



Testimony of Jim Rubens for the Union of Concerned Scientists  
Before the Energy Planning Advisory Board Stakeholder Forum  
Legislative Office Building, Room 304, Concord, June 23, 2006, 9 AM

## **I. UCS Background**

The Union of Concerned Scientists (UCS) is an independent, science-based, nonprofit alliance of more than 100,000 concerned citizens and scientists, including more than 1,000 in New Hampshire, working for a healthy environment and a safer world. For more than two decades, UCS has combined rigorous analysis with committed advocacy to reduce the environmental impacts and risks of energy production and use. Our Clean Energy Program focuses on encouraging the development of clean and renewable energy resources, such as solar, wind, geothermal, and bioenergy, and on improving energy efficiency.

## **II. Problem Statement**

**General Economy.** Fossil-based energy and imported air pollution impose un-quantified costs on New Hampshire's economy, including: lost worker productivity, higher costs for gasoline and vehicle inspection, job losses and trade deficits due to energy imports, and higher risk premiums due to energy price volatility. Global warming can lead to faster rise in sea levels, mass-scale human population migrations, and more destructive and costly extreme weather events.

**Loss of Domestic Energy Technology Lead.** World energy demand is projected to increase by [50 percent by 2030](#), a massive growth market. Europe and Asia have adopted policies to vigorously promote a clean, high-tech energy infrastructure. The continuing pro-fossil tilt to U.S. energy policy risks our forfeiture of technology leadership and the attendant jobs and growth benefits.

**Climate Change.** [Climate scientists have reached overwhelming agreement](#) that fossil-fuel combustion is the major cause of global warming. The ski industry contributes \$650 million each year to our state's economy and requires natural snow and cold weather to prosper. [Since 1970, the northeast U.S. has seen a 4.5 degree F increase in winter temperatures](#). Over the past 50 years, mean annual snowfall in Keene is down by 23 inches, in Berlin by 17 inches. Except at the northern tip of the state, days of natural snow cover have decreased by 5-30 days. Extreme precipitation events are increasing. Climate change already appears to be harming tourism, our second largest industry, and impacting Room & Meals Tax revenue, New Hampshire state government's second largest revenue source. Climate change is already causing northward pathogen migration into New Hampshire.

**Health Impacts.** Two of ten New Hampshire counties (Hillsborough and Rockingham) are ranked "F" for air quality by the [American Lung Association](#). At least 92 percent of New Hampshire ozone and particulate air pollution blows in from sources outside the state, most from fossil-fueled power plants. [Health-related costs](#) to New Hampshire from air pollution from out-of-state sources are estimated to exceed \$1 billion per year. The largest costs include premature death, asthma and chronic bronchitis. In New Hampshire, nearly 1,000 life-years are lost each year due to power-plant fine particle emissions.<sup>1</sup> NH suffers the [highest rate of adult asthma](#) in the nation.

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<sup>1</sup> ABT Associates, "The Particulate-Related Health Benefits of Reducing Power Plant Emissions," Exhibit 6-8 PM-Related Adverse Health Effects by State: All Power Plant scenario, October, 2000, <http://www.abtassociates.com/reports/particulate-related.pdf>. NH fine particulate-related premature deaths, 67 per year. U.S. EPA, OAR, "Final Report to Congress on Benefits and Costs of the Clean Air Act, 1970 to 1990", EPA 410-R-97-002 (October 1997) at I-23. The average number of life-years lost by individuals dying prematurely from exposure to particulate matter is 14 years.

Controlling pollution from power plants is cost-effective, returning over \$12 of health-related benefits for every \$1 spent on emission controls, according to EPA cost-benefit calculations provided with the President's proposed Clear Skies Act.

**Forest Effects.** Fossil generation and vehicle exhaust [reduce New Hampshire forest productivity](#) by as much as 14 percent, due to Nitrogen Oxides, ground-level ozone and continuing harmful levels of acid rain.

**No Action Means a Default Policy Tilt To Excessive Fossil Fuel Dependence.** The private market cannot overcome the existing \$250 billion annual subsidies and uncompensated externalities for the fossil industry. Only hard caps on greenhouse gas emissions, requirements for renewable electricity generation, and a credits trading system for both will create a viable, long-term market for clean, high-technology, renewable sources.

