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Nuclear Power Generation and the Roadblocks to Carbon Control

Power companies first began building nuclear power plants in the early 1960's, and by 2006 103 nuclear reactors accounted for 20% of US power consumption. However, because of the issues of economic viability, safety, security, waste disposal, and weapons proliferation no new nuclear power plant has been ordered in the US since 1978.

In recent years interest in nuclear power has increased due to concerns over global climate change and the need for carbon-free energy. The Carbon Mitigation Initiative has developed the "Wedges" proposal to stabilize carbon emissions worldwide by creating stabilization wedges that would cut out 1 billion tons of CO_2 per year by 2055. To satisfy one wedge nuclear power would have to provide 700GW, or twice the current capacity, requiring approximately 500 new reactors by 2055. Unfortunately, only 24 new reactors are planned to be built in the next 5 years. A carbon tax of $100 per ton of carbon emissions has been proposed to make nuclear reactors economically viable.

Still, the Three Mile Island incident in 1979 and the Chernobyl accident in 1986 have deteriorated the public image of the safety of nuclear reactors, and current statistics have shown that there is a .0001% risk of a major accident every year, but new procedures and better equipment are being developed. As nuclear power production becomes more widespread security from terrorist attacks on reactors declines and the opportunities for nuclear weapons proliferation increases. Evacuation plans have been developed to address terrorist attacks, but they are widely considered impractical. The Nuclear Non-Proliferation Treaty was signed to provide non-weapons states civilian

nuclear power assistance in exchange for an agreement not to develop nuclear weapons. This agreement has fallen through and the development of weapons has been sought by India, Israel, Pakistan, North Korea, and Iran. Questions of how to deal with nuclear waste still remain and proposals to store nuclear waste in Yucca Mountain would only last until the site fills in 2010. These concerns and unanswered questions create a large roadblock for the development of nuclear power to reduce carbon emissions and tackle global climate change.