

EFFECTS OF GLOBAL WARMING ON THE STATE OF COLORADO

GLOBAL WARMING WILL HURT COLORADO

The vast majority of the world's leading scientists now agree that human activities may lead to substantial impacts on the global climate. Consensus estimates warn of an average increase in temperatures of between 2 and 10 degrees Celsius over the next century, leading to more severe drought, rising sea levels, shifting seasons, and increased disease.

In Colorado, this could lead to a number of problems. Projections show temperature increases of about 4 degrees Fahrenheit year-round. Higher temperatures and more frequent heat waves could increase heat-related deaths and illnesses from

IMPACTS ON COLORADO

- More frequent heat waves
- Increased illness from insect-borne diseases
- Shortened ski season
- Reduced summer water flows and increased irrigation needs

insect-borne diseases like malaria, West Nile virus. Colorado led the nation in West Nile infections in 2003 with nearly 3000 reported cases. Increased temperatures could cause a northward shift in Western equine encephalitis in the state and make the state more habitable for disease-carrying mosquitoes, likely leading to increased infections among humans and livestock.

Along with rising temperatures, weather patterns may shift in significant ways. Total precipitation in the state may actually increase but will mainly take the form of increased winter precipitation in the form of rain. Increased temperatures would lead to earlier spring and summer snowmelt and lower summer reservoir levels. Reservoirs in the state tend to be relatively low capacity, limiting their ability to manage these increased seasonal variations in surface water flows. At the same time, increased soil temperatures and evaporation rates would increase the summer demand for water. Only half of Colorado farmland is irrigated. Reduced water flows would increase the need for large investments in irrigation systems at the same time that summer water resources may be shrinking. Increased temperatures could also have a substantial impact on the tourist industry, with a shortened spring skiing season and increased threat of summer forest fires.

THE "CLIMATE STEWARDSHIP ACT"

The Climate Stewardship Act (CSA), introduced in the Senate by Senators McCain and Lieberman, and in the House by Representatives Gilchrest and Olver, is based on a similar and highly successful program implemented in the Clean Air Act, which has led to large reductions in acid rain-causing pollution with a minimum of economic costs. CSA would create a market-based cap-and-trade system to reduce emissions of carbon dioxide (CO₂) and other heat-trapping gases from electricity generators and other large industrial and commercial sources, covering 85% of the nation's emissions.

Under a cap-and-trade system, a fixed number of emissions allowances are distributed to emitters. One permit allows the holder to emit one metric ton of CO₂ or an equivalent amount of other gases. Companies that can run their business without using all their allowances can sell their surplus to companies whose actual emissions exceed their allowances.

Under such a system, emissions are reduced by those who can do it at the lowest cost, thus minimizing economic impacts. Cap-and-trade systems make reducing pollution a potential source of profit for companies, giving them an incentive to devise new and cheaper ways to cut emissions.

Beginning in 2010, the CSA would cap emissions at their 2000 levels. To help meet this target, the Act contains various flexible mechanisms allowing companies to meet their reduction targets through a variety of ways, including investments in clean energy projects outside the U.S., international trading of emission credits and storage of carbon in trees and the soil.

ECONOMIC IMPACTS

Estimates show that the benefits of the CSA would outweigh its costs by a ratio approaching 2:1. While the Act's provisions would impose about \$150 billion (net present value) in emissions reduction costs nationwide, it would generate

\$250 billion worth of benefits in the form of increased energy efficiency, reduced energy expenditures and economic growth through 2025. Nationwide, we estimate that the Act would create over 500,000 jobs by 2015. Our analysis is based on research from the Tellus Institute (www.tellus.org), a non-profit research and consulting organization, which studied the impact of the Act's cap-and-trade program as well as energy efficiency programs that would be funded by the Act.

Like the nation as a whole, our analysis shows that the net impact of the Act on jobs in Colorado is also positive. By 2015 over 8,600 more new jobs would be created over a business-as-usual approach, growing to almost 14,000 new jobs by 2025. The gains would be spread throughout the state's economy, and while the mining and utility sectors could suffer some job losses statewide, these would be more than offset elsewhere through growth in construction and other industries.

