Yucca Mountain News

Fall 2007

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This newsletter is a publication of the Churchill County Repository Planning and Oversight Program. Funding provided to Churchill County is paid by users of electricity generated by nuclear power plants, under a general contract with nuclear generating utilities. The federal government collects a fee of one mill (one-tenth of a cent) per kilowatt-hour from utility companies for nuclear generated electricity. The money goes into the Nuclear Waste fund which is used to fund all program related activities.

Going Nuclear over Yucca Mountain

In the newspaper business, there's the "straight news lead" – an introductory sentence or two that should offer the plain, unvarnished facts about the story to follow.

Here's an example:
"The chairwoman of the Senate Environment and Public Works Committee plans a comprehensive hearing on the safety of the proposed Yucca Mountain nuclear waste repository."

Then there's the lead you might see in a column such as this one. It's a slightly different version of what you just read:
"Sen. Barbara Boxer, the California Democrat who would rather chew worms than watch the nation build a radioactive waste dump in Nevada's desert, will assemble anti-dump experts before her committee to make a case about the depository's flaws."

Not that we fault Boxer for this approach, because the simple fact is this: Although the issues surrounding construction of the Yucca Mountain dump are hugely technical, enormously complicated and best left to scientists, it is those with a keen political interest in the proposed repository – Boxer, President Bush, lawmakers who want radioactive waste out of their states – who will have the most to say about whether it gets built.

CRUNCH TIME APPROACHES

The Yucca Mountain dump has been decades in the making, but the coming months are a critical time for it. By next summer, the Department of Energy plans to go to the with an application for a construction license. From there, federal regulators will review the case for the dump – the geology, seismology, hydrology, transportation routes, waste canisters and more – to answer questions of great concern to lawmakers such as Boxer.

Can water infiltrate and carry radioactivity to drinking water? How easy might it be for terrorists to attack the facility? Could an earthquake damage waste canisters and release radioactive materials into the environment? Is it possible those canisters might corrode prematurely and expose their radioactive contents within the underground dump?

As the race to submit the license application accelerates, just about every hearing you'll read about – whether it's before Congress or before a regulatory agency – is likely to be too colored by politics to offer impartial answers to those questions.

If Bush could have his way, he would have opened Yucca Mountain yesterday to advance his nuclear-power-dependent energy initiative, which, to be successful, requires a place to store the resulting radioactive waste.

If a dump doesn't open, the courts will continue socking the Department of Energy with heavy penalties for failing to take the waste off the hands of reactor operators. And because the Department of Energy is ultimately answerable to the president, imagine the strings that will be pulled to make Yucca Mountain look as safe as a 6-year-old strapped into a Volvo.

IT'S ALL PERSPECTIVE

Ask just about any lawmaker in Nevada – Democrat or Republican, local councilman or the governor – to opine on the "science" of a nuclear waste dump at Yucca Mountain, and the consensus is that it's really bad for the environment and really, really bad for public health. It is a consensus practically unheard of in such a diverse group of politicians, except when it comes to matters of regional self-interest.
Boxer, who took the reins of the Environment and Public Works Committee after Democrats seized control of the Congress in the last election, has promised that in coming months she will assemble a hearing to examine the safety, health and permitting issues surrounding Yucca Mountain. For context: Boxer is a long and active foe of Yucca Mountain, having voted against it in 2002.

As for the Nuclear Regulatory Commission, it's a five-member body led by a Bush appointee who was once assistant to the secretary of Defense for nuclear and chemical and biological defense programs. Another is a former GOP staffer who had a long career at the Los Alamos National Laboratory. And a third once worked for Senate Majority Leader Harry Reid of Nevada, who would just as soon toss a grenade at the dump site as look at it.

Now that should make for some lively discussions – all of them based purely on science, of course. *Source: Union Tribune*

Nuclear Power's New Age

Some countries never lost their enthusiasm for nuclear power. It provides three-quarters of French electricity. Developing countries have continued to build nuclear plants apace. But elsewhere in the West, Chernobyl, along with the accident at Three Mile Island in Pennsylvania in 1979, sent the industry into a decline. The public got scared. The regulatory environment tightened, raising costs. Billions were spent bailing out lossmaking nuclear-power companies. The industry became a byword for mendacity, secrecy and profligacy with taxpayers' money. For two decades neither governments nor bankers wanted to touch it.

