

November 2001

## *Spare the Rods*

### *The Free-Market Alternative to the Yucca Mountain Repository*

by D. Dowd Muska

#### **Executive Summary**

**F**or two decades, the federal government has pursued a single plan for the nation's used nuclear fuel rods: permanent entombment in a geologic repository. Since 1987, the U.S. Department of Energy has studied a single site, Nevada's Yucca Mountain, for the location of that repository.

But the philosophy behind the Yucca Mountain program fails to grasp that used fuel from commercial reactors is not "waste," but a commodity to be bought and sold in the marketplace. There are many alternatives to burying it beneath Yucca Mountain. The United States could lift its ban on the recycling of spent fuel, and thus allow the material to be used again and again. Policymakers could also allow America's spent fuel rods to be sold to recycling facilities abroad. Transmutation, a process that reduces the radioactivity of nuclear materials, is another largely unexplored option. And with adequate funding, entirely new processes could be developed to make use of used nuclear fuel.

The financial mechanism to create

private-sector solutions to the spent-fuel problem already exists: the Nuclear Waste Fund. Customers of nuclear utilities have paid into this account for many years, and while much of the money has been wasted on the Yucca Mountain program, even more remains. If equitably disbursed to the entities now in possession of used nuclear fuel, the fund could cover the costs of alternatives. Auctioning off the federal government's commercial-reactor infrastructure—which the American taxpayer should never have had to pay for in the first place—would make even more funding available for new approaches to spent nuclear fuel.

Two decades of experience have shown that the federal government is completely incapable of solving the used-nuclear-fuel-problem. The Yucca Mountain program has been marked by politics, mismanagement, soaring costs and missed deadlines. It's time to harness the creativity and entrepreneurship of the private sector, and abandon the nation's failed and wasteful nuclear-repository program.

**The federal government has the power to end the Battle of Yucca Mountain almost immediately.**

*Technocracy is by nature hostile to diversity and freedom. Its goal is control—a uniform future shaped by experts. It recognizes only one best way. So it overrides the judgments and desires of individuals, curbing choice, experimentation, and learning in the name of “scientific” wisdom.*

—Virginia Postrel

By D. Dowd Muska

**T**he U.S. Department of Energy (DOE) is scheduled to soon issue its long-anticipated conclusion that a mountain in Southern Nevada is suitable for permanent storage of the nation’s highly radioactive waste. The department has studied Yucca Mountain, a nondescript mound located about 100 miles northwest of Las Vegas, for two decades. In that time scientists, engineers and technicians have devoted countless hours to verifying the site’s suitability for the entombment of the military’s high-level radioactive waste and the nuclear fuel rods left over from commercial and research reactors. And for almost as long as the DOE’s employees and contractors have studied Yucca Mountain, anti-nuclear activists at the local, state, national and international levels—as well as most of Nevada’s politicians—have attempted to discredit their work. Once the DOE makes its recommendation, the State

of Nevada is sure to exercise its option under federal law to object to the department’s decision. Thus, years of legal wrangling, Beltway politicking and perhaps even civil disobedience lie ahead. But the federal government has the power to end the Battle of Yucca Mountain almost immediately. All that is needed is the political will to enact a market-based solution to this government-created problem.

First, the material that will fill most of the proposed repository—used nuclear fuel generated by commercial reactors—needs to be understood for what it truly is: not waste to be buried and forgotten, but a commodity to be bought and sold in the marketplace. The best way to bring about this shift in attitude is to dissolve the DOE, as Energy Secretary Spencer Abraham proposed when a U.S. Senator. The department’s vital role in nuclear-weapons management, testing and disposal should be transferred to the U.S. Department of Defense, where it properly belongs. But the DOE should be relieved of its responsibility to dispose of highly radioactive materials from commercial and research reactors. Congress should appoint a commission to develop an equitable process by which the Nuclear Waste Fund, which the ratepayers of nuclear utilities have contributed to for almost 20 years, is divided up and disbursed to the entities now in possession of spent nuclear fuel. Additional funds for private-sector disposal can be

raised by auctioning off the DOE's non-weapons-related research facilities, equipment, vehicles and much of its 2.4 million acres of land. In exchange for relinquishing its legal authority to compel the federal government to take care of its leftovers, the nuclear-power industry will receive an economic windfall that will empower it to seek new and innovative answers to its used-fuel quandary.

