

Scientific Information Statement: Attachment A

Climate Change

Climate change is a shift in the average weather a given region experiences over a long period of time. There are cycles of global climate change that occur naturally, such as the occurrence of periodic ice ages, etc. However, the scientific consensus is that human activities are causing climate change to occur at an unprecedented rate and to unprecedented levels since the beginning of the industrial revolution, by altering the chemical composition of the atmosphere through the buildup of greenhouse gases (GHGs). An increasing rate of warming has taken place over the last 25 years, and 11 of the 12 warmest years on record have occurred in the past 12 years.¹ The primary source of these emissions is fossil fuel combustion. Undesirable impacts of climate change include shifting temperature averages and extremes, the timing and amount of precipitation, changes in suitable habitat for plant and animal species common to a region, an increase in harmful lower atmospheric ozone levels, an increased frequency of extreme weather events, and the prevalence of vector-borne disease.

Recent estimates by the Intergovernmental Panel on Climate Change (IPCC) predict the Earth will warm between 2 to 11.5 degrees Fahrenheit over the next 100 years.¹ In New England, the potential consequences of climate change are expected to include significant warming, deteriorating air quality through increased ozone, nitrogen oxides (NOx) and sulfur oxides (SOx), a combination of droughts and flooding, changes in the character of forests, and the probable spread of Lyme Disease, toxic algal blooms, etc.² In Vermont, this warming could produce a shorter ski season, allow incursion of warmer climate tree species which would replace the current mix of hardwoods that produce our spectacular fall foliage, and result in a dramatic change in the quality and quantity of maple sap.³

Greenhouse Gas Inventory

Of the human activities that emit GHGs, the combustion of fossil fuels for transportation represents the single largest source in Vermont (approximately 44% of Vermont's gross GHG emissions in 2005).⁴ GHG emissions from electricity generation and use are relatively small at present in Vermont, given that roughly two thirds of Vermont's electricity demands

¹ Intergovernmental Panel on Climate Change, *Climate Change 2007 – Fourth Assessment Report (AR4)*, available at <http://ipcc-wg1.ucar.edu/wg1/wg1-report.html>

² New England Regional Assessment Report, U.S. Global Change Research Program, "The Potential Consequences of Climate Variability and Change" *Foundation Report*, Washington, 2000.

³ U.S. Environmental Protection Agency, *Climate Change and Vermont*, EPA 236-F-98-007aa (Sept. 1998).

⁴ DRAFT Vermont Greenhouse Gas Inventory and Reference Case Projections 1990-2030; May 2007, available at <http://www.vtclimatechange.us/ewebeditpro/items/O123F11877.pdf>

currently are met by hydroelectric (Hydro Quebec) and nuclear (Vermont Yankee) sources.⁵ Since electricity from these sources is not produced through combustion of fossil fuels, there are few associated GHG emissions. During 2005, electricity produced in-state and imported electricity combined accounted for only about 7% of Vermont's gross GHG emissions.⁶

However, Vermont faces a substantial near-term challenge with the impending need to replace the major power source contracts of both Hydro Quebec and Vermont Yankee in the period between 2012 and 2015. According to the Vermont Department of Public Service, many individual Vermont electric utilities face major resource decisions even sooner. Given the low GHG intensity of Vermont's existing electricity mix, it is likely that at least some portion of the future replacement generation will rely more heavily on fossil fuel-fired generation either in-state or within the New England region. Vermont currently does not meet its electricity demand with in-state generation, and therefore must import power from outside its borders. In 2005, electricity generated from fossil fuels and the ISO-NE system accounted for 19% of total purchases.⁷

The GHG inventory, recently prepared for the Governor's Commission on Climate Change effort, quantifies both historical and contemporary GHG emissions, as well as outlines future emissions projections to 2030 that take into account a range of future policy decisions.⁸ These projections demonstrate that Vermont's future GHG emissions from electricity generation and demand have the potential either to remain relatively minor, or increase substantially depending on decisions made now. Vermont's participation in the Regional Greenhouse Gas Initiative (RGGI) is a critical step towards maintaining a reliable electricity supply having a low GHG emissions intensity.

⁵ 2005 Vermont Electric Plan. Vermont Department of Public Service, available at <http://publicservice.vermont.gov/pub/state-plans/state-plan-electric2005.pdf>

⁶ DRAFT Vermont Greenhouse Gas Inventory and Reference Case Projections 1990-2030; May 2007, available at <http://www.vtclimatechange.us/ewebeditpro/items/O123F11877.pdf>

⁷ Id.

⁸ Id.