**Voluntary System Did Not Solve Acid Rain.** This 1980s problem was not solved using command and control regulation or voluntary compliance. In 1990, a cap and trade system was implemented, reducing acid-rain-forming power plant emissions by about 50 percent at a cost on-quarter that initially projected by the EPA.

### **III. Strong Public Support for Action**

A Gallup Poll taken March 13-15, 2006 finds:

- 58 percent of Americans think global warming effects have already begun.
- 58 percent think that the effects are caused primarily by human activity.
- 75 percent favor "mandatory controls on greenhouse gas emissions," with 23 percent opposed, a 3 to 1 margin for support.

A Zogby International Poll taken on June 19, 2002 among those who voted for President Bush found a 67 to 23 percent support greenhouse gas controls.

### **IV. Suggested Action**

#### **A. Renewable Portfolio (Electricity) Standard (RPS)**

New Hampshire should join the 21 other states, including Connecticut, Maine, Massachusetts, and Rhode Island, in adopting a strong and effective renewable portfolio (electricity) standard (RPS) to tap into the wealth of homegrown resources in the state, and reap the many benefits that clean energy provides.

A New Hampshire RPS would help reduce the severe U.S. trade imbalance, bring high-paying jobs to New Hampshire, including our north country, reduce dependence on gas from unstable regions, reduce air pollution and global warming emissions, improve public health and leverage New Hampshire's existing strengths in technology.

New Hampshire has an abundant, underutilized resource in low grade timber. Northeast Utilities has already converted one of its Portsmouth, NH generating stations from coal-fired to wood chips. This is projected to bring \$20 million into the regional economy.

GT Solar Technologies, Merrimack, New Hampshire, is the global leader in solar PV production line equipment with 60% market share and \$60 million in annual sales. Foreign demand has resulted in explosive growth at GT. Ominously, only 25% of GT's sales are to US customers.

New Hampshire enjoys at least 2,800 MW of wind-power potential. Several wind farms are being proposed at locations around New Hampshire, but siting should be conducted through an open stakeholder process subject to all pertinent regulations, and with sensitivity to the value of New Hampshire's landscape.

While a full economic analysis of a NH RPS is not available, there have been more than two dozen studies completed on RPS policies in other states. The Department of Energy's Lawrence Berkeley National Laboratory has reviewed these studies and found that state-level RPS costs are projected to be relatively modest.<sup>2</sup> In addition, when accounting for the effect that increased renewable energy generation can have on stabilizing and reducing natural gas prices, an RPS policies can even result in total energy bill saving for consumers.<sup>3</sup>

UCS used a simplified model developed by the U.S. Department of Energy's Lawrence Berkeley National Laboratory to evaluate the potential energy cost impact of SB-314, considered in the 2006 session, finding that the bill in its last amended form (as drafted by Joanne Morin of DES), would modestly reduce energy costs because new renewables development would displace demand for high-cost natural gas.

The testimony of UCS energy analyst Jeff Deyette for SB-314 is attached. Also attached is a UCS report on that status of state-level RPS around the nation.

## **B. Regional Greenhouse Gas Initiative (RGGI)**

New Hampshire should adopt legislation implementing the RGGI model rule now being refined at DES, tailoring adoption to meet New Hampshire circumstances and maximizing potential economic benefit to our state while achieving the emission reduction targets. Generally, the economic, health and other benefits of a NH RPS noted above would accrue if New Hampshire joined the region's states in RGGI adoption.

UCS recommends that New Hampshire's RGGI implementation include significant incentives by means of allowances for direct investment in energy efficiency and renewable energy. Granting all or most allowances to present emitters would foreclose this opportunity to use RGGI to spur efficiency and renewable energy investments which can reduce business and residential consumer energy costs. Even now, New Hampshire and New England are capturing only a small fraction of economically-justifiable energy efficiency cost savings.

The induced technology changes driven by a properly implemented RGGI are not captured in the models that predict RGGI-driven energy cost increases of five percent or more. UCS encourages New Hampshire policymakers to identify and use predictive models that capture the cost-mitigating benefits of RGGI-induced technology change. As an instructive example, initial modeling greatly over-estimated the actual cost of compliance with the Acid Rain program, which now costs between \$1 to \$2 billion per year nationwide -- one-quarter of original estimates. Acid Rain program benefits now exceed \$70 billion dollars annually.