Abolishing the DOE, transferring its responsibility for nuclear weapons to the military and inviting the private sector to attack the spent-nuclear-fuel problem is not as radical a notion as it may seem. Every proposal in this paper has been made by at least one responsible voice in the nuclear-waste debate—from federal bureaucrats to elected officials, nuclear-policy analysts to industry spokesmen. But no one has yet outlined the fundamental shift in paradigm needed to let these alternatives flourish. Herewith, the Nevada Policy Research Institute sets forth a plan to end the Battle of Yucca Mountain once and for all—and in so doing benefit taxpayers, create new jobs, protect the environment and perhaps even contribute to energy efficiency in America.

### **Those Were the Days...**

One of the great ironies of the radioactive-waste controversy is the fact that utilities never wanted to get into the nuclear business in the first place. As historians of America's

nuclear industry recognize, it was the federal government—not greedy, environmentally insensitive capitalists—that drove the development of a commercial nuclear industry in the United States. In the '50s and '60s, a peculiar notion dominated public discourse: that a "partnership" between Big Government, Big Labor and Big Business would defeat international communism, foster endless economic growth, end poverty and disease at home and abroad, harness cutting-edge energy and transportation technologies and even colonize space. With the benefit of experience, it is now clear that the "pay any price, bear any burden" attitude of the New Frontier-Great Society era was seriously naïve. But at the time, belief in American-style central planning was largely unquestioned.

The dominating zeitgeist, however, was not enough to convince utility executives that nuclear power was a good investment. Fission was a young technology, and it bore the terrible stigma of its introduction to the world at Hiroshima. Elites in Washington, however, were committed to using nuclear reactors to produce electricity "too cheap to meter." As always, politicians and energy bureaucrats believed that they knew better than anyone else. And through carrots (subsidies, tax breaks and liability limits) and sticks (threatening to hand nuclear technology over public "corporations" that would then compete with investor-owned

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utilities), the federal government exerted heavy pressure on electricity firms to get on the nuclear bandwagon. Unfortunately, timid utility executives chose not to expose this massive and misguided government push to impose an immature technology on America. Rather than use its lobbying clout to convince Congress to allow the industry to pursue fission reactors at its own pace, the government-regulated utilities knuckled under. Spurred on by starry eyed central-planners—and assuming that the rapid growth of America’s postwar electricity appetite would continue far into the future—utilities began to order plants, and the public-private partnership that is nuclear power in America began in earnest. Today analysts from across the ideological spectrum agree that were it not for the federal government, the postwar boom in commercial nuclear reactors would not have happened. Robert J. Duffy, in his book *Nuclear Politics in America*, wrote that “the nuclear power industry is ... the product of an unprecedented partnership between the federal government and private enterprise, and the industry owes its existence to decades of federal support and protection.” Bruce L. Welch, writing in the left-liberal *The Nation*, called nuclear power “wholly and completely a product of government design, promotion and subsidy.” Jerry Taylor and Peter VanDoren of the libertarian Cato Institute agree: “In the final analysis,

the nuclear industry is purely a creature of government.”

### **Deal with the Devil**

In nuclear power’s heyday—from the ‘50s to the ‘70s—utilities built ever-bigger plants, even though the technology in those plants was in its infancy. At the time, there seemed few clouds on the horizon. For the most part, the public did not oppose the construction of reactors. Energy regulators at the state level—the people whose job it was to “protect ratepayers”—enthusiastically approved plant after plant. And the federal government was an immensely helpful partner. But when economic and political conditions changed, nuclear power found itself in a precarious position. Since the industry was not the product of marketplace discipline, it was wasteful and often appallingly inefficient, unable to adjust to shifting economic realities. In the ‘70s, a series of colossal—and avoidable—blunders by the federal government created both economic stagnation and the “energy crisis.” Conservation quickly became the fashion, and growth in electricity demand ground to a stop. Investment capital for nuclear plants dried up, and utilities found they could no longer fund construction of reactors through profits from their fossil-fuel plants. Also, it soon became clear that nuclear reactors were not as price-competitive as federal “experts” had predicted. Recession, soaring energy prices and

conservation-minded ratepayers all revealed the vulnerability of the nuclear industry.

