Nuclear Power
- flawed Greenhouse Solution

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19th IPPNW World Congress
August 28, 2010

- *PSR's contribution to stopping the "Nuclear Renaissance"*

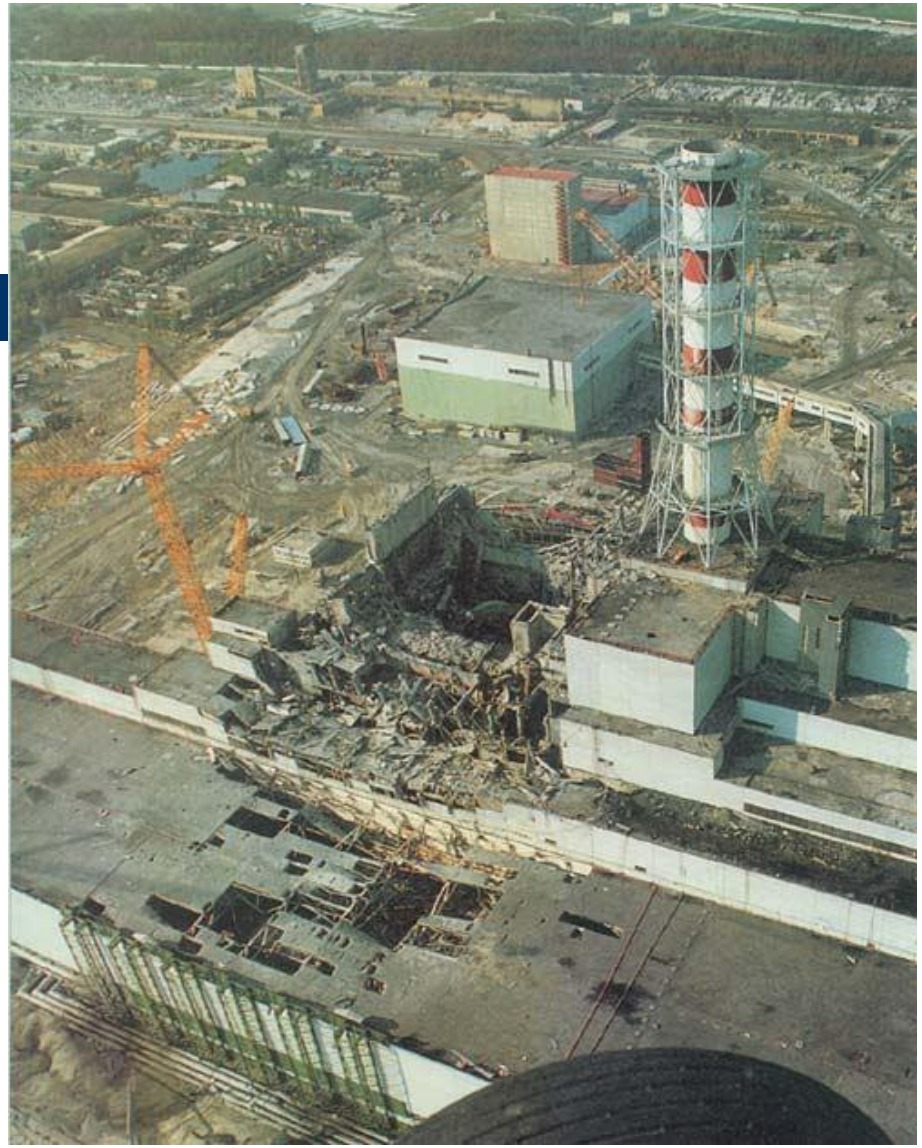
PSR® 1985 NOBEL PEACE PRIZE Physicians for Social Responsibility

PSR history advocating against nuclear power

Full page ad taken out in New England Journal of Medicine, highlighting danger of nuclear power - by chance, a few days after the accident at Three Mile Island plant, March 1979.