As the architecture of RGGI comes to completion, state agency heads can ensure that RGGI includes incentives that capture that potential and simultaneously lower the costs of the program for consumers. By allocating funding to improve energy efficiency, rather than letting the generators pass the costs onto the consumer, the cost of the program will decrease by reducing energy consumption. This incentive to invest in greater energy efficiency will offset forecasted load growth and also help to stimulate and identify options previously overlooked.

Attached is a UCS brief on potential energy efficiency investment benefits and the need for RGGI modeling which incorporates induced technology change effects.

UCS experts worked with state officials on the development of RGGI. A UCS overview of RGGI is here: [http://www.ucsusa.org/global\\_warming/solutions/regional-greenhouse-gas-initiative.html](http://www.ucsusa.org/global_warming/solutions/regional-greenhouse-gas-initiative.html). Fully detailed information about RGGI is here: <http://www.rggi.org>.

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<sup>2</sup> Chen, C., R. Wiser, and M. Bolinger. "Is it Worth it? A Comparative Analysis of Cost-Benefit Projections for State Renewables Portfolio Standards," Lawrence Berkeley National Laboratory. POWER-GEN Renewable Energy Conference, April 12, 2006.

<sup>3</sup> Wiser, R., M. Bolinger, and M. St. Clair. "Easing the Natural Gas Crisis: Reducing Natural Gas Prices through Increased Deployment of Renewable Energy and Energy Efficiency," Lawrence Berkeley National Laboratory. January 2005. Download at <http://eetd.lbl.gov/EA/EMP/reports/56756.pdf>

### **C. New Hampshire State Investment Policy**

UCS recommends that the New Hampshire State Treasurer join his counterparts in Maine, Connecticut, Vermont, Maryland, New Mexico, California and Oregon in the Investor Network on Climate Risk (INCR) for the purpose of assessing risks of climate change to New Hampshire's state investment portfolios. The INCR is most focused on passing resolutions and gaining agreement from management to conduct company-wide risk assessment of global climate change to company assets and operations.

A brief INCR backgrounder on investor climate change risk is here:

<http://incr.com/index.php?page=9>.

A summary of 2005 INCR coordinated activity is summarized here:

[http://www.ceres.org/investorprograms/shareholder\\_action.php](http://www.ceres.org/investorprograms/shareholder_action.php).

## UCS Testimony for SB-314

Mr. Chairman and Members of the committee: Thank you for the opportunity to appear before you. My name is Jeff Deyette, and I am an energy analyst with the Union of Concerned Scientists. UCS is a nonprofit organization of 70,000 citizens and scientists—including more than 1,000 members here in New Hampshire—working for practical environmental solutions. For decades, UCS has combined rigorous analysis with advocacy to reduce the environmental impacts and risks of energy production and use. We have been a leading analyst of and advocate for renewable energy portfolio standards, playing an active role in discussions of RPS adoption and implementation before legislatures and commissions at the state and federal level.

The RPS has proven to be an effective and affordable policy for stimulating renewable energy development. New Hampshire should adopt an RPS to tap into the wealth of homegrown resources here, and reap the many benefits that clean energy provides. Renewable energy reduces the air pollution caused by burning coal, oil and natural gas to make electricity, and can help prevent the potentially severe consequences from global warming. It reduces our growing dependence on importing natural gas from unstable and unfriendly countries, and creates new revenues and jobs right here in New Hampshire. It can also help stabilize and reduce volatile energy prices. It is on this last point that I will focus my comments.

During their deliberations, the greatest concern of Senators was that the RPS not create any additional undue economic burden on consumers. As a result, the Senate voted in favor of a version of SB 314, which while establishing a target of 11.8 percent renewable energy by 2013, also 'zeros out' the RPS' alternative compliance payment renewable energy certificates prices, effectively creating a voluntary goal.

In the fiscal note for SB 314 (as it was drafted on February 2, 2005), the Public Utility Commission calculated the cost impact using a simple formula based on the maximum price for purchasing RECs via the alternative compliance payment provision. Under this worst case scenario, the PUC found that the RPS could cost consumers as much as 0.15 cents per kilowatt-hour in 2007, or about 95 cents per month for the typical residential consumer.