Mismanagement by utilities was a major cause of the nuclear bust, but a new political force was also a contributor. In the '70s, radical anti-technology groups began to exploit the public's reservations about all things nuclear. Breathless reporting by a superficial, uninformed media fed people's fears. State and local elected officials, sensing the shifting political winds, shifted with them and began erecting obstacles to new plants. At the federal level, the nuclear industry found itself the target of "regulatory ratcheting," a process by which new rules were piled on without ever reviewing the effectiveness of old rules. Federal research and development projects for the industry were scaled back. The Atomic Energy Commission, the government agency which created the nuclear-power industry and had remained devoted to its offspring for decades, was dissolved in the '70s. A major regulatory reorganization created the Nuclear Regulatory Commission (NRC), charged with licensing nuclear facilities, and the Department of Energy, charged with an unconnected series of tasks—including managing America's nuclear-weapons arsenal, continuing the federal government's commercial nuclear research programs and handling issues of waste. In addition, new federal bureaucracies with no history of industry coopera-

tion, particularly the Environmental Protection Agency, began flexing their regulatory muscles. Nuclear utilities discovered that industries that live by government can also die by government. In 1979, the one-two punch of the widely hyped Three Mile Island incident and the release of the film *The China Syndrome* forever changed the public's perception of nuclear power.

The salad days were over. No reactors have been ordered since the late 1970s. In the seven years following the Three Mile Island mishap, 52 reactor orders were canceled. By 1999, half of all reactor orders ever placed had been canceled. Today, the federal government still protects the industry through liability limits, and as it does for many large industries, every year it still spends hundreds of millions of taxpayer dollars on corporate welfare. The nuclear "partnership" still exists, but it's a shadow of what it once was.

### **Jimmy Says No**

Perhaps the most severe federal betrayal of its nuclear partner came in 1977, when President Jimmy Carter issued an executive order that would soon spark the skirmish that continues to this day over a national repository for spent fuel. Reactor fuel is comprised of small pellets of enriched uranium inserted into long metal tubes. Nuclear reactors use these rods, which are bound together in "fuel assemblies," to heat water into steam

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that powers electric turbines. The fuel is “spent” when it can no longer efficiently sustain the generation of power. The assemblies are then removed from the reactor and replaced with fresh fuel. But after their tour of duty in the reactors, the used fuel rods are now far more radioactive than when inserted. If not properly shielded by multiple barriers, they now pose a deadly threat to the environment.

Despite their potentially lethal radioactivity, however, used fuel assemblies are not “waste.” In the early days of the government-industry nuclear partnership, the expectation was that spent fuel would be recycled. The material in used fuel assemblies can be treated through a chemical process and made into mixed-oxide (MOX) fuel, which also can be “burned” in nuclear reactors. The MOX process does not completely eliminate highly radioactive waste—there is still the need to safely store reactor byproducts. But such recycling can dramatically reduce both the volume and radioactivity of the nuclear-fuel cycle's final waste material. The industry had assumed that recycling would always be an important part of America's nuclear future—after all, that was official government policy—and so firms started to construct three MOX plants: in Illinois, South Carolina and New York.

But before a healthy MOX industry in America had time to grow, Carter strangled it in its crib. Citing

concerns that recycling could produce plutonium for nuclear bombs just as easily as fuel for commercial reactors, he issued an executive order banning the production of MOX.

Nonproliferation arguments had convinced the new president that recycling spent fuel was too great a risk to the nation's security. And though President Reagan rescinded Carter's order, it was re-issued by President Clinton.

**Debacle in the Desert**

The mandate that reactors use the wasteful “once through” process left the industry and nuclear bureaucrats with a serious problem: If the volume of spent fuel could not be reduced through recycling, what was to become of the thousands of leftover assemblies? Every nuclear facility had on-site storage pools where used fuel was immersed for temporary storage, but a permanent solution was now needed. Years of political squabbling ultimately produced the Nuclear Waste Policy Act (NWPA), passed by Congress in 1982 and signed into law by President Reagan in 1983. The NWPA reaffirmed the longstanding policy of federal responsibility for spent nuclear fuel. The act also codified what many scientists had recommended for years—that “deep geologic disposal” was the safest way to ensure that highly radioactive materials never contaminated the environment.

