



GLOBAL WARMING IN VERMONT

Warning Signs, Winning Solutions



WHAT VERMONT WILL WE PASS ON TO FUTURE

Clean air, clean water and a vibrant working landscape are essential to our strong economy and high quality of life across the Green Mountain state. But Vermont's economy and natural environment are under serious threat from global warming. Signs of global warming show that we need to act now. Vermonters want policies that protect our environment and traditional way of life. Effective solutions – from wind power to cleaner cars – will fend off global warming. Vermonters are taking individual steps to use less oil, gas and electricity but we need our leaders to do more to protect the Vermont we love for the future.

WILL WE PASS ON —

- Warmer winters, hotter summers, slush and humidity?
- Smog-filled valleys and more asthma?
- Dull fall foliage?
- Dangerous diseases: West Nile Virus, EEE, and Lyme Disease?
- A faltering tourism economy?
- Three months of mud season?
- No sugar shacks or maple sugar related industry?

GENERATIONS?

OR —

- Clean, affordable and locally generated power?
- Clean, fuel-efficient cars that prevent air pollution?
- A thriving traditional economy supported by energy efficient technologies developed in Vermont?
- Lower energy bills at home, with efficient insulation, heating, lighting and appliances?
- A beautiful green, red, yellow and orange Vermont with healthy air and clear water?



GLOBAL WARMING: WARNING SIGNS, WINNING SOLUTIONS

Fog rises in valleys filled with farms and small towns between the majestic mountains that line our state on an early morning in Vermont. This is the pristine environment we cherish. Thousands of tourists flock to our spectacular region each season to share for just a short time the state we enjoy all year. Our vibrant communities cultivate strong agricultural business, supply maple products to the world, and build on tradition for future growth and healthy living.

14,000 years ago our planet was 10 F degrees cooler and Vermont was covered with a sheet of ice one mile thick. A similar shift in the other direction of the thermostat could have equally catastrophic consequences for Vermont.

According to the Environmental Protection Agency the climate of Vermont could be like that of Richmond, Virginia, or even Atlanta, Georgia by 2100. As carbon dioxide levels rise, they create a blanket effect that holds in more energy and warms the earth. Gases emitted by our cars, furnaces, and electric generators are warming our planet.

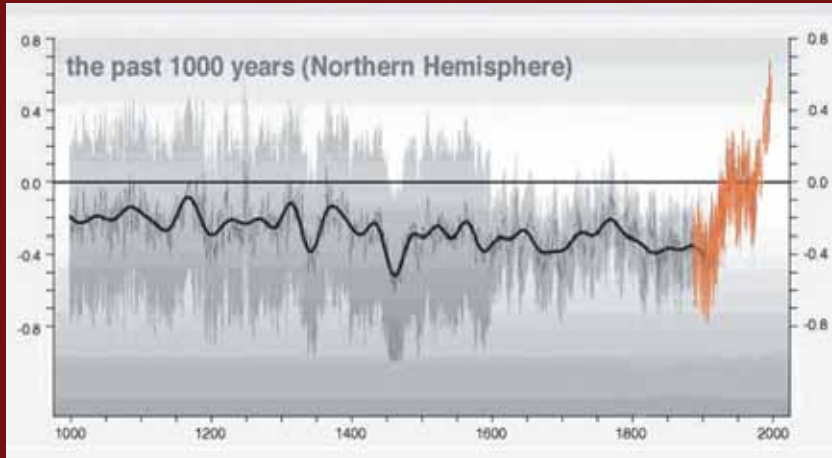
According to the National Oceanic and Atmospheric Administration the Northeast's average annual temperature has increased by 1.8 F since 1899. Over the past 30 years temperatures have increased 1.4 F. Winter temperatures (December to February) show the greatest seasonal rate of warming (2.8 F). In the last 30 years (1970-2000) we have seen a striking increase of 4.4 F in winter temperatures. The 1990's were the warmest decade on record.

Vermont now produces 23% more global warming pollution than we did in 1990. The related smog will cause increased cases of asthma and reduced lung function. Warmer winter temperatures mean fewer days for skiing, skating, snowmobiling and ice fishing. These climactic changes have a huge impact on Vermont's economy, environment and our quality of life.