No New Plants for Decades

- 1959 to early 1970s, 112 reactors constructed
- Average capital costs increased nearly 10X
- Three Mile Island 1979 accident: $2 billion costs
- Chernobyl accident 1986
- None ordered since



Urgent Climate Crisis

- **We must address climate change with the fastest, cheapest and cleanest solutions**
- **Nuclear power meets none of these criteria.**
  One nuclear reactor would:
  - take at least 10 years to license and construct;
  - cost about $10 billion and costs are going up, not down;
  - produce 800 tons of spent nuclear fuel over its operating lifetime
- **For significant reduction of carbon emissions, 800 large reactors must be built globally by 2050,**
  or 1 reactor every 18 days for 40 years

2008 – PSR's new Safe Energy program

Fatal Flaws of Nuclear Power

No country has solved the problems of nuclear power:

- **Cost**
- **Radioactive Waste**
- **Safety**
- **Security**
- **Proliferation**

What is going to determine whether new reactors are built in the US?

- Unsolved waste disposal problem?
- Health & safety concerns?
- Security / terrorism fears?
- Proliferation risks?
- Biggest obstacle is economic
  - Industy's goal: shift the risk from the nuclear industry to taxpayers and ratepayers

Historical Construction Costs of Nuclear Power

Year Reactor Construction Started	Estimated Cost (1990$)	Actual Cost (1990$)	Percentage Over
1966-67	$560/kW	$1,170/kW	209%
1968-69	$679/kW	$2,000/kW	296%
1970-71	$760/kW	$2,650/kW	348%
1972-73	$1,117/kW	$3,555/kW	318%
1974-75	$1,156/kW	$4,410/kW	381%
1976-77	$1,493/kW	$4,008/kW	269%

David Schlissel, Synapse Energy

Trends continue currently

- **Finland: Areva building a 1,600 MW reactor**
  - Already 3.5 years behind schedule (started in 2007)
  - Cost overruns are at $2.7 billion so far
  - Same design that Constellation Energy wants to build in 4 US states
- **France: Areva building the same design in France**
  - Experiencing the same technical errors and safety flaws
  - Already 2 years behind schedule and at least 20 percent over budget

Current US energy policy is old policy: Energy Policy Act of 2005 *(EPACT)*

More than $13 billion in subsidies for nuclear power:

- R&D Subsidies
- Construction Subsidies
- Operating Subsidies
- Shut-Down Subsidies

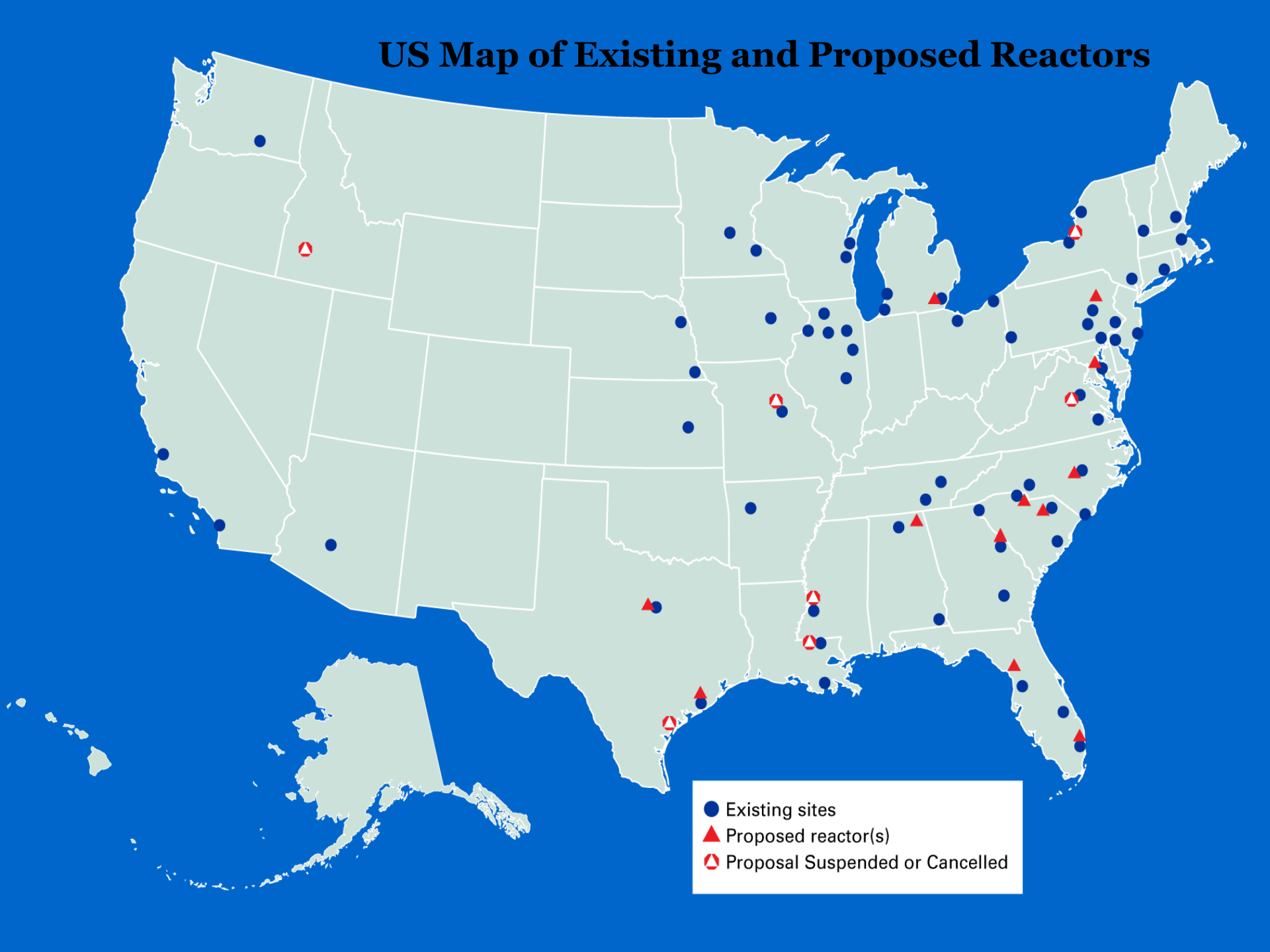
(note: $8.3 billion recently of those loan guarantees awarded to build two new reactors in Georgia. However reactor designs not yet approved by NRC.)