Nuclear-policy watchers and many

Nevadans are well aware of what happened after passage of the NWPAs. The DOE's record of politically inspired policy shifts, massive mismanagement and missed deadlines is enough to make one dizzy. Here are just a few low-lights:

- ◆ *Repository site-selection shenanigans:* Long before the enactment of the NWPAs, the federal government declared that science alone would determine the locations of the nation's nuclear repositories. But as even a public-policy greenhorn could have predicted, politics affected the decision-making process from the start. First the decision to build repositories in both the East and West was abandoned by the DOE, in favor of a single site in the politically weak West. In 1987, Congress amended the NWPAs so that only one site—in a state with only a four-person congressional delegation—was picked for study, even though there were other promising sites that could have been investigated. The choice to forego the competitive process so early in the repository program naturally enraged many Nevadans, including (of course) its politicians. It also raised the specter that a “silver bullet” might be discovered that would one day render all previous work at the site useless. This prospect, in turn, gave federal officials a strong incentive to ignore evidence that might disqualify the

site at Yucca Mountain.

- ◆ *Changes in repository design:* Early in the Yucca Mountain program, DOE officials contended that natural barriers—dry air, volcanic rock, a low water table—would be the primary means by which radiation would be kept in the repository. In recent years, however, the DOE has shifted its strategy to reliance on engineered barriers to radioactive releases. Many believe this change of focus is tantamount to an admission that the radiation-containing qualities of Yucca Mountain are weaker than originally believed.
- ◆ *Temporary storage or not?:* Originally, the federal government planned to build a monitored retrievable storage (MRS) facility that would collect spent fuel rods for eventual geologic burial. But federal law required the DOE to apply for a license for a repository before starting work on a MRS facility. Since the repository was years behind schedule almost from the start, a MRS facility was never built. More recently, many on Capitol Hill have pushed for an interim storage facility near Yucca Mountain. But during the last few congressional sessions, supporters and opponents fought each other to a standstill. The recent takeover of the Senate by the Democrats—and their assistant majority leader, Nevada's Harry

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Reid—has all but guaranteed that interim-storage legislation will not pass anytime soon. The federal government has failed to achieve its goal to build a preliminary facility for the spent nuclear fuel that continues to pile up at reactors across the country.

- ◆ *Complete failure to meet its legal obligation:* The NWPA required the DOE to begin removing spent nuclear fuel from power plants by January 31, 1998. In 1987, the department announced that it would miss this deadline by five years. In 1989, another delay was announced. Today, the DOE is well over a decade behind schedule, and it has not even begun to construct the repository. The nuclear industry has filed lawsuit after lawsuit against the department because of its failure to meet its statutory and contractual obligation to assume responsibility for spent nuclear fuel.

The Yucca Mountain fiasco is easy to understand when one examines the nature of the bureaucracy in charge of the project. It would be difficult to count the number of studies, investigations and audits that have exposed the DOE's incompetence. The General Accounting Office, the investigative arm of Congress, seldom has kind words for the department. In 1995, the GAO found that the DOE "suffers from significant management problems, ranging from poor environ-

mental management of the nuclear weapons complex to major internal inefficiencies involving poor contractor oversight, inadequate information systems and workforce weaknesses." In 1999, the GAO ripped the department for "longstanding weaknesses" and for failing "to respond to reports by GAO, external experts and its own consultants that highlight these weaknesses." The DOE's three highest-profile missions—cleaning up the massive radioactive pollution created by nuclear-weapons production, operating a geologic repository for spent nuclear fuel and promoting "green" energy sources such as solar, wind, and geothermal—are all colossal failures. Mismanagement, waste and delays have sent the cost of nuclear-weapons cleanup soaring, the spent-fuel repository program is a boondoggle and renewable-energy sources make an infinitesimal contribution to the nation's electricity grid. The DOE is, in the words of former congressman John Kasich, a "bureaucratic monstrosity." It is time to transfer the department's weapons obligations to the military and privatize all that remains. As the Cato Institute's congressional handbook puts it, "There is no more reason for a department of energy than for a department of automobiles."

**Balance Transfer**

If the federal government cannot solve the nation's used-nuclear-fuel crisis, does that necessarily mean that



the private sector can? If recent evidence is any indication, the answer is an unqualified yes. When the bosom-buddies relationship between nuclear power and the federal government in the '50s and '60s became strained in the '70s and '80s, many predicted a quick death for the industry. The exact opposite occurred. Nuclear power survived, and by the '90s, the industry was thriving as never before. The number of automatic reactor shutdowns due to safety warnings has plummeted in the last 20 years, from over 7 per 7,000 hours of operation in 1980 to under 1 today. According to the industry's lobbying organization, last year, for "the ninth straight year, U.S. nuclear plants exceeded the industry's year 2000 goal for the availability of three key plant safety systems—two main cooling systems and back-up power supplies used to respond to unusual situations. Ninety-six percent of the key safety systems met their availability goals last year." The improvement in capacity factor—the percentage of maximum electricity a plant can add to the grid—has been stunning. In 1980, average capacity factor for the industry was 58 percent. In 1990 it had risen to 66 percent. Today it exceeds 80 percent. Earlier this year the Utility Data Institute announced that in 1999, it cost less to generate electricity at nuclear plants than it did at coal, natural gas and oil plants. In 2000, nuclear plants generated a record amount of elec-

tricity, even though recent years have seen the permanent shutdown of over a dozen reactors.