VERMONT'S INCREASING CONTRIBUTION TO GLOBAL WARMING

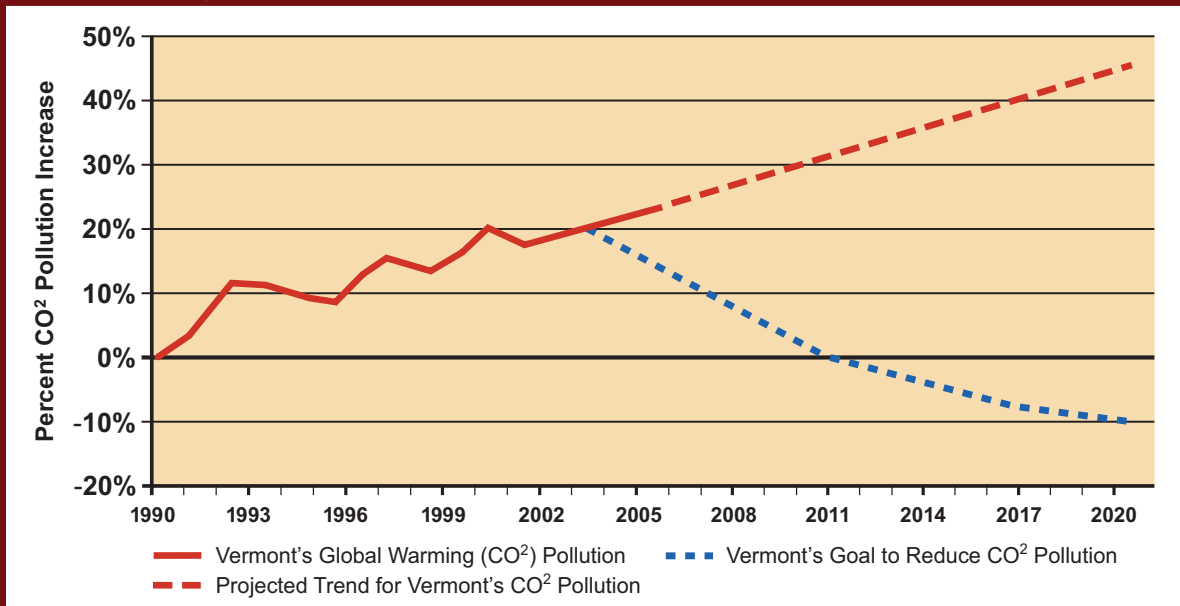


Departures in Temperature in °C (from the 1961-1990 average)



Vermont's global warming pollution is increasing at an alarming rate at the same time that global temperatures are rising rapidly. Immediate steps are needed to stem the increase in emissions. Governor Jim Douglas committed Vermont to meet the pollution reduction goals adopted by New England Governors and Eastern Canadian Premiers in 2001. Vermont is not on track to meet those goals.

Vermont's Projected Pollution



WARNING SIGNS IN VERMONT

Incremental changes over time add up. The natural climate we love in Vermont will be changed if we continue to consume coal, oil, gas, and diesel at the current rate. If we let global warming go unchecked, Vermont could have the same climate as today's Atlanta, Georgia by 2100.

■ Hotter, Smoggier Summers

Smog is increasingly a visible problem in Vermont. Hot and hazy summer days contribute to the formation of smog which decreases lung function and increases childhood asthma rates.

■ Wetter Winters

Snowfall has decreased 15% since the 1950's. Precipitation is projected to increase as much as 30% in winter (mostly in the form of rain). More rain in the winter means a shorter ski season and a longer mud season.

■ Skiing and Snowmobiling

Scientific data shows that winter in Vermont has already shortened by more than two weeks over the last 50 years. Warmer temperatures could erase most winter recreation in Vermont and the money it brings to our economy.

■ Tourism

The autumn fall foliage season is the second most popular time to visit Vermont. Global warming threatens Vermont's colorful maples and the beauty of changing colors on Vermont's hillsides.

■ Maple Sugaring

Conditions are already increasingly favoring sugaring in Canada. Historically Vermont has enjoyed freezing nights and warm days during February and March, perfect for producing maple sugar. Global warming reduces the amount of freeze and thaw cycles and cold recharge periods.



■ Diseases

Ticks would thrive in a warmer Vermont and would increase the spread of Lyme disease. Mosquitoes carrying tropical diseases such as equine encephalitis and West Nile Virus would also increase in a hot and humid Vermont.