Only $3.2 billion for renewable energy tax breaks and $2.1 billion for efficiency and clean vehicles

Result of EPACT - 2005

- No new licenses had been applied for in the US in the prior 30 years, even after licensing process was "streamlined" in 1992
- After Energy Policy Act passed in 2005, 17 companies or consortia of companies applied for licenses to build 26 new reactors
- Most of the proposed reactors are in the Southeastern US and in Texas

US Map of Existing and Proposed Reactors



So, what's happening with the proposed new reactor projects?

Nearly all proposed reactor projects have experienced one or more of the following: cancellation, suspension, delay, utility credit downgrade, and increased costs.

- **3 Projects Cancelled:** ID, MO, AL (3 of 4 reactors)
- **3 Projects Suspended:** MS, LA, NY
- **7 Projects Delayed:** FL (2 projects), MD, AL, SC, NC, PA, TX
- **Utility Credit Downgrade:** FPL (Florida), Progress (Florida), SCG&E (South Carolina), PPL (Pennsylvania)

Why so many cancellations, suspensions, delays and utility credit downgrades?

- **Because cost estimates have soared since 2008 (costs are for 2 reactors unless specified):**
  - Texas ($5.8B to $18.2B)
  - Alabama($6.4B to $10.4B)
  - South Carolina($5B to $11B)
  - North Carolina ($4.4B to $9.3B)
  - Florida ($5.6B to $22.5B)
  - Florida ($8B to $24B)
  - Maryland ($2B to $9.6B) – one reactor
  - Pennsylvania ($4B to $13-15B) – one reactor

Citigroup analysis:
(Nov 2009)

"At no time, anywhere in the world, has a utility built a new nuclear power station and taken the full construction, power price, and operational risk"

&

Risks from new reactors "could each bring even the largest utility company to its knees financially"

The Washington Post

Nuclear projects face financial obstacles

By Steven Mufson
Washington Post Staff Writer
Tuesday, March 2, 2010; A01

Hopes for a nuclear revival, fanned by fears of global warming and a changing political climate in Washington, are running into new obstacles over a key element -- money.

A new approach for easing the cost of new multibillion-dollar reactors, which can take years to complete, has provoked a backlash from big-business customers unwilling to go along.

Financing has always been one of the biggest obstacles to a renaissance of nuclear power. The plants are expensive, and construction tends to run late and over budget. The projected cost for a pair of proposed Georgia plants would be $14 billion; the Obama administration last month pledged to provide them with $8.3 billion in federal loan guarantees.

