
# Global Warming: a Time to Act

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Members and friends of the Commonwealth Club, I am pleased to be here tonight to discuss global warming -- the greatest environmental challenge facing this planet. So let me get right to it.

The first seven months of this year were the warmest in the U.S. since national-scale record-keeping began in 1895.

And based on nearly every scientific projection, it's only going to get warmer. The question is how warm and why?

First, how warm?

If further temperature increases are kept to 1 to 2 degrees Fahrenheit, it is manageable. But if warming increases to 5 to 9 degrees or even more, the effects on our planet will be catastrophic. We must begin to take certain steps now.

So, each of us is confronted with a choice -- a choice that will impact not only our future, but the futures of our children and grandchildren.

Do we continue with a business-as-usual attitude? Or do we make the changes needed to prevent catastrophe?

Now for the question, why?

Quite simply, because we are addicted to fossil fuels.

And it is the burning of these fuels – coal, oil, gasoline and natural gas and the resultant greenhouse gas emissions – that is the primary cause of global warming.

Carbon dioxide, the most plentiful of the manmade greenhouse gases, is produced by power plants, cars, manufacturing, and by residential and commercial building components.

And here is the key: Carbon dioxide doesn't dissipate quickly. It stays in the atmosphere for five decades or more – causing Earth's temperature to rise.

That means that much of the carbon dioxide produced in the 1950s, 1960s, 1970s, and 1980s is still in the atmosphere today. And the carbon dioxide produced today will still be in the atmosphere in 2050 and beyond.

Many of the world's most preeminent scientists – including those at the Scripps Institution of Oceanography, other University of California campuses, and the Lawrence Livermore National Laboratory – all predict serious consequences for our planet unless we make major changes in our consumption of energy and strongly move away from energy sources that produce the gases that cause global warming – namely carbon dioxide, nitrous oxide and methane.

They say that to stabilize the planet's climate by the end of the century, we need a 70 percent reduction in carbon dioxide emissions below 1990 levels by 2050.

So the goal should be to stabilize carbon dioxide at 450 parts per million by 2050. This could restrict further warming to 1 to 2 degrees Fahrenheit.

The Earth has already warmed 1 degree in the past century and we're seeing the dramatic effects:

- The 1990s were the hottest decade since record keeping was begun, and, judging from tree rings and other proxy measures, probably during the last 2,000 years.
- Glaciers are melting; coral reefs are dying; species are disappearing.
- Extreme weather patterns have evolved – heat waves, droughts, hurricanes, and floods – and there are signs that they may be occurring with greater frequency and greater intensity.

Global warming is also touching us closer to home. Two examples are the shrinking of the western U.S. snow pack and the increasing scope and intensity of forest fires in the west.

And the vast majority of climate scientists think that this is just the beginning of warming symptoms.

Things will only get worse as temperatures rise. <u>The question is how much will the increase be?</u>

If temperatures increase by another 1 to 2 degrees Fahrenheit over the next 50 years, we will see major -- but likely, manageable shifts in the world around us:

- The Sierra-Nevada snow pack would shrink further, perhaps by 30 percent.
- Sea levels would rise some six inches, perhaps more.
- Large wildfires would increase by 10 percent.
- And electricity demand in California would increase by 3 percent.

These are significant changes – but it is possible to adapt to them.

But if nothing is done…if the Earth warms 5 degrees Fahrenheit or more in the next 50 years, the pace of change would increase, our ability to adapt will be much tougher and the face of our planet will change enormously. According to scientific estimates:

Oceans would rise. Flooding would occur. Hurricanes, tornadoes and other severe weather would become more volatile than ever. Malaria would spread.

Here in California: One-half to two-thirds of the Sierra snowpack would disappear -- equal to the water supply for the 16 million people in the LA basin.

Sea levels would rise more than 2 feet, leading to catastrophic flooding – and especially vulnerable would be the San Francisco/Bay Delta, a conduit for much of California's fresh water and home to sensitive tidelands and leveed islands.

Risk of catastrophic wildfire would more than double.

And energy demands would increase 10 to 20 percent in California.

We had a mild taste of that future in July. Here in the City, temperatures spiked to 97 degrees. And it was far worse in other areas of California. More than 160 people died. Death Valley temperatures soared to 126 degrees.

Increasingly, scientists warn us that we may be at a tipping point. Beyond a certain amount of climate change, we lose the ability to avoid catastrophe.