WARNING SIGNS AROUND THE WORLD

Signs of global warming such as melting glaciers and the increased intensity of tropical storms and hurricanes are emerging around the world. The impacts are becoming serious and people, businesses, and nations are responding. The United States Government, however, has failed to show the leadership needed to protect our planet from global warming. Now is the time to act.



■ Intense Storms

Hurricanes and storms have been intensifying, taking lives and causing billions of dollars in damage. One day a storm in Bombay dropped 37 inches of rain killing over 1,000 people. Along the US Gulf coast hurricane Katrina killed over 1,000 people and wreaked damage worth an estimated \$200 billion.

■ Heat Waves

Europe faced its most serious heat wave in 500 years during the summer of 2003. More than 19,000 people died.

■ Shrinking Glaciers

Glaciers around the world are melting. A 50% size reduction has already occurred in the European Alps, Mt. Kenya, Mt. Kilimanjaro, and Alaska.

■ Species Extinction

Scientists predict that more than 1,000,000 species of plants and animals may become extinct in the next 50 years as a result of global warming.

■ Flooded Coastlines

Governments and entire populations of people will be forced to evacuate homes, villages and cities as sea levels continue to rise.

■ Abrupt Climate Change

Scientific evidence shows that atmospheric pollution increases the likelihood of sudden and drastic climate fluctuations. Widespread drought and overheated regions are likely, as are areas of deep freeze.



WARNING SIGNS

■ Smog and Asthma

When my daughter, Andrea, has a severe asthma attack, I try to stay calm but inwardly I am paralyzed with fear. Once she told me “I’m gonna die, if I don’t get any air.” I feared she might not survive. As a professional, I can distance myself but when it’s your own child, it is a different story. Although her asthma is now well managed, I still worry. Climate change is causing temperatures to rise – even in Vermont. Warmer temperatures lead to increased emissions and dirty air. This fall several schools postponed sporting events when air pollution exceeded safe levels. Unfortunately, unless things change, there will be many more days when children like Andrea cannot participate in outdoor activities.



Andrea Cohen

According to the American Lung Association of Vermont, an estimated 11,000 children in this state have asthma. We need to protect the air in which these children and others live, play and breathe.

— **Laura Cohen**, *Mother and Critical Care Nurse*



■ More Insect Borne Disease



Rev. Claire North started a Lyme disease support group when she realized that she was just one of a growing number of Vermonters affected by the tick-borne disease. "Extended periods of warm weather allow the ticks to live longer, and create a bigger window for them to spread tick-borne illnesses like Lyme, erlichiosis, babesiosis, and bartonella. I think it has been a big mistake to wait until global warming has become so obvious. I want the government to act now before things spin any further out of control. If we fail as good stewards and the planet gets sick, so do we."

— **Rev. Claire North**



Rev. Claire North



■ Winter

"Vermont winters are already changing and we will continue to see a higher incidence of heavy wet snows and ice storms that will increase the likelihood of more power outages with each winter storm. An increase in the freeze-thaw cycle will confuse and damage existing eco-systems of lakes, ponds and rivers. Eventually snow may be confined to the highest tops of the mountains making winter recreation a thing of the past.

Winter storms will become stronger, but more and more erratic, producing high winds with nearly every storm system."



■ Spring

"Mud season will not be confined to spring, but occur frequently through winter costing more money to maintain town roads and infrastructure. Higher global temperatures also mean more water vapor, eventually wiping out the conditions needed for maple sugaring. Thunderstorm frequency will likely go up, bringing earlier threats of severe weather."

■ Summer

"An increase in humidity with a higher incidence of thunderstorm activity can often mean more frequent flooding. Thunderstorms often include wind damage and even the incidence of 'Tornadic Thunderstorms' will rise.

Erratic weather can also mean long stretches of dry weather or droughts which can lead to forest fire hazards."



■ Fall

"Fall colors may become much duller over time. Frosts associated with late September and October will be moved back into November and toward the holiday season in future years."

Weather expert and WDEV meteorologist Roger Hill sees a warmer climate having a serious impact on Vermont's future.

■ Lost Maple Sugaring

John Courtemanche: "I've been a sugar-maker all my life, 44 years, since I was a child. In my recollection the production just depends on the season, but the climate is moving north. As a kid I remember gathering buckets with deep snow still on the ground in the 1960's



and 1970's. You could count on it every year. This year there was no snow in early February, but a lot of frost.