So utilities have turned to state legislators and regulators to help contain capital costs. In states such as Georgia, Florida and South Carolina, utilities have won permission to charge customers for some of the cost of new reactors while construction is still in progress -- a financing technique that would save utilities a couple of billion dollars for each reactor. Previously, utilities had to wait until power plants were in operation before raising rates, as they still do in most states.

"We tell people it's like paying off the interest on your credit card as you go along, rather than letting it compound," said Suzanne Grant, a spokeswoman for Progress Energy.

But businesses and other electricity users in those states aren't buying that argument. Instead, they are saying utilities are pawning off much of the projects' liabilities on customers because bank lenders and investors will not take the risks.

"It's a terrible idea," said Jim Clarkson, a consultant with Resource Supply Management, a Georgia firm that advises companies on how to reduce electricity use. "We've had decades of subsidies for nuclear plants and all sorts of preferential treatment. They still require loan guarantees because the smart money won't touch them."

"Nuclear power is very important," says John W. McWhirter, who represents the Florida Industrial Power Users Group. "We just wish consumers could be protected."

The reaction of big businesses, as well as other consumers, has turned states that were bastions of support for nuclear power into hazardous territory. And it could thwart the Obama administration's efforts to jump-

Nuclear Power in the U.S. - 2010

- **Three companies awarded Early Site Permits**
  - Dominion at its North Anna, Virginia site
  - Exelon at its Clinton, Illinois site
  - Entergy at its Grand Gulf, Mississippi site
- **One company - $8.3 billion loan guarantee**
  - Southern at its Vogtle, Georgia site

What Nuclear Industry Wants

- **Increased research and development subsidies**
- **Increased construction subsidies**
- **Increased operating subsidies**
- **More streamlined licensing**
- **$100 billion more government loan guarantees**
  - Private investors weren't interested even before current credit crisis
  - Risk of default for a nuclear reactor is "very high – well above 50 percent" (Cong. Budget Office)

Congress generally supports nuclear subsidies

- **Republicans in favor of more nuclear subsidies**
  - Republican energy plan platform: 45 to 100 new reactors by 2030
- **Democrats are split, but largely in favor**
  - Fiscally conservative Democrats tend to be uncomfortable with loan guarantees generally
  - Liberal Democrats tend to oppose
  - Democrats from states where new reactors are proposed strongly support
  - More support when nuclear subsidies packaged with renewable energy subsidies

Why Does the Nuclear Industry Have So Much Support in Congress?

- Spent $600 million (!!!) on lobbying and nearly $63 million on campaign contributions over the past decade
- Increased campaign contributions to Democrats (they donated $9.6 million in 2008)
- Got support of 21 unions by promising future union jobs
- Recruited new champions – such as Sen. Murkowski (R-AK); highest recipient of campaign contributions
- Continuing to package nuclear subsidies with renewable subsidies

Even up against all that….
significant success include:

- **No new loan guarantee authority yet adopted this year**
- **Previously authorized $18.5 billion in loan guarantees won't go as far** because of escalation of construction costs (will only cover 2 projects, instead of 4 originally planned)
- **Defeated $50 billion in nuclear loan guarantees** in stimulus bill earlier this year
- **Congressional action has been stalled on climate and energy legislation;** not good for the climate crisis, however a relative success for nuclear power opponents