Why this renaissance? Nuclear advocate William Tucker explains what happened: "Basically, nuclear power escaped the claustrophobic environment of regulated utilities and federal bureaucracy and entered the private sector. More than one quarter of the nation's 103 reactors are now 'merchant' plants—owned by the new independent energy companies rather than the regulated utilities of yore." Simply put, the nuclear industry got a dose of market reality, and grew up. But nuclear power still has one responsibility to assume before it achieves full adulthood: It needs to take out the trash. By now it must be clear to nuclear executives that the federal government's program to dispose of their industry's spent fuel is a dismal failure. Billions have been wasted on studies and designs for a repository that might never be built, and utilities have been forced to spend millions to safely maintain spent fuel that is no longer their legal responsibility. Clearly, it's time to look at a new approach.

For almost 20 years, electricity customers who get their power from nuclear plants have been contributing to the Nuclear Waste Fund. This account (a fraction of a cent for every nuclear kilowatt) is earmarked to cover the costs of the nation's nuclear repository. Much of the money in the account—about \$5.5 billion—has

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been poured into the Black Hole of Yucca Mountain. But there is even more money—almost \$10 billion—left in the till. This huge sum, when augmented by the auctioning-off of the DOE's non-weapons infrastructure, could go a long way toward finding numerous alternatives to a repository at Yucca Mountain.

### **Recycling Is Not Risky**

An action the federal government could take to help the private sector produce one of those alternatives is to lift the ban on nuclear recycling in America. Jimmy Carter and Bill Clinton may believe that the recycling of nuclear fuel poses a national-security risk, but many scientists dissent. "Carter and Greenpeace to the contrary," writes physicist James Gordon Prather, "the plutonium produced in an ordinary power reactor is not nuke weapon useable." Richard Rhodes and Denis Beller, in the January/February 2000 issue of *Foreign Affairs*, agreed: "Although power-reactor plutonium theoretically can be used to make nuclear explosives, spent fuel is refractory, highly radioactive, and beyond the capacity of terrorists to process. Weapons made from reactor-grade plutonium would be hot, unstable, and of uncertain yield. ... Ironically, burying spent fuel without extracting its plutonium through reprocessing would actually increase the long-term risk of nuclear proliferation, since the decay of less-fissile and more-radioactive isotopes

in spent fuel after one to three centuries improves the explosive qualities of the plutonium it contains, making it more attractive for weapons use."

The last way for terrorists to easily obtain nuclear material would be to rob a MOX facility in the United States. The far more tempting target is the former Soviet Union's existing stockpile of literally hundreds of thousands of kilograms of fissile material. Every year the United States and other Western governments spend billions of dollars on efforts to secure this stockpile, but Russia has not been entirely forthcoming about the amount and locations of the uranium, plutonium and other materials that terrorists could use to make crude nuclear weapons. The notion that terror groups would look to the United States instead of the former Soviet Union to procure weapons-grade nuclear material is not tenable. Nor is Russia alone. Nuclear plants are either operational, under construction or in the planning stages in many nations that are not close allies of the United States, including India, Pakistan, Egypt, Iran, Brazil, China and Iran. The nuclear genie left the bottle long ago—17 percent of the planet's electricity is now produced by fission, and over 400 reactors on six continents provide power to over a billion people in 31 countries. Fortunately, the risks posed by the spread of nuclear materials shrink every day as safety know-how expands around the world.

In post-September 11<sup>th</sup> America, there is no question that the United States is the target of terrorists who would strike with any weapon they might be able to secure. But there is also a widespread recognition that the nation's heightened awareness of that reality—and the steps that are being taken—are making America more realistically secure than at any time since this terrorist war was covertly launched in the early '90s.