Now nuclear power has a second chance. Its revival is most visible in America where power companies are preparing to flood the Nuclear Regulatory Commission with applications to build new plants. But the tide seems to be turning in other countries, too. Finland is building a reactor. The British government is preparing the way for new planning regulations. In Australia, which has plenty of uranium but no reactors, the prime minister, John Howard, says nuclear power is "inevitable".

Managed properly, a nuclear revival could be a good thing. But the industry and the governments keen to promote it look like repeating some of the mistakes that gave it a bad name in the first place.

It's going nuclear's way

Geopolitics, technology, economics and the environment are all changing in nuclear power's favour. Western governments are concerned that most of the world's oil and gas is in the hands of hostile or shaky governments. Much of the nuclear industry's raw material, uranium, by contrast, is conveniently located in friendly places such as Australia and Canada.

Simpler designs cut maintenance and repair costs. Shut-downs are now far less frequent, so that a typical station in America is now online 90% of the time, up from less than 50% in the 1970s. New "passive safety" features can shut a reactor down in an emergency without the need for human intervention. Handling waste may get easier. America plans to embrace a new approach in which the most radioactive portion of the waste from conventional nuclear power stations is isolated and burned in "fast" reactors.

Technology has thus improved nuclear's economics. So has the squeeze on fossil fuels. Nuclear power stations are hugely expensive to build but very cheap to run. Gas-fired power stations—the bulk of new build in the 1980s and 1990s—are the reverse. Since gas provides the extra power needed when demand rises, the gas price sets the electricity price. Costly gas has therefore made existing nuclear plants tremendously profitable.

The latest boost to nuclear has come from climate change. Nuclear power offers the possibility of large quantities of baseload electricity that is cleaner than coal, more secure than gas and more reliable than wind. And if cars switch from oil to electricity, the demand for power generated from carbon-free sources will increase still further. The industry's image is thus turning from black to green. Nuclear power's moral makeover has divided its enemies. Some environmentalists retain their antipathy to it, but green gurus such as James Lovelock, Stewart Brand and Patrick Moore have changed their minds and embraced it. Public opinion, confused about how best to save the planet, seems to be coming round. A recent British poll showed 30% of the population against nuclear power, compared with 60% three years ago. An American poll in March this year showed 50% in favour of expanding nuclear power, up from 44% in 2001.

Fear of fission

Yet the economics of nuclear still look uncertain. That's partly because its green virtues do not show up in its costs, since fossil-fuel power generation does not pay for the environmental damage it does. But it is also because nuclear combines huge fixed costs with political risk. Companies fear that, after they have invested billions in a plant, the political tide will turn once more and bankrupt them. Investors therefore remain nervous.

How, then, to get new plants built? America's solution is to lard the industry with money. That is the wrong answer. Nuclear and other clean energy sources do indeed deserve a hand from governments—but through a carbon tax which reflects the benefits of clean energy, not through subsidies to cover political risk. Exposure to public nervousness is a cost of doing business in the nuclear industry, just as exposure to volatile prices is a cost in the gas industry.

It may be that fears of nuclear power are overblown: after all, the UN figure of around 4,000 eventual deaths as a result of the Chernobyl accident is lower than the official annual death-rate in Chinese coal mines. Yet there are good reasons for public concern. Nuclear waste is difficult to dispose of. More civil nuclear technology around the world increases the chance of weapons proliferation. Terrorists could attack plants or steal nuclear fuel. Voters will support nuclear power only if they believe that governments and the nuclear industry are doing their best to limit those risks, and that such risks are small enough to be worth taking in the interests of cheap, clean energy.

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Water Use, Drilling go on

What began in June as a clear attempt by the state engineer to stop the Department of Energy from drilling boreholes at the planned Yucca Mountain nuclear waste site now appears as clouded as the muddy water that's in the center of the dispute.

At the close of business on Thursday, September 6th, DOE's acting director of the Yucca Mountain Site Operations Office sent State Engineer Tracy Taylor an overnight letter declaring that the so-called first phase of drilling that's been under way this year "is not affected by the cease and desist order (and) is anticipated to conclude by the end of September."

That means DOE intends to use an additional 191,000 gallons of Nevada's water, or more than half of an acre-foot, according to the letter from James W. Hollrith, acting director of the Yucca Mountain Site Operations Office.

That's enough water to supply one household in the Las Vegas Valley for a year.

Hollrith's letter came less than a week after U.S. District Judge Roger Hunt denied an emergency motion by U.S. attorneys representing DOE who sought to block Taylor's June 1 cease-and-desist order
.
Taylor's order was temporarily lifted on June 12 and then reinstated on July 20 when Department of Justice attorneys at the time said the conditions were "unacceptable."

