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## Global Warming Is Reversible

by BERNIE SANDERS

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Scientists now tell us that the crisis of global warming is even worse than their earlier projections. Daily front-page headlines of environmental disasters give an inkling of what we can expect in the future, multiplied many times over: droughts, floods, severe weather disturbances, loss of drinking water and farmland and conflicts over declining natural resources.

Yet the situation is by no means hopeless. Major advances and technological breakthroughs are being made in the United States and throughout the world that are giving us the tools to cut carbon emissions dramatically, break our dependency on fossil fuels and move to energy efficiency and sustainable energy. In fact, the truth rarely uttered in Washington is that with strong governmental leadership the crisis of global warming is not only solvable; it can be done while improving the standard of living of the people of this country and others around the world. And it can be done with the knowledge and technology that we have today; future advances will only make the task easier.

What should we be doing now?

First, we need strong legislation that dramatically cuts back on carbon emissions. The [Global Warming Pollution Reduction Act](#) (S. 309), a bill that I introduced with Senator Barbara Boxer and that now has eighteen co-sponsors, would reduce greenhouse gas emissions by 80 percent by the year 2050.

Second, if the federal government begins the process of transforming our energy system by investing heavily in energy efficiency and sustainable energy, we can accomplish the 80 percent carbon reduction level and, at the same time, create millions of high-paying jobs.

Energy efficiency is the easiest, quickest and least expensive path toward the lowering of carbon emissions. My hometown of Burlington, Vermont, despite strong economic growth, consumes no more electricity today than it did sixteen years ago because of a successful effort to make our homes, offices, schools and other buildings more energy-efficient. In California, which has a growing economy, electric consumption per person has remained steady over the past twenty years because of that state's commitment to energy efficiency.

Numerous studies tell us that retrofitting older buildings and establishing strong efficiency standards for new construction can cut fuel and energy consumption by at least 40 percent. Those savings would increase with the adoption of new technologies such as [LED light bulbs](#), which consume as little as 10 percent of the electricity that incandescent bulbs do and last twenty years.

Transportation must also be addressed in a serious manner. It is insane that we are driving cars today that get the same twenty-five miles per gallon that US cars did twenty years ago. If Europe and Japan can engineer their vehicles to average more than forty-four miles per gallon, we can do at least as well. Simply raising fuel-efficiency standards to forty miles per gallon would save roughly the same amount of oil as we import from Saudi Arabia and would dramatically lower carbon emissions. We should also rebuild and expand our decaying rail and subway systems and

provide energy-efficient buses in rural America so that travelers have an alternative to the automobile.

Sustainable energies such as wind, solar and geothermal have tremendous potential and often cost no more than fossil fuels (and, in some cases, even less). Increased production and research should cause sustainable energy prices to decline steeply in the future.

Wind power is the fastest growing source of new energy in the world and in the United States, but we have barely begun to tap its potential. Denmark, for example, generates 20 percent of its electricity from wind. We should be supporting wind energy not only through the creation of large wind farms in the appropriate areas but through the use of small, inexpensive wind turbines available today that can be used in homes and farms throughout rural America. These small turbines can produce, depending on location, more than half the electricity that an average home consumes while saving consumers money on their electric bills.

Solar energy is another rapidly expanding technology. In Germany, a quarter of a million homes are now producing electricity through rooftop photovoltaic units, and the cost of that technology is expected to decline steeply. California is providing strong incentives so that 1 million homes will have solar units in the next ten years. The potential of solar energy, however, goes far beyond rooftop photovoltaic units. Right now, in Nevada, a solar plant is generating fifty-six megawatts of electricity. According to the National Renewable Energy Laboratory of the US Energy Department, "Solar energy represents a huge domestic energy resource for the United States, particularly in the Southwest where the deserts have some of the best solar resource levels in the world. For example, an area approximately 12 percent the size of Nevada has the potential to supply all of the electric needs of the United States."

As a strong indication of what the future holds, Pacific Gas and Electric, the largest electric utility in the country, has recently signed a contract to build a 535-megawatt solar thermal plant in the Mojave Desert. This plant, which should be operating in about four years, will have an output equivalent to a small nuclear power plant and will produce electricity for about 400,000 homes. Most important, the price of the electricity generated by this plant, about 10 cents per kilowatt hour, is competitive with other fuels today and will be much cheaper than other fuels by the end of the twenty-five-year contract. Experts in the industry say that dozens of these plants can be built within the next twenty years.

Geothermal energy, the heat from deep inside the earth, is another overlooked resource with real potential. It is free, renewable and can be used for electricity generation and direct heating. A recent report for the US Energy Department by the Massachusetts Institute of Technology suggests that geothermal could supply 100,000 megawatts of new carbon-free electricity at less than 10 cents per kilowatt hour, the going rate today. It is estimated that electricity from geothermal sources could provide 10 percent of the US baseload energy needs in 2050.

As the nation at last confronts global warming, it is no time for denial, greed, cynicism or pessimism. It is a time for vision and international leadership. It is a time for transforming our energy system from the polluting and carbon-emitting technologies of the nineteenth century into the unlimited and extraordinary energy possibilities of the twenty-first. When we do that we will not only solve the global warming crisis; we will open up unimaginable opportunities for improving life all over the planet.