

# Nuclear Power & California's Clean Energy Future

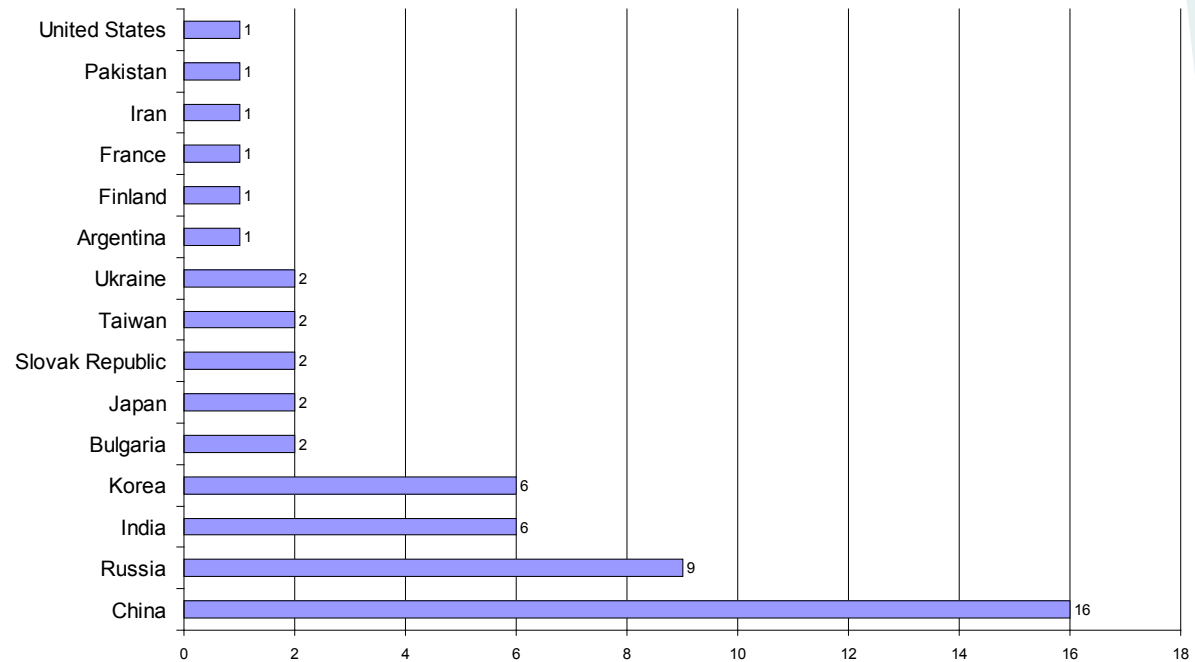
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November 18, 2009

# A Global Nuclear Renaissance

## Reactors Under Construction

- ▶ 53 reactors are in construction across the globe, including one in the United States
- ▶ Worldwide, over 130 reactors presently planned for a total net capacity of almost 150 GW, and there are early proposals for over 250 additional reactors
- ▶ In the United States, there are proposals for over twenty new reactors and applications have been submitted for 17 combined construction and operating licenses



# Making Predictions at Home

- ▶ “There’s no reason why technologically we can’t employ nuclear energy in a safe and effective way. Japan does it and France does it and it doesn’t have greenhouse gas emissions, so it would be stupid for us not to do that in a much more effective way.” – President Barack Obama, October 15, 2009
- ▶ “Restarting the nuclear power industry is very important in our overall plan to reduce carbon emissions in this country. From me you are not going to get any reluctance. As you may know, I think that nuclear power is going to be a very important factor to getting us to a low-carbon future.” – Steven Chu, Secretary of Energy, July 7, 2009
- ▶ “My message to you is a simple one: nuclear energy is part of the solution. I say ‘part’ because there is no one single solution to America’s energy needs. I will keep arguing that nuclear power has a vital place in that mix, and that it deserves our government’s support.” – Steny Hoyer (D-Md.), House Majority Leader, May 20, 2009
- ▶ According to an October 26, 2009 report in the *Chicago Policy Examiner*, the Environmental Protection Agency’s analysis of pending climate change legislation predicts construction of 180 new nuclear power reactors by 2050, more than doubling the currently operating 104 reactors in 31 states, which provide 20% of the nation’s electric power.