Taylor had offered to let the Energy Department use the water for 30 days, but after that "the use of water for any bore hole drilling whatsoever is prohibited," he wrote in a July 16 letter.
That matches the tone of Hunt's 24-page ruling in favor of the state. In essence, his ruling said any DOE use of water for borehole drilling to collect rock samples needed to support a license application for constructing a repository and surface facilities was outside the scope of a court-approved agreement.

The state "faced the unauthorized use of its water, a violation of state water law, a violation of an agreement it entered in good faith, a violation of this court's order authorizing that agreement, and interference with its obligation to its citizens to enforce its laws and preserve its water," Hunt wrote in his Aug. 31 decision to deny the Justice Department's emergency motion.
Hunt's ruling let stand Taylor's June 1 cease-and-desist order. But that order only instructs DOE to "cease and desist the use of water for the second phase

Yucca Mountain site manager rebuffs order

of the bore hole drilling project," not the first phase that DOE continued to keep in operation.

Earlier that Thursday, September 6th, Taylor spokesman Bob Conrad said from the state engineer's perspective, "The cease-and-desist is meant to be for water use regardless of whether its Phase 1 or Phase 2."

About two hours later, though, in his letter to Taylor, Hollrith wrote: "DOE has decided to immediately discontinue using water for drilling and boring activities associated with the (Phase 2) borehole drilling program, as provided in your June 1" cease-and-desist order.

Conrad reacted, saying in an e-mail that the state engineer "has not read this letter. However, I can say that we appreciate the DOE halting the use of water" for Phase 2 drilling. ... We will continue discussions with the DOE regarding the use of water for Phase 1 drilling and other purposes."

Bob Loux, executive director of the Nevada Agency for Nuclear Projects and a longtime opponent of the Yucca Mountain Project, said, "For every day that goes by they're drilling and collecting data."

"The state engineer can issue a new cease-and-desist order. That's one of the ways to solve it," Loux said. "These guys (DOE officials) are being flagrant in light of the judge's order. We think they're thumbing their nose at the court."

The Department of Energy plans to go to the mat with Nevada over the disputed use of water at Yucca Mountain, the director of the federal nuclear waste project said Friday, Sept. 14th.

The government probably will appeal an adverse ruling made late last month by U.S. District Judge Roger Hunt, said Ward Sproat, head of the Office of Civilian Radioactive Waste Management.

Meanwhile, Justice Department lawyers along with attorneys for the state are due back in Hunt's courtroom in Las Vegas for a fresh round of arguments over water.

The DOE maintains some drilling is exempt, and it has continued to work in certain sections of the site.

Nevada Senior Deputy Attorney General Marta Adams, who represents Loux, said, "I'm going to explore every option to force DOE to comply with the court's order, which found that borehole drilling is an unauthorized purpose for use of Nevada's water, regardless of which phase it is."
"It doesn't really go to the heart," Adams said.

Sproat declined to answer questions about the impact any drilling halt would have on the repository project, saying he was advised by Justice Department lawyers not to discuss it.

The Energy Department is collecting rock samples to analyze the earthquake and flood safety of large-scale industrial buildings it plans to construct to handle canisters of highly radioactive spent nuclear fuel.

The analysis would be incorporated into a repository license application DOE has said it will file with the NRC in June. DOE officials have said crews have drilled 56 holes out of 80 that were planned.

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Water Use, Drilling go on (Continued)

Water from wells near the site is used to cool and lubricate drill bits and to create mud for extracting core samples from rock layers.

"I have a pretty good idea of what we got and what we didn't get" in the way of data from the holes already drilled, Sproat said.

"Some of them are nice to have and some of them are must-have," Sproat said. "It is what the engineers need to fully understand and describe what is underground there."

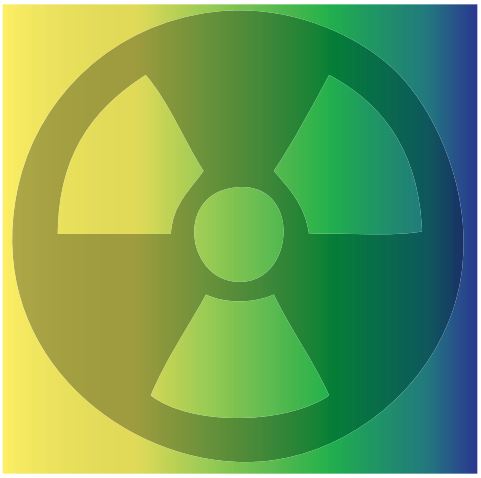
The issue of water rights at Yucca Mountain has been brewing since the late 1990s but largely on the back burner as Judge Hunt had declared the matter moot until the DOE could show significant progress.