The concern for electric customers is legitimate, though extensive consumer research indicates that such an increase is well within the range of what the majority of consumers are willing to pay an extra amount for clean, renewable electricity.<sup>4</sup> However, there is good reason to believe that the RPS will have a more modest effect on consumer costs than what the PUC projected, even potentially reducing energy bills in the long run.

For example, the PUC analysis does not take into account the effect that the RPS could have on natural gas consumption and prices. Several recent studies by the U.S. Department of Energy, UCS, and others have demonstrated that the increased use of renewable energy creates competition with natural gas power plants, which reduces natural gas demand and thus puts downward pressure on prices. A reduction in natural gas prices leads to lower electricity costs as well as lower costs for those homes and businesses that use natural gas for heating.

The Lawrence Berkeley National Laboratory evaluated this gas price hedging effect of renewable energy deployment, and developed a simple tool that can be used to evaluate the impact of renewable energy on gas prices without having to rely on a complex national energy model. Applying this tool to SB 314, we find that the increased use of renewable energy could result in average electric rate savings ranging from \$0.1 to \$0.3 per megawatt-hour from 2007 to 2020. This is equal to statewide cumulative discounted electricity bill savings ranging from \$344,000 to \$860,000 through 2020. These are modest, but important savings that would increase should we experience gas price volatility similar to what we've seen in recent years. And as a result of the regional nature of the New England power market, when the development stimulated by SB 314 is

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<sup>4</sup> Consumer research also shows that consumers strongly prefer to have a program, such as a renewable electricity standard, where everyone pays to add renewable energy to the mix, rather than rely on voluntary programs alone. Wisser, R. "Using Contingent Valuation to Explore Willingness to Pay for Renewable Energy: A Comparison of Collective and Voluntary Payment Vehicles," Lawrence Berkeley National Laboratory, August 2003.

combined with the renewable energy supported by other state RPS policies in New England (CT, MA, and RI), the effects are far greater—average electric rate savings range from \$1.3 to \$3.1 per MWh through 2020, and cumulative discounted electricity bill savings range from \$82 million to \$206 million through 2020. New Hampshire gas customers are already going to experience some of these savings thanks to the other state RPS policies. SB 314 would add to these benefits.

In addition to the gas price reduction effect of renewable energy, experience with the Massachusetts RPS demonstrates that longer-term contracts for RECs can greatly reduce REC prices below the level of current spot market prices or the maximum level set by the alternative compliance payment provision.

Massachusetts electric utility distribution companies have relied significantly on the ACP for RPS compliance starting in the 2004 compliance year. This means that Massachusetts consumers are currently paying the highest possible price for RPS compliance. In response, the Massachusetts Technology Collaborative, as the administrator of the state's Renewable Energy Trust fund, has developed a program, called the Massachusetts Green Power Partnership (MGPP), to create contractual mechanisms that provide long-term purchase agreements for RECs. MTC staff have concluded that relative to near-term market prices, long-term purchase deals for RECs are considerably less expensive. Using a competitive solicitation, the MGPP received bids from renewable energy project developers for 10-year REC contracts at prices averaging approximately \$25 per MWh. Compared with the current REC prices of around \$50 per MWh, it is apparent that significant savings are available through long-term REC contracts.

Long-term contracts for electricity, or for bundled electricity and RECs, can deliver even greater savings relative to the PUC calculation. A Berkshires wind project has sold long-term contracts for electricity and RECs for a total price of 7.8 cents per kWh. The current wholesale spot market price is 6.3 cents per kWh. However, the average wholesale market price of electricity in New England for 2005 was 8.1 cents per kWh, with the October market price averaging over 11 cents per kWh. Therefore, this project would have saved New Hampshire residential electric consumers as much as \$2.30 per month in 2005. Its stable price will continue to provide valuable protection for consumers against the risk of price volatility for years to come.

Harnessing renewable energy to provide electricity has broad public support. It provides an opportunity to help leave future generations a legacy of cleaner air, cleaner water, a stable climate, and greater energy independence at little or no cost to ratepayers. I urge the committee members to restore the alternative compliance payment REC prices back to their original levels; thereby creating an effective and affordable renewable energy policy. Thank you.