# California Clean Energy Mandates

- ▶ Established in 2002 and accelerated in 2006, the California RPS obligates California utilities to procure twenty percent of California's electricity from eligible renewable sources by 2010
- ▶ California AB 32 - GHGs must be reduced to 1990 levels by 2020
- ▶ Policy Goal: 80% below 1990 levels by 2050
- ▶ Nathan Lewis, a chemistry professor at California Institute of Technology, predicted at the Revelle Symposium (March 6, 2009) that:

“[i]f we want to hold CO<sub>2</sub> even . . . even with aggressive energy efficiency we will need as much clean, carbon-free energy... as the entire oil, natural gas, coal and nuclear industries today combined—10 to 15 terawatts. . . . So let's look at carbon-neutral energy sources. We could go **nuclear, which is the only proven technology that we have that could scale to these numbers.** We have about 400 nuclear power plants in the world today. To get the 10 terawatts we need to stay on the 'business-as-usual' curve, we'd need 10,000 of our current one-gigawatt reactors, and that means **we'd have to build one every other day somewhere in the world for the next 50 straight years.**”

# How Tough Will This Be?

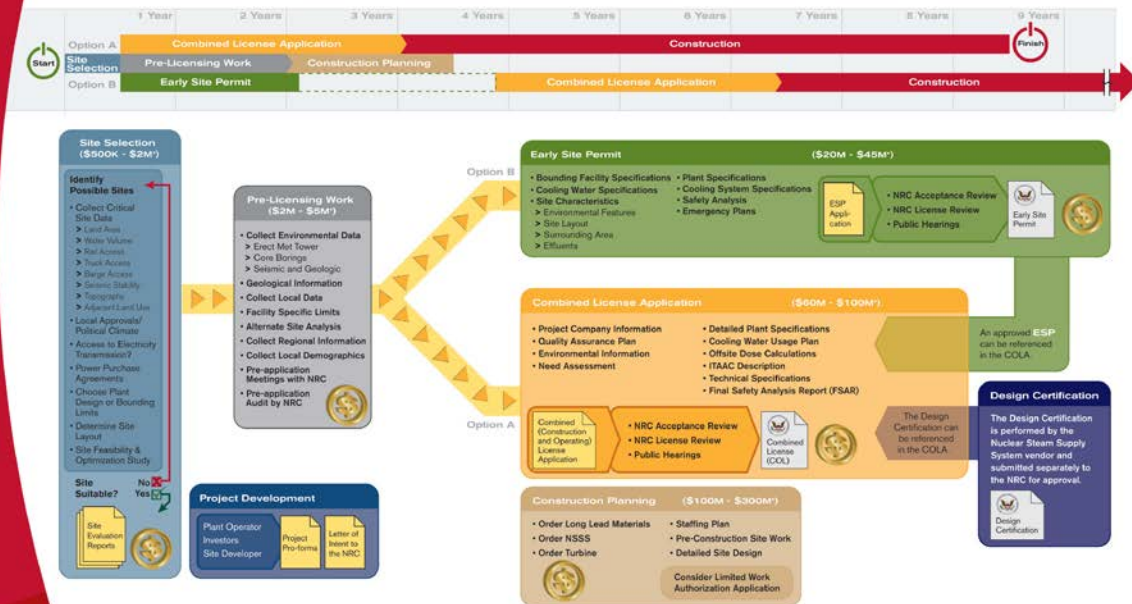
Year	US Population	Per Capita Emissions	GDP	Total Emissions
2050	420 Million (projected)	2.4 Tons (to meet target)	?	1 Billion Tons (BT)
2005 (Base)	303 Million	20.3 Tons	\$ 14 Trillion	6 BT
1910	92 Million	10.9 Tons	\$ 572 Billion	1 BT
1887	45 Million	2.4 Tons	\$ 147 Billion	

# Consequences of the Status Quo

- ▶ California is not in the running for any Federal incentives under the 2005 Energy Policy Act, and the window of opportunity has effectively closed for California's participation in existing programs
  - ▶ Tax Credits
  - ▶ Loan Guarantees
  - ▶ Regulatory Risk Insurance
- ▶ California may well decide that the 1976 moratorium on nuclear power development should stay in place because nuclear power as a concept is not an acceptable solution to the state's power needs, but with high fiscal and energy policy stakes, Californians cannot afford to forestall thoughtful discussion solely because of a statute that is more than 3 decades old while the rest of the nation and world embarks on a “nuclear renaissance”

# No Time to Spare

## New Plant Project Development and Licensing Process



This symbol indicates a stopping point where the project value can be transferred or retained as an asset.

The cost values shown are estimates only. Actual costs will vary by project.



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