In the meantime, Nevada state engineers have denied DOE applications for water uses beyond sanitation, fire-fighting and other emergencies.

The Energy Department has asked Congress to pass legislation that would broaden its powers to claim water from Nevada for the Yucca project. That proposal raised alarm bells in other Western states and has not advanced. *Source: Las Vegas Review Journal*

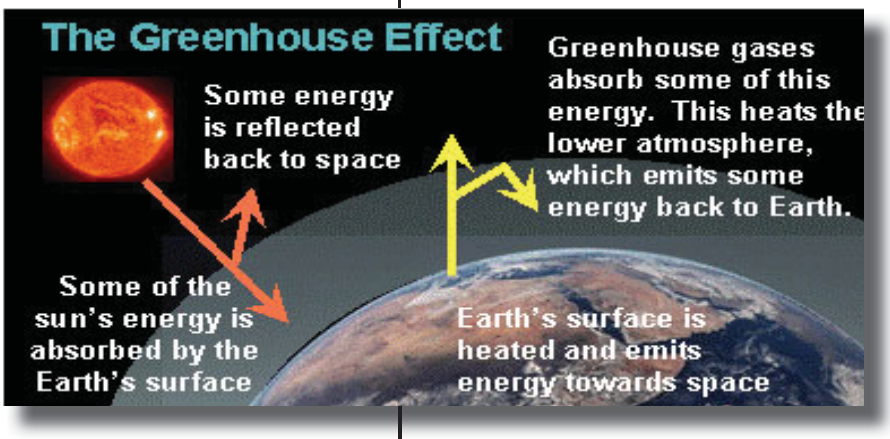
Nuclear Power's New Age (Continued)

One of the reasons why the public turned against nuclear power last time round is that it found itself bailing the industry out. It would be wrong, not just for taxpayers but also for the industry, to set up another lot of cosy deals with governments. The nuclear industry needs to persuade people that it is clean, cheap and safe enough to rely on without a government crutch. If it can't, it doesn't deserve a second chance. *Source: The Economist*



Global Warming Serious Enough To Lift Ban On Nukes?

Global warming has become a lot like the weather: Everyone talks about it, but nobody does anything about it.
In environmentally conscious California, a poll found that 54% of residents believe "global warming poses a very serious threat to the state's future economy and quality of life." But only 13% claim to carpool and 7% use mass transit.In other words: Do as I want you to do, not as I do.



Meanwhile the California legislature, reflecting the conventional wisdom, has passed a sweeping new greenhouse gas law that calls for a 25% reduction in carbon dioxide emissions by 2020 - while the state's population is projected to grow 20% to 44 million people.

Passing the law was the easy part. Now we implement.

Perhaps this is where the majority of Californians were right - but not for the right reason - when they agreed that "global warming poses a very serious threat to the state's future economy.

"Reducing greenhouse gas emissions by 25% in 13 years while growing the economy to support 7 million more people will, to put it mildly, be a challenge. Thirteen years is not a long time to dramatically change the way California uses energy.

Electrical generation accounts for 20% of the state's greenhouse gas emissions. More than half of these emissions come from burning natural gas that powers 42% of the grid. Coal contributes 16% of California's power, yet accounts for about 36% of its greenhouse gas emissions. A separate California law passed last year will phase out the use of conventional coal power over 20 years. Most of this power will be replaced by far more expensive natural gas, assuming adequate supplies can be secured.

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DOE to Ship Plutonium off Hanford

The Department of Energy could begin shipping weapons-grade plutonium and unused nuclear fuel off the Hanford nuclear reservation in 30 days.

Sending the material to Savannah River, S.C., will clear the way for the demolition of the Plutonium Finishing Plant and save more than $100 million in security costs. The plutonium is stored in a vault at the Plutonium Finishing Plant in central Hanford.

"This is a key part of the Department of Energy's efforts to dispose of plutonium," James Rispoli, DOE assistant secretary of environmental management, said in a media conference call mid September.

In addition to 2,300 canisters of plutonium from Hanford, DOE also plans to ship 700 canisters of plutonium from Lawrence Livermore National Laboratory in California and the Los Alamos National Laboratory in New Mexico. Each canister, the size of a large coffee can, can hold almost 10 pounds of plutonium, but their weights vary.

