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Envisioning a sustainable energy future

It was cold but sunny on the first day of spring. My garden was dry enough, so I started turning over my cover crop of winter rye. The previous two winters I had been able to do this in January, but this year in January the ground was frozen hard. It takes a lot of heat to melt the ice, and the soil temperature stays at 32 degrees until all the ground-ice has melted. Seeds won't germinate in cold soil; we have to wait a few more weeks for the ground to warm up as the sun gets higher in the sky. Then we can plant our cool weather crops like peas and lettuce.

As the ground melts, a lot of water drains out of the soil. This leaves a lighter, aerated soil – easy to dig. My vegetable garden plot has a good southern exposure, and the soil warms and dries out early. I have already planted Buttercrunch lettuce, spinach and radishes and protected them with a little glass cold-frame, which is simply an old window sash that we replaced with more efficient double glazing.

In mid-March, I went to the Climate Change Science Congress in Copenhagen that was reviewing new research results since the 2007 Report of the Intergovernmental Panel on Climate Change. Sadly the news isn't good. Sea-level is rising faster than our models predicted – we will likely see a three-foot rise in sea-level this century (with a

faster rise for centuries to come), unless we make a very rapid transition away from burning fossil fuels. At the same time, less carbon dioxide is dissolving in the southern oceans than expected, so atmospheric CO₂ is increasing faster. The acidification of the oceans also continues, and this is expected to reduce the marine productivity of the coastal regions.

One of the speakers at the conference was the British economist Lord Stern – famous for his 2006 report to the British government which said the investment cost of the transition away from a fossil fuel economy would be tiny compared with the cost of ignoring the issue. He pointed to the financial meltdown and explained it offers a profound lesson in risk. Because the market failed to price risk correctly, unregulated financial institutions took huge risks for profit – until the global system collapsed. His sobering conclusion was this: Unless we properly price the huge climate risk from burning fossil fuels (through a carbon tax and other measures), a climate catastrophe is certain, and it will last for centuries.

On a more hopeful note, Denmark has the highest energy efficiency in Europe. Denmark understands the long-term effort necessary for making the transition to a truly sustainable energy system. The country now gets about 20 percent of its electricity from wind power (both on-land and off-shore turbines). As you cross the bridge from Denmark to Sweden you can see rows of turbines in the sound quietly generating power. Every fifteen minutes, swift electric trains link Denmark's towns together. The new metro system in Copenhagen has a futuristic feel – the rail cars are fully automatic and driverless. The country is planning a transition to more efficient electric cars using surplus wind-power. Denmark has also created an efficient distributed power system, connected by a smart grid.

As a teenager, I rode a bicycle around Europe, so while in Denmark I was delighted to see a prototype of the Aerorider – an aerodynamic and fully weatherproof electric-powered tricycle. Designed for commuting, it has a range of 100 miles on a battery charge and a top speed of 30 miles per hour.

Like Denmark, Vermont is rich in wind power, and we also have extensive biomass resources in our forests. Wood-fired cogeneration units that provide heat and electricity can have a 90 percent overall efficiency.

With long-range planning and investment our state could create a sustainable future. As we emerge from winter here in Vermont, it is time to chart a new course. We know in broad outline how to construct an efficient, sustainable society, powered by renewable energy, so let us summon the individual and collective will to do so.

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ON THE NET

United Kingdom Office of Climate Change : www.hm-treasury.gov.uk/sternreview_index.htm



Danish recumbent electric tricycle: www.aerorider.dk