### **Making a MOX Market**

There is another reason why worries over recycling nuclear fuel in the United States are unfounded: If legalized, MOX or other reprocessing startups will not suddenly sprout up in every corner of the nation. Although the price of fresh nuclear fuel is low today, that situation is not likely to persist. As the Environmental Policy Project's S. Fred Singer notes, "perhaps in 20 years and certainly within 50 years," the supply of high-grade, easy-to-reach uranium deposits will dwindle. "At that point," writes Singer, "reprocessing of the stored fuel will make economic sense, because of the recycling of fissionable uranium and plutonium into reactor fuel, and the recovery of other elements whose worth we cannot even estimate at this time. After all, isn't conservation of resources a desirable objective?"

What can be done with spent fuel until recycling it becomes economical? The nuclear industry currently uses rugged, NRC-regulated canisters

that can contain fuel assemblies' radioactivity for at least a century. These steel or steel-reinforced-concrete casks are already used by decommissioned reactors and nuclear facilities whose cooling pools are full. The industry is increasingly recognizing that secure, monitored, "dry-cask storage" is a workable response to the federal government's broken repository program. A consortium of utilities has already contracted with an Indian tribe in Utah to construct a facility for storage of excess fuel assemblies, and a group of Wyoming businessmen has plans for a similar storage site in their state. With the release of monies from the Nuclear Waste Fund, regional dry-cask centers could be built. Fortunately, most nuclear reactors in the United State are concentrated in four regions: the Southwest, Upper Midwest, Southeast and Northeast. And though not-in-my-backyard attitudes prevail in most American communities, it's likely that at least a few isolated towns or counties in each region would be attracted to the revenue that flows from hosting a dry-cask facility. (Obviously, federal safety regulations for such storage sites should be strictly enforced.)

As we have seen, the low price of uranium in the short term means that lifting the ban on domestic MOX will not bring about an instant market for recycled nuclear fuel in America. But it could allow the private sector to plan for a future when it will be more

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economical to recycle waste than to search for new uranium deposits.

What role might venture capital play in the used-fuel-assembly market? How can engineers and physicists design better, cheaper and safer ways to store spent fuel until it becomes more valuable? Would nuclear utilities with excess storage space like to raise revenue by storing spent fuel from decommissioned reactors? Answers to these questions can be found once the federal government lifts its indefensible ban on recycling nuclear fuel and abandons the Yucca Mountain program.

### **Do They Know Something We Don't?**

Even if public opinion and political opportunism keep nuclear recycling from becoming a reality, that does not mean American spent nuclear rods cannot become MOX fuel. Many foreigners think the plan to entomb barely used fuel rods in Yucca Mountain is akin to scrapping an automobile because it is out of gas. Thus, other nations have not followed America's anti-recycling policy. Rhodes and Beller describe the growing, global MOX marketplace: "France and the United Kingdom currently reprocess spent fuel; Russia is stockpiling fuel and separated plutonium for jump-starting future fast-reactor fuel cycles; Japan has begun using recycled uranium and plutonium mixed-oxide ... fuel in its reactors and recently approved the

construction of a new nuclear power plant to use 100-percent MOX fuel by 2007."

Russia's plan is particularly ambitious. Its Nuclear Power Ministry will soon begin importing 20,000 metric tons of used nuclear fuel. The nation has a 25-year history of successful transportation and recycling of fuel rods, and its importation program could net Russia as much as \$20 billion—money that is badly needed to clean up Soviet-era nuclear pollution. Russia's plan has already caught the interest of several nations, including Switzerland and Taiwan. If its storage and reprocessing facility is successful, perhaps the current limit of 20,000 metric tons will be expanded. Recycling facilities in France, the United Kingdom and Japan might also desire America's spent fuel sometime in the not-too-distant future, and the global growth of nuclear power makes it probable that other nations will soon be interested. With the right modifications to federal export restrictions, the cure for American utilities' nuke-waste blues may be as simple as loading spent fuel onto ships and waving goodbye to it forever.

### **Good Mutations**

Recycling is not the only alternative to burying used nuclear fuel. Julian Simon, the legendary debunker of anti-technology and junk-science myths, had nothing but optimism for used-fuel rods' future: "We do not need to think of a very long period ...

when we consider storing nuclear waste; we only need to worry about a few decades or centuries. Scientists and engineers will be producing a stream of ideas about how to handle the waste even better, and indeed, will probably find ways to put the waste to such a use that it becomes a commodity of high value.” Simon’s prediction is already coming true, as scientists from all over the world research ways to not only reduce the radioactivity of nuclear material, but put it to use in entirely new ways.