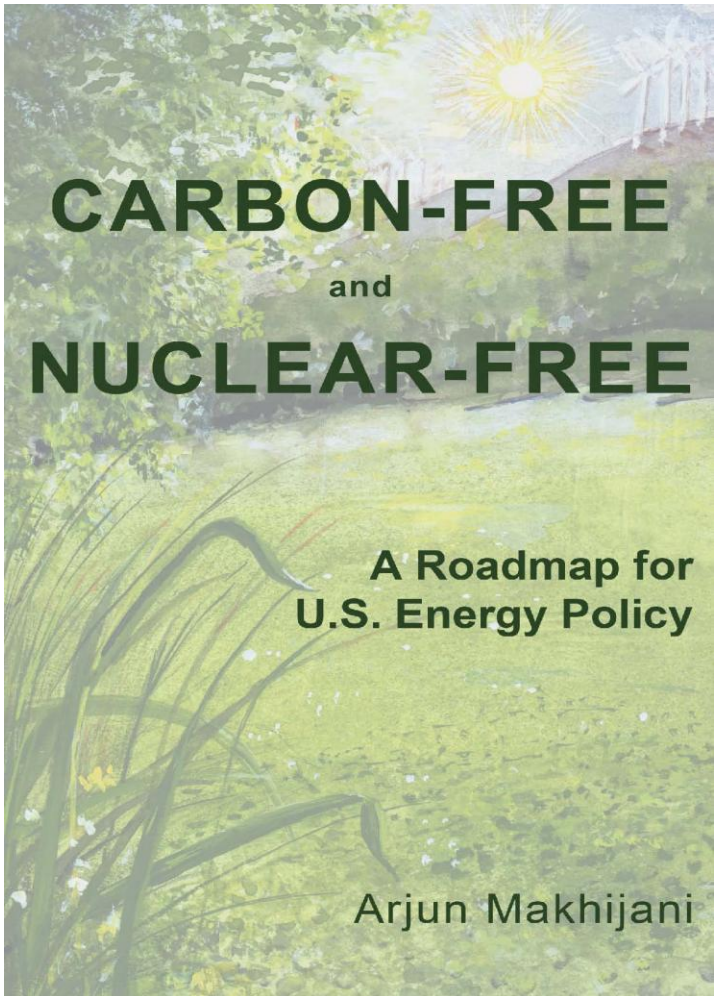
Where to from here? -Timing issues

- **Little time left to pass a climate or energy-only bill this year**
  - Summer recess: August 7 – September 12
- **With elections in November, Fall session will be short; little political will to pass legislatLion**
  - Senate action in "Lame Duck" unlikely
- **New Congress next year: Political will to take up climate change again?**

Do we need nuclear power to address climate change?

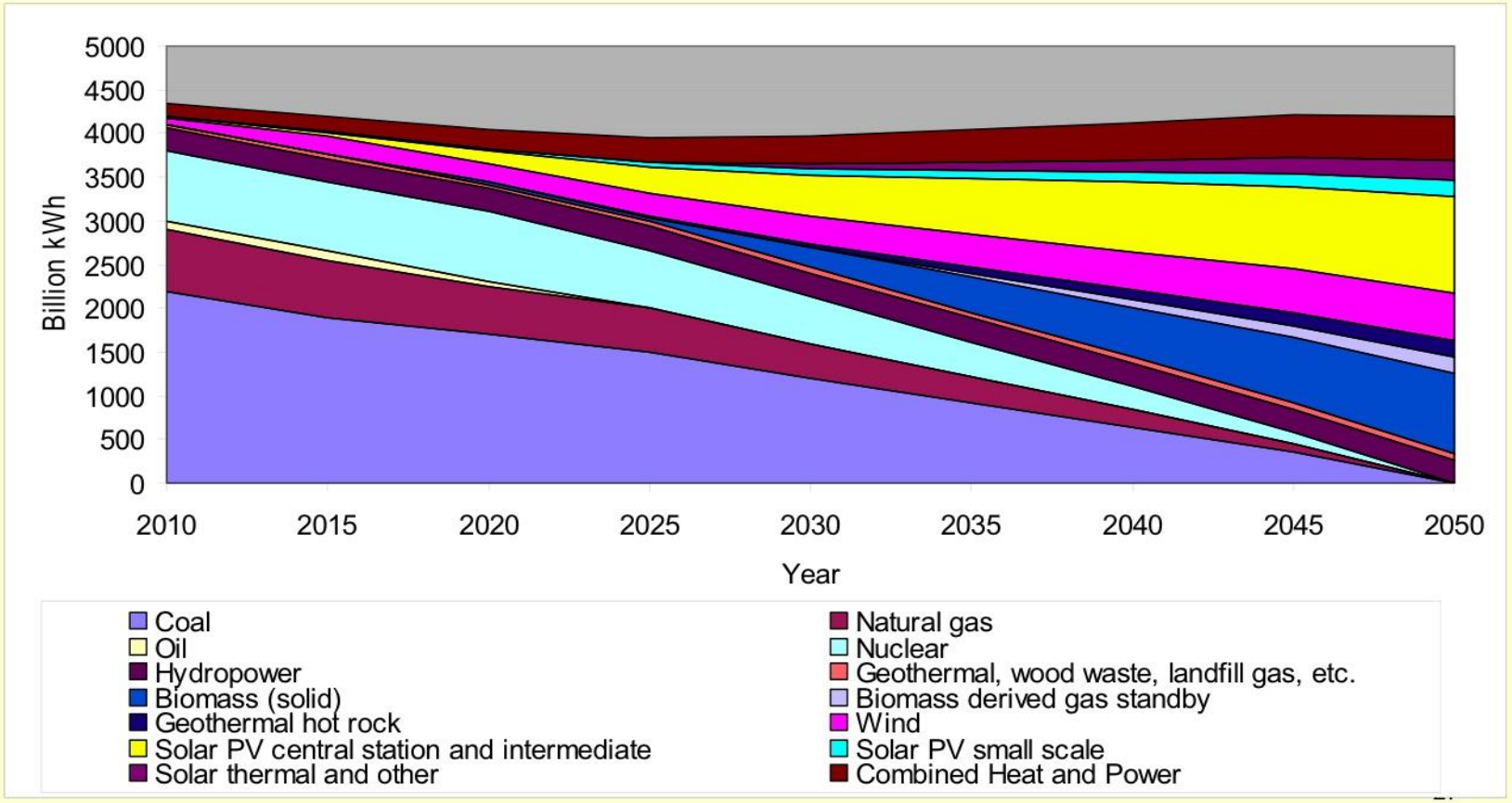
- **No!!** Low-cost, low-carbon technologies are more than ample to meet electricity needs and carbon reductions
- **New reactors will take resources (time, money, attention) away from real solutions**
- **Climate and energy legislation stalled**
  - Dept of Energy unsuccessful in getting more loan guarantee authority