Refuse to act, or act too slowly, and humans will have caused the most sudden temperature shift since the dawn of civilization.

But, if we act soon and decisively, further global warming can be limited to 1 to 2 degrees Fahrenheit. This, I again emphasize, should be our goal.

America emits some 25 percent of the world's greenhouse gases, though we have but 4 percent of its population.

This makes the U.S. the largest emitter of greenhouse gases in the world.

Yet today, the federal government is doing nothing to stop global warming. We should be leading the charge.

Here in the United States, the two most significant pieces of the puzzle are:

- Transportation – cars, trucks, planes, cargo ships – which accounts for approximately 33 percent of carbon dioxide emissions; and

- Electric generation – largely from coal-fired power plants – which accounts for 38 percent of carbon dioxide emissions;

If we were to clean up these two areas, we would go a long way toward our goal of containing temperature increases to 1 or 2 degrees.

Let's begin with transportation. Fundamentally, there are two ways to reduce transportation emissions.

1. improve the fuel efficiency of vehicles.
2. move away from oil and gasoline-based fuels and toward alternatives.

Cars and trucks in the United States produce nearly 1.2 billion tons of carbon dioxide a year – that's 20 percent of U.S. emissions, and 50 percent of all passenger-vehicle emissions all over the world.

The good news is that the technology exists to significantly improve the fuel economy of these vehicles.

The bad news is that Detroit and many foreign auto manufacturers refuse to utilize available technologies to produce increased mileage and better fuel economy.

Senator Olympia Snowe (R-Maine) and I have introduced legislation that would require the mileage for all cars, pick-up trucks, and SUVs are increased from 25 to 35 miles per gallon over the next 10 years.

If this bill becomes law:

- 420 million metric tons of carbon dioxide would be prevented from entering the atmosphere by 2025, the equivalent of taking 90 million cars off the road in one year.

- 2.5 million barrels of oil a day would be saved by 2025. By coincidence, this is the amount of oil imported daily from the Persian Gulf today.

So, if the fuel economy of vehicles is increased, it will be a major step in the right direction.

The other side of the coin is alternative fuels.

As long as our nation continues its addiction to oil, we cannot sufficiently slow the warming trend. Rather, we need to quickly get up and running the development of new, clean technologies and alternative fuels.

This includes the electric plug-in hybrid, bio-diesel fuels, hydrogen power, and E-85 made from cellulosic ethanol.

Thirty-seven million gallons of biodiesel were produced in 2004 in the United States. And that number more than doubled to 75 million gallons in 2005.

But additional incentives are still needed in both the public and private sector to move much more aggressively toward producing and using alternative fuels.

The second major piece of the puzzle is the generation and consumption of electricity. And the biggest culprit here is pulverized coal.

Today, coal-fired power plants in 38 states are the largest source of carbon dioxide in America. Coal, alone, produces about 30 percent of annual carbon-dioxide emissions, or 2.1 billion tons every year.

Globally, coal produces 9.3 billion tons of carbon dioxide every year – or one-third of all global greenhouse gas emissions.

It's absolutely critical that we find ways to clean up coal or find alternatives.

Earlier this year, the Senate Energy Committee held a conference on the way forward on global warming. The clear consensus was that a mandatory cap-and-trade system was the most effective way to prompt changes in energy production, especially with regard to pulverized coal plants.

There have been cap-and-trade bills introduced in the Senate, and we are working to draft one that would create a national framework within which greenhouse gas emissions from coal plants, utilities, the transportation sector and other major carbon dioxide producers can be reduced.

Here's how it would work:

A cap on the amount of critical global warming gases – including carbon dioxide, methane, and nitrous oxide – would be established on all major emitters.

In all likelihood, the cap would remain at present levels for a period of time to allow companies to change their operations.

Gradually, these caps would be tightened, until the desired level is reached.

Coal plants would have two ways to meet the cap: either implement new technologies, or purchase credits from other companies that have reduced their emissions below the target cap. *(A credit essentially is an allowance to emit a ton of greenhouse gases.)*

So, the cap would be met—and national levels of carbon dioxide would be reduced.

Peter Darbee, the CEO of PG&E, who is here tonight, agrees that we need to act now, and PG&E is helping us with the necessary modeling and analysis of a practical and doable program.

One of the key elements of our program is that it would allow farmers and foresters to participate and earn credits for emission reductions through green practices.