It may sound farfetched to the uninformed, but many in the scientific community are convinced that breakthroughs in radiation-reduction techniques are not far off. Because the technology is so new, it’s impossible to predict the price tag for the “transmutation” process. (One DOE report claimed that the cost to reduce the radioactivity of America’s spent fuel would be \$280 billion.) Transmutation research is currently underway at several corporations and universities. And the federal government—despite its unswerving commitment to a repository at Yucca Mountain—has stepped up funding on a number of transmutation projects, including programs at its Lawrence Livermore, Oak Ridge and Los Alamos laboratories. The DOE has even started to discuss cooperative ventures with other nations. The department reports it has had “very substantive conversations with France, Japan, Russian and Switzerland.” Transmutation has many

boosters abroad. Dr. Ian Corbett of the United Kingdom’s Particle Physics and Astronomy Research Council believes the technology shows promise: “The problem of waste from nuclear energy is well-known. The transmutation process offers very good prospects of dealing with this problem in an environmentally safe way. It has the potential to transform the future of nuclear power generation.” Last year an Organization of Economic Development and Cooperation forum concluded that transmutation was “a promising technology whose potential benefits deserve the attention of policymakers in all countries” with nuclear power. Transmutation is just one of what might someday be many disposal alternatives for spent nuclear fuel. For example, three scientists at the University of Nevada-Las Vegas are working on a procedure that will dilute the uranium and plutonium of spent rods while at the same time producing electricity and tracers for medical procedures.

From both the public and private sectors, transmutation and related technologies are receiving more attention than ever. But consider how much more rapidly such research projects could progress if backed by significant support from the Nuclear Waste Fund. Nuclear utilities that are not interested in placing their spent fuel on the foreign or domestic MOX market could use their portion of the fund to set up facilities to advance transmutation research and study

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entirely new processes. If such research were to find a cheap, safe way to reduce spent fuel's radioactivity and produce beneficial products, the economic benefits could be immeasurable.

### **Conclusion**

For decades, federal politicians and nuclear bureaucrats have focused on only one plan for the nation's highly radioactive waste: the construction, operation and eventual closure of a geologic repository. Meanwhile, a revolution in market-oriented public policy has swept across the globe. From pensions in Chile to airports in Europe to long-distance phone service in the United States, deregulation and privatization have benefited taxpayers, improved the lives of workers and consumers alike and spurred the development of new technologies. What Nobel Prize-winning economist Friedrich von Hayek called "the fatal conceit"—that public-sector planners make wiser decisions than individuals acting in their own self-interest—has long been exposed as a bankrupt delusion that blocks needed solutions

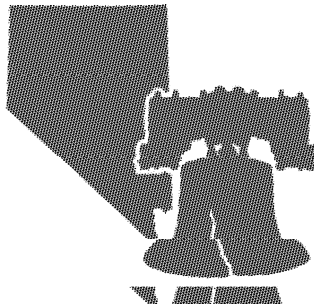
to public problems.

Yet American high-level waste policy has remained untouched by the revolutionary power of Hayek's insight. The DOE plods along as it has for years, still insisting that a monolithic, bureaucrat-run and failure-ridden program is the way to deal with spent nuclear fuel. Stuffing it in a mountain in Southern Nevada, says this medieval mindset, is better than allowing the private sector to develop new and dynamic solutions. For its part, the nuclear-power industry has been willing to let the Battle of Yucca Mountain drag on and on, because it lacks the money and the will to look for superior alternatives. In 1998, an executive at a decommissioned nuclear plant with leftover fuel assemblies expressed the industry's attitude to a *New York Times* reporter: "This wasn't supposed to be our problem."

It's time to admit that the Nuclear Waste Policy Act, while largely well-intentioned, has been a complete failure. It's time to empower the private sector to find answers to the question of what to do with America's spent nuclear fuel.

## About the Author

**D. Dowd Muska** joined the Nevada Policy Research Institute in February of 1997, writing and recording the Institute's radio commentaries. A few months later, he became NPRI's director of publications, overseeing our opinion editorials, issue briefs, and e-mail projects. Dowd's writing has appeared in almost every Nevada newspaper, as well as many national publications, including the *Wall Street Journal*, *New York Post*, *Washington Times*, and *Human Events*. He has also been a guest on many radio and television programs in Las Vegas and Reno.Nevada.



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