DOE notified Congress of its decision to consolidate plutonium at Savannah River on September 5th and must wait 30 days before shipments may begin.

"Once the 30-day notification runs, we plan to begin with the campaign at Hanford," Rispoli said.

DOE had planned an accelerated cleanup schedule at the Plutonium Finishing Plant where plutonium produced in Hanford reactors was made into metal buttons the size of hockey pucks for eventual conversion for weapons use.

But because of delays in shipping the plutonium from the plant, demolition work slowed in the last two years and some of the funds intended for cleanup of the plant were shifted to radioactive sludge vacuuming and removal at the K Basins.

DOE expects the nationwide consolidation of plutonium not yet made into nuclear weapons triggers to take about three years.

Once the weapons-grade plutonium and unused fuel left over from the Fast Flux Test Facility are removed from the Plutonium Finishing Plant, heavy security at the plant will be reduced, making cleanup there more efficient. DOE is required to have all the buildings in the complex, many of them heavily contaminated with radioactive material, torn down by 2016.

Under new security standards set after 9/11, the Plutonium Finishing Plant needs more than $100 million in security upgrades. However, those have been waived on the condition that the plutonium is shipped off site.

Savannah River has long been discussed as the site where plutonium would be consolidated. But before designating it as the consolidation site, DOE was required to prove it had a definite disposition path for the waste before adding more plutonium to the plutonium already stored there.

I appauld the leadership shown by DOE officials in achieving this plan," Rep. Doc Hastings, R-Wash., said in a statement. "Consolidation will make our country and community more secure, will save taxpayers' millions and will simplify Hanford cleanup." *Source: The Tri-City Hearld*

Global Warming (Continued)

Wind and solar power are being increased, but grid reliability is a problem. The wind in California has this unfortunate habit of peaking when its power is not needed and vanishing when it is. The sun in sunny California has its off days too. This requires both technologies to be backed up by additional natural gas plants that have to remain on costly standby. Solar power also continues to be very expensive.

California is already the most electrically efficient state in the U.S., so large additional conservation savings will be hard to achieve. A little over half the state's man-made greenhouse gases come from the tailpipe. But there aren't a lot of ways to significantly reduce these emissions while the state is growing so rapidly, though small cars could be mandated or favored through the tax code.

Burning corn as ethanol instead of eating it may be an attractive solution for a politician angling to win the Iowa presidential caucuses. But in the real world, the balance sheet of carbon combustion is unmoved by massive federal subsidies. Further, switching to corn-based fuel is already causing unintended inflationary pressures, as corn shortages have increased feedstock prices that in turn have driven up the price of milk, poultry, beef and pork. A fleet of hydrogen-electric cars could make a major impact on the problem - but only if we doubled our electricity production using low greenhouse gas technology such as solar, wind or nuclear. Of these, nuclear is the only reliable way to make electricity that could be affordable for anyone other than a San Francisco hedge fund manager.

That leaves four possible outcomes with California's Global Warming Solutions Act of 2006:

1. The regulations to reduce greenhouse emissions pose such a serious threat to the state's economy that politicians decide to delay the reduction mandate or simply rescind it, letting greenhouse gas emissions grow.

*2. A carbon cap-and-trade scheme is implemented, enriching a few traders on the floor of the Chicago Climate Exchange and serving as a massive fos*sil-fuel tax, leading to economic harm and reversal of the law.

***3.** Politicians and regulators ignore the economic consequences and wring a 25% carbon emissions reduction out of the California economy that causes havoc and misery. Then they get thrown out of office by mobs of angry unemployed people, whereupon their successors reverse the law.*

***4.** California gets serious about greenhouse gases, lifts its ban on new nu-*

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Global Warming (Continued)

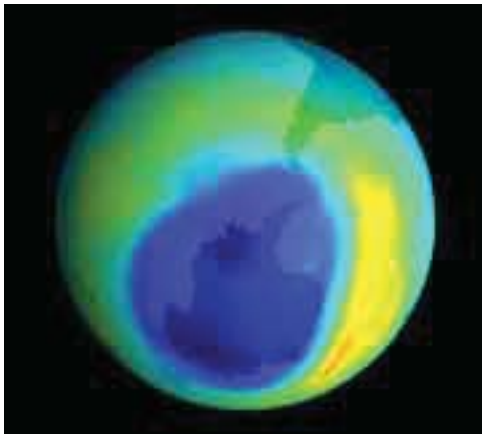
clear power plants, constructs four new reactors and, as a result, enjoys a large reduction in carbon emissions from the electrical sector and a small reduction overall. Additional reactors would yield further greenhouse gas reductions.