CLIMATE STEWARDSHIP ACT

- Cap and Trade
- Similar program reduced acid rain by 50% at 1/10 the estimated cost
- Lowest cost solution
- Protects rural electric co-ops

COST-EFFECTIVE FOR THE UNITED STATES

- \$250 billion benefits at cost of \$150 billion
- 500,000 new jobs by 2015

In addition, Colorado has substantial wind energy resources, ranking 11th in the nation. While the state has already begun to tap into this potential, the vast majority of wind resources remain untouched. Wind potential is estimated to be over 450 billion kilowatt hours a year, or about ten times the amount of electricity used in the state in 2000. Further developing the state's wind resources could generate substantial economic benefits, not only for the energy sector but also for farmers and ranchers who stand to gain by leasing parts of their land to wind generators. A 2,000-acre ranch would likely receive over \$100,000 in land rental fees, while losing access to only about 20 acres. Given Colorado's substantial potential for wind power projects, the state could also see an upsurge in the manufacturing sector to supply the necessary machinery and other components not only within the state, but also for export to other states, as the Act would spur additional demand for wind power equipment nationwide. Colorado also stands to gain from the increased use of cellulosic ethanol made from agricultural and forestry wastes as well as dedicated energy crops.

IMPACTS ON COLORADO

- Net increase of 8,600 jobs by 2015
- Provides incentives for clean technologies
- Fostering local production of wind power components

Nationally, not all sectors of the economy would benefit. Reducing CO₂ and other emissions would require reduced use of fossil fuels where carbon cannot be captured, leading to economic contraction in those sectors. Increasing energy efficiency, while providing substantial benefits to both residential and commercial energy consumers, leads to reduced demand for electricity, posing some costs on that sector as well. Overall, however, these costs are more than offset by gains in other sectors, like construction and manufacturing, which would see a substantial increase in demand spurred by the increased use of renewable energy technologies and energy-efficient buildings and equipment. The manufacturing sector would also see increased employment with increased demand for energy-efficient equipment.

The CSA will also create incentives to accelerate the deployment and development of electricity generation from gasifying coal (integrated gasification combined cycle, IGCC) combined with technologies that capture the CO₂ and store it permanently in geologic repositories. While IGCC is a proven and available technology and has been shown to be substantially cleaner than conventional coal-fired power plants, it has yet to gain significant market share. Current government policies are inadequate to deliver economically attractive systems. To accelerate the deployment of IGCC and further development of carbon capture and storage systems, along with the jobs they can create, in the time frame needed to address global warming, we must adopt rea-

OTHER BENEFITS

- Consumers save through energy efficiency improvements
- Cleaner air through more efficient electricity generation

sonable, binding measures to limit global warming emissions. Only then will the private sector have a business rationale for prioritizing investment in this area.

Colorado's consumers also stand to benefit from the CSA. The energy efficiency provisions included in the Act will generate substantial savings in the form of reduced energy expenditures. While energy prices will increase moderately as a result of the pollution reduction requirements in the Act, these costs will be offset by reduced consumption and rebates from the revenue raised by allowance sales. Energy savings for households and businesses will free up substantial resources that can be reinvested in state and local economies.

While Colorado currently does not have a substantial air quality problem, over 85% of the electricity generated in the state comes from coal-fired power plants. Coal-fired power plants emit fine particles, which trigger respiratory illnesses and increased mortality rates, and sulfur dioxide and nitrogen oxides, known precursors of acid rain, which can damage forests, water and wildlife. Coal-fired power is also a substantial source of mercury, a known human neurotoxin. The CSA would help advance cleaner, more efficient power production, such as renewable energy and clean coal technologies like IGCC. Such technologies will reduce global warming pollution and address these environmental problems.

DON'T UNDERESTIMATE ENTREPRENEURIAL INNOVATION

As the CSA is debated, a handful of naysayers will undoubtedly claim that doing anything to reduce global warming pollution will be economically disastrous. A close look at these dire predictions will reveal that they have little merit. For example, one is based on a 1998 study of the Kyoto Protocol, a substantially different proposal than the CSA. The study was written by the same "hired guns" that produced the roundly discredited report claiming to show enormous economic benefits from opening the Arctic National Wildlife Refuge to oil drilling. Both these studies were funded by the oil industry.

Studies predicting economic disaster from environmental protection invariably underestimate the ability of American businesses to innovate to solve new problems. When the Clean Air Act Amendments were debated in 1990, industry lobbyists predicted that the law would turn America into a third rate economic power. Not only have businesses survived the Clean Air Act, but we have thrived. Climate change is a problem that needs to be addressed. Our leaders need to have confidence in our ability to innovate.

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