I'm also a snow-mobiler. This year ('05) I didn't take the sleds out of the shed though. There was no snow until late March. I know the trail maintainers lost a lot of money. People don't buy passes when they are not getting the bang for the buck they normally do.

It's like Connecticut weather – not good, with a lot of smog in the summer and less snow in the winter. Being a native it really effects us – everybody. It's tough because a lot of people feel the same way. This year when I went to harvest we had 1-2 inches of snow. We normally have 6-8. Things are changing and it's hard to predict what will happen in the future and how to prepare for it."

NUCLEAR POWER: NOT A SOLUTION

Vermont's nuclear power plant was designed to last 40 years and be retired in 2012. Entergy, the plant's owners would like to:

- *Continue to store increasing amounts of high-level nuclear waste in Vermont.*
- *Run the aging plant at 120% of its designed capacity.*
- *Extend the plant's operating license 20 years beyond its retirement age.*



Would you put your children on a 40 year old school bus that has had serious mechanical problems, allow the bus driver to exceed 80 MPH, and trust that it will be a safe trip for another 20 years?

■ Nuclear Power is Not CO₂ Free

Mining fuel for a nuclear power plant takes a lot of energy. When you consider all of the energy required to construct, fuel, run and dismantle a nuclear plant, the process can create more global warming pollution than an equivalent natural gas power plant. In comparison, a wind turbine only needs to run for 3-6 months before it starts producing pollution-free energy.

■ Nuclear Waste

Nuclear power production creates tons of spent radioactive fuel, which remains a deadly toxic threat to the environment and the public for tens of thousands of years. No safe method of permanent storage has been developed despite billions of dollars of research over the past four decades. The waste could be used to make a “dirty bomb” if it ever got into the wrong hands.

■ Safety Problems

In just the past two years the Vermont Yankee plant has experienced: misplaced fuel rods, a transformer fire, cracks in the steam dryers, higher than legal radiation levels at its fence line and an “inoperable” cooling system, a primary system that would be used to cool the reactor core in the event of an emergency.

■ Expensive Power

U.S. taxpayers have given the nuclear industry over \$100 billion dollars in subsidies. Without these subsidies, the nuclear industry likely would not have survived as long as it has.



WINNING SOLUTIONS

Global warming is changing Vermont. Human actions have caused these changes and human actions can undo them. There are many ways that we can help stop the damage that is being done to our climate. In Vermont we need leadership at the state and local levels as well as individual action.

■ Global Warming Plan

A comprehensive statewide plan on how to most effectively address global warming is a must. The plan should set clear goals to reduce Vermont's emissions to levels that will not change our climate and involve government, the private sector and the public in making those goals a reality.

■ Efficient Appliances

State efficiency standards for appliances that are not covered by federal standards would save Vermonters money and reduce pollution.

■ Energy Efficient Buildings

New building codes and weatherization incentives would produce more efficient buildings. Home and business owners should check for good insulation and airtight windows to keep buildings warm.

■ Smarter Transportation

Rebates for more fuel-efficient vehicles and smart transportation and community planning will reduce global warming.

■ Renewable Energy

Wind, small hydro-dams, solar and biomass (cowpower, woodchips, landfill gas) are renewable energy sources that can provide local clean power. Vermont should work to get 80% of its electricity from renewable energy by 2025.

■ State Leadership

Ask your state legislators to pass laws adopting the measures above and require that all state agencies consider global warming whenever they spend taxpayer dollars.

■ Federal Action

Demand federal legislation for global warming pollution reduction with efficient cars and clean renewable energy.



■ Driving for Change



Andrew Perchlik is worried about global warming in Vermont. He realizes that there will be increasingly negative impacts to our economy as well as environment if we don't act now.

Knowing that over half of Vermont's contribution to global warming coming from cars and trucks he considered how he could cut down on the car exhaust his family creates. "We try to limit our trips to town by doing a lot of errands all at once, and I primarily work out of the house. In Vermont, so many people like us live in rural areas where buying a car with better gas mileage makes a big difference."

"The Toyota Prius is comfortable, does fine in the snow and it gets up to 52 miles per gallon. And now that gas prices are so high that has saved us a lot of money."

"Obviously automobiles are a major source of pollution and affect global warming. Driving the hybrid is a small way we are doing our part. I would like to see our government make it easier for folks to buy efficient cars instead of SUV's and support cleaner fuels like bio-diesel. We need to do everything we can now to decrease our global warming pollution," says Andrew.