These include:

- tilling land less frequently;
- planting trees on vacant land; and
- converting crops to those that can be used for bio-fuels.

Farmers and growers would be able to earn dollars for acres converted to carbon sequestration and reduction.

Details are still being worked out, but a properly implemented cap-and-trade program can work. Here's an example:

Using the Clean Air Act, cap and trade was implemented in the 1980s to target sulfur dioxide and nitrogen oxide emissions from electric utility plants in the northeast, the primary culprits of acid rain.

In the 16 years it has been in place, sulfur dioxide emissions have been reduced by about 34 percent (5 million tons) and nitrogen oxide emissions have been reduced by 43 percent (3 million tons). So cap and trade has been used and it has been effective.

But cleaning up electric generation is not enough. America needs to become much more energy efficient.

Residential and commercial buildings account for 40 percent of U.S. energy use.

And an aggressive energy efficiency program could prevent a substantial amount of carbon dioxide going into the air.

For example, if all new construction and major retrofits were required to incorporate energy efficient building materials – such as insulation, more efficient windows, and renewable technologies like solar or wind, a significant reduction of carbon dioxide would result.

Green construction is also cost-effective. An initial $100,000 investment can result in a savings of $1 million or more over the life of the building.

Another example: incentivizing the purchase of energy efficient appliances.

ENERGY STAR home products, such as air conditioners, furnaces, refrigerators, dishwashers, phones, DVD players, and televisions, must become a standard buying practice for all Americans.

In 2005, these products saved consumers $12 billion, and reduced emissions by nearly 5 percent, an amount equal to taking 23 million cars off the road.

In California, energy use per person has not gone up in the past 20 years, while national energy use has skyrocketed by 50 percent. To be specific, Californians use 6,000 kilowatt-hours a year per person, while the national average is 12,000 kilowatt-hours.

Last September, the State announced a $2 billion energy efficiency and conservation program to decrease carbon dioxide emissions by approximately 3.8 million tons by 2008.

That is the equivalent of reducing California's electricity emissions by 3.5%, or taking 650,000 cars off the road.

California's program can and should be replicated on a national level.

Individuals can also make a difference. Here are a few suggestions, all of which save energy and reduce carbon dioxide emissions:

- Purchase energy-efficient light bulbs. A 30-watt compact fluorescent bulb is equivalent to a 100-watt light bulb and will reduce more than 1,300 pounds of carbon dioxide over the life of the bulb;

- Turn down your hot water heater by 10 degrees. That would save 660 pounds of carbon dioxide per household from being emitted into the air. If every household were to do it, California alone would avoid emitting 3.8 million tons of carbon dioxide.

- Wash four out of five loads of laundry in cold water. That avoids 460 pounds of carbon dioxide from being emitted per household per year, or 2.7 million tons for all of California.

- Run your dishwasher only with a full load. That avoids 200 pounds of carbon dioxide from being emitted per household per year, or 1.2 million tons for all of California.

- Turn your air conditioner thermostat up a single degree. That avoids 220 pounds of carbon dioxide from being emitted per household per year, or 1.3 million tons for all of California.

- Carpool 2 days a week. That avoids 1,590 pounds of carbon dioxide from being emitted per household per year, or 9.2 million metric tons for all of California.

- Keep your tires properly inflated. That avoids 250 pounds of carbon dioxide from being emitted per household per year, or 1.5 million tons for all of California.

All of these are easy to do and they can make a difference.

It is doubtful, in the short time remaining in this legislative session, that we will see action on global warming.

So in January, on the first day of the new Congress, I plan to introduce these three bills:

- A sound mandatory cap and trade program, which could reduce emissions by 10 percent or more by 2025;

- A mandatory requirement that all passenger vehicles – cars, SUVs and light trucks – have increased mileage of 10 mpg within the next 10 years. That means mileage would go from 25 mpg today to 35 mpg by model year 2017.

- A national energy efficiency program -- modeled after what California has achieved, including strict appliance and building standards and requiring utilities to use energy efficiency measures to meet a portion of their demand.

These bills are just the beginning, global warming will be my top environmental priority in the coming Congress.

Finally, the U.S. should make addressing global warming a top priority and join the European Union and other nations in reducing emissions.

The carbon dioxide in the atmosphere comes from all countries and affects all countries.