Where to from here?



Institute for Energy and Environmental Research

Electricity production



Source: ***Carbon-Free and Nuclear-Free: A Roadmap for U.S. Energy Policy.*** *AMakijani. 1-18-08*

Challenges ahead for PSR

- Vastly out spent by nuclear industry
- President Obama's support for
  new "safe" nuclear reactors
- Jobs issue:
  short term gain vs long term costs & risks
- Integrating health, economic
  and non-proliferation arguments

PSR® Physicians for Social Responsibility

United States Affiliate of International Physicians for the Prevention of Nuclear War

1985 NOBEL PEACE PRIZE

Dirty, Dangerous and Expensive: The Truth about Nuclear Power

The nuclear industry seeks to revitalize itself by manipulating the public's concerns about global warming and energy insecurity to promote nuclear power as a clean and safe way to curb emissions of greenhouse gases and reduce dependence on foreign energy resources. Despite these claims by industry proponents, a thorough examination of the full life-cycle of nuclear power generation reveals nuclear power to be a dirty, dangerous and expensive form of energy that poses serious risks to human health, national security and U.S. taxpayers.

Nuclear Power is Dirty

Each year, enormous quantities of radioactive waste are created during the nuclear fuel process, including 2,000 metric tons of high-level radioactive waste[1] and 12 million cubic feet of low-level radioactive waste[2] in the U.S. alone. More than 58,000 metric tons of highly radioactive spent fuel already has accumulated at reactor sites around the U.S. for which there currently is no permanent repository. Even without new nuclear production, the inventory of commercial spent fuel in the U.S. already exceeds the 63,000 metric ton statutory capacity of the controversial Yucca Mountain repository, which has yet to receive a license to operate. Even if Yucca Mountain is licensed, the Department of Energy has stated that it would not open before 2017.

Uranium, which must be removed from the ground, is used to fuel nuclear reactors. Uranium mining, which creates serious health and environmental problems, has disproportionately impacted indigenous people because much of the world's uranium is located under indigenous land. Uranium miners experience higher rates of lung cancer, tuberculosis and other respiratory diseases. The production of 1,000 tons of uranium fuel generates approximately 100,000 tons of radioactive tailings and nearly one million gallons of liquid waste containing heavy metals and arsenic in addition to radioactivity.[3] These uranium tailings have contaminated rivers and lakes. A new method of uranium mining, known as in-situ leaching, does not produce tailings but it does threaten contamination of groundwater water supplies.

Serious Safety Concerns

Despite proponents' claims that it is safe, the history of nuclear energy is marked by a number of disasters and near disasters. The 1986 Chernobyl disaster in Ukraine is one of the most frightening examples of the potentially catastrophic consequences of a nuclear accident. An