Construction of nuclear plants, however, has been banned in California since 1976. But the four reactors under construction then were allowed to be finished. Today, those reactors furnish about 13% of state's electricity.The four reactors save $2.6 billion a year in natural gas (a nuclear reactor can run on about $30 million of fuel for almost two years) while reducing greenhouse gas emissions by 22 million metric tons. Adding four modern reactors would let the electrical sector reduce greenhouse gas emissions by 40%, returning the sector to 1990 levels. Nuclear power has the lowest total life-cycle greenhouse gas emissions of any energy source, including solar and wind. In spite of this, the California legislature shows no interest in nuclear power.

Due to fears about global warming, public opinion about nuclear power has improved nationwide. California polls show likely voters closely divided on the question. Bypassing the legislature with a ballot initiative to overturn the state's obsolete 31-year ban on nuclear power might succeed following a serious public education campaign.

Unfortunately, California's risk-averse investor-owned utilities fear provoking the anger of environmentally liberal lawmakers by supporting such a ballot initiative. Instead, the utilities may try to build reliable and safe nuclear power plants out of state. But this means spending billions to build long-distance power transmission lines as well as billions more in fees to buy approval from the states over which the lines traverse. California ratepayers will pay for this in higher electrical bills. In addition, 15% of the power would be lost through long-distance line resistance. These added expenses mean that two reactors could be built in California for the cost of a single reactor built in New Mexico or Utah.

A total of 104 reactors now produce about 19% of America's electricity. By comparison, France's 59 reactors produce 78% of its electricity while environmentally conscious Sweden has 10 reactors that provide 48% of its power. Still, environmentalists fiercely oppose any new plants.
Their opposition is deeply rooted in our Cold War past and focuses on a single isotope created during the nuclear fission process: plutonium-239. With a half-life of 24,110 years, plutonium-239 would have to be stored for almost 200,000 years for its radioactivity to be rendered safe.



Each commercial nuclear power reactor makes about 500 pounds of plutonium a year. This plutonium is embedded in the fuel rods that in the U.S. are simply set aside and stored, with the plan being to store about a football field's volume of spent fuel rods at Yucca Mountain in Nevada. Environmentalists oppose this, arguing that Yucca Mountain cannot keep nuclear material safe for 2,000 centuries.

The issue of storing plutonium-239 for 200,000 years can be solved by extracting the plutonium and using it to produce electricity. The French do this, reducing the volume of used nuclear material by about 96% by recycling usable fuel, including plutonium, back into their reactors. This slightly increases the cost of electricity, but it eliminates the need to safely store plutonium-239, saving money on the back end.Unfortunately, many environmentalists oppose reprocessing spent nuclear fuel because reprocessing extracts plutonium that could be diverted for nuclear-bomb making. It was this rationale that caused President Jimmy Carter to ban U.S. reprocessing in 1977 in the hopes of inspiring other nations to do the same. (It didn't work.)

Environmental opponents speak darkly of "plutonium-in-commerce," as if a U.S. utility would sell 100 pounds of extracted plutonium to al-Qaida to boost its profits. The net result is that it gives the American environmental left a perfect and unassailable circular argument: Reprocessing is bad because plutonium can be made into bombs, but storing unreprocessed spent fuel rods with plutonium in them for 200,000 years is problematic.Ironically, nuclear power plants can be operated with plutonium recovered from nuclear bombs, turning nuclear swords into electrical ploughshares and using up the plutonium in the process.

For better or for worse, California often leads the way in American trends. What if Californians considered the relative risks and rewards of nuclear power vs. global warming, increased use of imported fossil fuels and massive electricity rate hikes, and decided in favor of nuclear power?

The California Energy Independence and Zero Carbon Dioxide Emission Electrical Generation Act slated for the June 2008 ballot will give Californians that choice. The proposed initiative overturns California's nuclear ban, enacts seismic and environmental restrictions that place about 40% of the state off limits to nuclear power, and approves on-site dry-cask storage of spent fuel as an acceptable storage method for 100 years.

California can get serious about meeting its ambitious global warming goals while providing economic opportunity, or it can try to power its economy on good intentions. *Reprinted by permission - article by Chuck DeVore legislator, novelist*

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