The U.S. can, and must lead, but it cannot solve the problem itself. All countries must participate in a global solution to a global problem. China, India, Brazil and other developing economies must be weaned away from fossil fuels.

The Kyoto Protocol is certainly not perfect, and it will expire in 2012. But the U.S. needs to be a leader to ensure that there is a framework in place after 2012 to prevent catastrophic climate change.

The U.S. should also lead an effort with China to raise a public-private partnership fund to prioritize bilateral global warming projects.

Today, the U.S. and China are the world's largest emitters of greenhouse gases. For China, reliance on coal remains chiefly responsible for its carbon dioxide output.

In fact, China's coal use outpaces that of the U.S., EU, and Japan combined. Coal accounts for 70 percent of China's energy needs. And consumption is increasing by 14 percent annually.

China, on its current trajectory, will soon pass the U.S. as the biggest emitter of carbon dioxide.

So a private/public partnership that funds key carbon dioxide reduction projects on a bilateral basis would be an effective way for our countries to work together.

This proposal was made at the Aspen Strategy Group symposium a few weeks ago and it had a very positive response.

Taken together, the policies I've outlined tonight can make a significant difference. You have to look no further than across the Atlantic Ocean to see what can be accomplished.

Already Great Britain has brought its emissions to 14 percent below 1990 levels.

They've done this through a comprehensive program requiring commercial electricity suppliers to generate 10 percent of their electricity from renewables by 2010, making grants available for the installation of renewable sources, and providing incentives for the use of more fuel-efficient vehicles and alternative fuels.

The Senate passed a similar bill last year, but, unfortunately, it was dropped in conference by the Republican majority. I will work with Senator Bingaman, the bill's sponsor, on moving this again next year.

The good news is that California has entered into a groundbreaking partnership with Great Britain to address climate change by sharing of best practices on how to reduce carbon dioxide emissions.

And this is just one part of the State's efforts to take the lead on global warming.

Additionally, the State has enacted a law requiring a 30 percent reduction in greenhouse gases from the tailpipes of passenger vehicles by 2016. This will help the State reduce emissions by 80 percent below 1990 levels by 2050.

Ten other States have followed California's lead, and Canada has adopted similar regulations.

California is also considering legislation that would reduce greenhouse gas emissions further --- to 2000 levels by 2010 and to 1990 levels by 2020.

And earlier this month, Los Angeles joined the Clinton Climate Initiative, along with 21 of the world's largest cities to create an international consortium to reduce costs on energy-efficient products and share ideas on cutting greenhouse gas pollution.

With every challenge comes a new opportunity, and California is well positioned to take advantage of a new low-carbon economy.

The State has already begun to reap the economic benefits of cleaner, greener, and more efficient technologies and standards.

For example, substantial venture capital funding is available today for clean energy projects.

And these new start-ups are expected to generate between 48,000 and 75,000 new jobs over the next five years.

Here are just a few of the most promising:

- A Silicon Valley start-up -- Ion America -- has raised $165 million to develop clean fuel cells that will produce both electricity and hydrogen to fuel our vehicles.

- Bill Gates has joined with venture capitalist Vinod Khosla to spearhead investment efforts in ethanol plants which, when completed, will produce 220 million gallons by 2009.

- And others are investing in new ideas – inexpensive solar panels, windmills that can be built in your backyard for $10,000, and geothermal energy that harnesses the heat of the Earth.

California is leading the way. But we're not alone. Other states are joining together to limit emissions.

The governors of seven northeastern states are helping lead the fight against global warming by instituting a cap-and trade system known as the Regional Greenhouse Gas Initiative.

Their plan is to cap carbon dioxide emissions from electricity plants at current levels until 2015; and then begin reducing emissions incrementally to achieve a 10% reduction by 2019. (Participating states are: Connecticut, Delaware, Maine, New Hampshire, New York, New Jersey, and Vermont. Maryland will become a participating state in June, 2007.)

These efforts by California and other states are important. But in the end, we need to see national leadership and strong national mandates and incentives to do what needs to be done.

Working together, I believe we can reduce our emissions sufficiently to stabilize the Earth's climate, to minimize warming, and slow global temperature increases to 1-2 degrees to avoid catastrophic climate change.

Here is what I ask of you.

Be energy conscious.

Bring pressure on your utility, your government, and commit yourself and your family to reduce energy consumption.

Don't shift the burden to the next generation.

The choice is clear.

It is time to stop talking and to begin acting.