Int	RETURN ON INVESTMENTS as of 9/30/09	TOTAL (PAY+RETURN)	DEBT*	FUND ASSETS** (TOTAL + DEBT)
AL	525.5	392.1	917.6	0.0	917.6
AR	350.1	261.2	611.3	175.5	786.8
AZ	259.7	193.8	453.5	0.0	453.5
CA	1,001.3	747.1	1,748.4	0.0	1,748.4
CO	0.2	0.1	0.3	0.0	0.3
CT	290.1	216.5	506.6	358.2	864.8
DE	45.6	34.0	79.6	0.0	79.6
FL	831.5	620.4	1,451.9	0.0	1,451.9
GA	670.7	500.4	1,171.1	0.0	1,171.1
IA	244.4	182.4	426.8	45.1	471.9
IL	1,834.8	1,369.0	3,203.8	971.9	4,175.7
IN	245.6	183.2	428.8	229.7	658.5
KS	130.4	97.3	227.7	0.0	227.7
KY	148.1	110.5	258.6	0.0	258.6
LA	316.0	235.8	551.8	0.0	551.8
MA	348.6	260.1	608.7	163.3	772.0
MD	384.1	286.6	670.7	0.0	670.7
ME	48.3	36.0	84.3	116.8	201.1
MI	305.9	228.2	534.1	198.0	732.1
MN	311.9	232.7	544.6	0.0	544.6
MO	246.2	183.7	429.9	5.1	435.0
MS	158.8	118.5	277.3	0.0	277.3
NC	1,508.6	1,125.6	2,634.2	0.0	2,634.2
ND	17.7	13.2	30.9	0.0	30.9
NE	186.5	139.2	325.7	0.0	325.7
NH	79.9	59.6	139.5	23.8	163.3
NJ	715.1	533.6	1,248.7	196.6	1,445.3
NM	75.5	56.3	131.8	0.0	131.8
NY	831.1	620.1	1,451.2	504.9	1,956.1
OH	452.2	337.4	789.6	32.6	822.2
OR	75.1	56.0	131.1	0.0	131.1
PA	1,348.1	1,005.9	2,354.0	66.5	2,420.5
RI	5.2	3.9	9.1	6.1	15.2
SC	675.5	504.0	1,179.5	0.0	1,179.5
SD	6.9	5.1	12.0	0.0	12.0
TN	562.0	419.3	981.3	0.0	981.3
TX	778.7	581.0	1,359.7	0.0	1,359.7
VA	686.1	511.9	1,198.0	0.0	1,198.0
VT	98.5	73.5	172.0	141.5	313.5
WA	166.4	124.2	290.6	0.0	290.6
WI	421.2	314.3	735.5	0.0	735.5
SUBTOTAL	17,388.1	12,973.7	30,361.8	3,235.6	33,597.4
FEDERAL	19.8	14.8	34.6	0.0	34.6
INDUSTRY	16.8	12.5	29.3	0.0	29.3
TOTAL	17,424.7	13,001.0	30,425.7	3,235.6	33,661.3

* Funds owed for fuel burned before 1983 but not yet paid by utilities (as allowed by DOE contract)

** before withdrawals for expenditures by DOE

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