Marianne Perchlik with her daughters Maple (l) and Mary (r)



■ Clean Energy

Martha Staskus says her priorities are clear, “My kids and family are the most important things to me.” That’s a big part of why she works on bringing more wind power to Vermont. “Really, it’s about creating the best and healthiest future for our kids.”

Two thirds of our electricity contracts in Vermont are slated to expire within the next 10 years. “Generating clean, renewable power here in Vermont reduces the need to import electricity from fossil fuel-fired plants, and reduces pollutants resulting from burning of those fuels,” says Martha. Half of the electrical power in New England currently comes from fossil fuels. Coal and oil fired power plants are significant sources of global greenhouse gas emissions. These plants also threaten our health and environment with mercury, acid rain and smog.

“We all need to be aware that every day our actions impact our environment. If we leave the light on, there’s a good chance that fossil fuels are being burned to make that possible. It would be better if we were getting our electricity from

renewable resources right here in Vermont. Global climate change is a serious concern and I think that more and more Vermonters realize that we have to do something now to address the issue. Wind power, in tandem with other renewable energy technologies and energy conservation, is part of the solution.”

Martha believes that we all can make a difference, “For our kid’s sake, for our environment and our health, we all need to look at where we can make a difference and then make it happen.”



Wind Farm in Searsburg, Vermont



Martha Staskus and her kids, Mallory (l) and Paul (r)



■ Smart Growth

Melinda Moulton's business card reads "*Not your typical developer.*" Melinda was dismayed by farm land getting paved over with suburban strip malls and big box stores. In creating Burlington's Main Street Landing she and her business partner Lisa Steele have proven that a more environmentally and socially responsible alternative is possible. "We need to make sure that when we are looking at the health of Vermont's economy and environment we are thinking 20 and 50 years out. The Main Street Landing project was designed with the health of our environment and community as top priorities," says Melinda.

To Melinda smart growth means:

- Concentrate development within city growth centers
- Lessen the dependence on the automobile by contributing to and supporting public transportation
- Create mixed-use structures for housing, office, and retail
- Educate the public on the benefits of environmentally sustainable



Melinda Moulton

design/development/
construction

- Demonstrate a model of highly efficient energy use

"Choosing to redevelop and invest in existing downtowns and village centers reduces the number of miles people travel in their cars. When designing Main Street Landing we wanted to make sure that our buildings were built with green materials and strict environmental and social principles. Additionally, we made sure it would be easy for people to get here by



Main Street Landing

rail, bus, bike or on foot. The way that we build our communities in Vermont will affect the character of our state and it will have a profound impact on our contribution to global warming." To learn more about sustainable redevelopment, visit www.mainstreetlanding.com.



■ Energy Efficiency

Rachel Pendleton wouldn't say she's a know it all, but she sure does seem to have answers to a lot of questions.

That's because as the author of Efficiency Vermont's popular 'ask Rachel' column she answers Vermonters' questions about energy use and conservation every week and publishes the answers in a variety of local newspapers. If you have an old refrigerator, a drafty attic, or an unknown electrical use that's sucking your paycheck down the drain, Rachel can help.

"Efficiency is the cheapest, most effective way to stop global warming," says Rachel. "From better light bulbs and windows, to designing a new home to be efficient from the ground up, there are millions of projects large and small out there for Vermonters to take on."

"With electricity prices on the rise and the cost of gas and oil near all-time highs, now is a good time to seriously weatherize your home or business and phase out energy hog appliances. What people seem to be lacking most

often is advice on where to start and choosing which capital investments will save them the most money."

That's where Rachel's column, and Efficiency Vermont's mission overall, comes in. Efficiency Vermont provides information and expert advice to all Vermonters free of charge, as well as rebates and other financial incentives for many energy saving measures. Their work in 2006 is expected to save 58 million kWh of electricity.

"Every dollar we spend on efficiency saves close to two dollars in energy costs," Rachel explains. "With solutions that cost effective, who wouldn't want to invest in energy efficiency?"



Rachel Pendleton Fredericks



Credits

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Editors: **James Moore, Drew Hudson**

Design: **Jill Bock Design**

- Photo and Illustration Credits (*left to right on page*):
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Vermont Public Interest Research Group

141 Main Street, Suite 6

Montpelier, Vermont 05602

Tel: (802) 223-5221 / Fax: (802) 223-6855

www.vpirg.org



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**Vermont Public Interest
Research Group**

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