

## **Climate Change is a moral issue**

**Alan Betts** (<http://alanbetts.com/writings>)

As winter arrives, my Brussels sprouts are still doing well. I've planted more lettuce, spinach, and kale in cold frames to see what will come up in the spring.

For years I have suggested that more snow means colder winters, since snow reflects sunlight. Last Christmas I was given 60 years of data from the Canadian Prairies, and I found the cooling of the climate with snow was even larger than I had expected.

When snow falls on the prairies, the temperature drops by as much as 18 degrees. As a result, the mean temperature of the cold season is directly related to the fraction of days with snow cover. Less snow means warmer winters.

Snow cover acts like a climate switch that shifts the climate to a much colder state. In Vermont the drop of temperature with snow cover may be less than for the Canadian prairies. Here we have much more forest cover, and snow under trees reflects less sunlight.

But there is a second cooling effect that is the same everywhere: Snow on the surface evaporates very slowly. This means that the air in winter contains less water vapor, which is a strong greenhouse gas. Consequently the Earth can cool more at night.



**Fresh snow (16 December 2013)**

This month I have been thinking about how climate change is no longer a scientific or technical issue, but a moral issue. Twenty years ago humanity made the commitment to reduce greenhouse gases from the burning of fossil fuels, but we have not kept this promise. We know what to do — double our energy efficiency and move towards renewable energy as the primary source for our power.

We have done a little. But even in Vermont the protests against wind power and now photovoltaic panels have been growing. People don't like change. Why can't we do things the way we have always done? Please don't make us pay more for the long-term costs of fossil energy.

The Earth is responding with increasing extreme weather, and people are suffering. All we have really done is push the ever-rising costs into the future, where they far exceed anyone's ability to pay for them.

To avoid change now and to save some money now, we are condemning our children, the poor and the Earth to immense suffering later this century. This is clearly unjust and immoral, when we know what we could and should do.

Add to this picture the proposed new gas pipeline south to Middlebury and west to Ticonderoga, N.Y. The ads say it will bring cheaper fossil fuel, because of the current boom in fracking. They also point out that burning natural gas, methane, produces fewer CO<sub>2</sub> emissions than burning oil.

But the ads are silent on the key Earth issues. The fossil fuel we have already extracted has committed us to large changes in the climate. It is time to stop developing new fossil reserves.

Nor do the proponents of the natural gas pipeline mention that most areas have moved ahead on fracking with little regulation — and that every new gas well pollutes the water and leaks some methane, a much stronger greenhouse gas than CO<sub>2</sub>. Nor are we told that production from these wells declines in a few years, so the cheap supply depends on continually drilling new wells that will also leak methane.

Global atmospheric methane is rising with the boom in fracking. But because the industry is not obliged to measure the leakage from its wells and infrastructure, we cannot yet show the causal link. The refrain is the same — save money now and don't worry about the long-term costs.

The cold weather has arrived. Last session the Vermont Legislature failed to pass a measure that would tax heating oil to pay for home energy efficiency improvements — even though the return on investment through reduced fuel costs is only a few years. This too shifted costs that are 50 times greater to our children and grandchildren, and to the Earth itself. Clearly this is a moral issue.