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Global Warming: What Should Texas Do?



By Iain Murray | *April 2007*

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ABOUT THE AUTHOR

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Originally from the United Kingdom, Murray emigrated to the United States in 1997, after having worked at the British Department of Transport, advising Ministers on railroad privatization, the role of private finance in infrastructure investment, and the role of transportation in the economic development of London.

Murray's writings have appeared in many places, including *Encyclopaedia Britannica*, *The Wall Street Journal*, *The Financial Times*, *USA Today, The Washington Post*, *The Chicago Tribune*, *The San Francisco Chronicle*, *The Denver Post*, and *The (London) Spectator*. He is also a Visiting Fellow of the British think tank Civitas, and the Institute for the Study of Civil Society, for whom he has written two monographs on prison and offender rehabilitation in the United States.

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Global Warming: What Should Texas Do?

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EXECUTIVE SUMMARY

As Texas electricity prices have climbed alongside natural gas prices, how to achieve affordable yet reliable energy has become a highly debated topic. The market has responded to higher prices with plans for new coal-fired and nuclear generation facilities. As many as 19 new coal-fired plants have been under consideration. Perhaps the harshest critics of new coal-fired generation in Texas comes from those concerned about global warming. The number of bills filed in the Texas Legislature testifies to the heightened interest and debate.

Of course, global warming is not a Texas-specific, or even a national, issue, but one of global concern. However, the concerns are not centered solely on the environmental impact of global warming; some are more concerned about the harmful economic effects on society from regulations designed to reduce global warming, while others question the effectiveness of such regulations.

It is helpful to begin any discussion of global warming and our energy system's role in it by recognizing how much disinformation and obfuscation there is surrounding the issue. Despite the claims that the debate is over and we should move quickly and firmly to regulate carbon dioxide (CO_2) emissions, the state of global warming science remains uncertain. As one study put it, "agreements such as the Kyoto protocol that intend to reduce emissions of anthropogenic greenhouse gases [could] be less effective than thought."

An important point always to remember when discussing anything relating to global warming is that we are talking about energy use as the primary source of greenhouse gases. When environmental lobbyists accuse energy use of contributing to the global warming problem, they almost always gloss over the many benefits of affordable energy.

Affordable energy is a cornerstone of American prosperity. Its absence during power cuts or other supply crises leads to material deprivation and hardship. Its presence provides a stream of goods and services that contribute to material well-being. The reliability of an energy supply is fundamental to maintaining and encouraging economic growth. We should therefore be wary of policies that seek to increase the cost of energy or that threaten its reliability.

This paper answers a variety of questions related to global warming, including:

- Isn't there a scientific consensus that global warming is both real and bad for us?
- What do scientists agree on?
- What don't scientists know yet?
- Don't climate models warn of alarming future warming?
- Why is economics important to the study of global warming?
- Isn't Europe on track to meet its Kyoto targets?
- What should Texas do about global warming?

The supposed damages of global warming are well-known, but it is rarely admitted that global warming brings benefits as well. Neither does the discussion often focus on the costs and effectiveness of proposed solutions. When these topics are closely examined, it becomes less certain that there is any need for Texas (or anyone else) to take action to regulate or reduce CO_2 emissions.

While it is true that CO_2 emissions in Texas are the largest in the United States and represent 11.8 percent of the U.S.'s total CO_2 emissions, this should not be surprising. A significant percentage of critical products, the production of which results in CO_2 emissions, is produced in Texas. Furthermore, there is a strong correlation between CO_2 emissions and economic growth in Texas. And, Texans are learning how to grow the economy much more efficiently relative to CO_2 emissions—efficiency in CO_2 emissions in Texas increased by over 1,000 percent between 1963 and 2001.

Efforts to reduce CO_2 emissions would be disastrous to Texas bustling economy. By examining proposals to tax CO_2 emissions, this study determines that such efforts could cost Texas families up to $1,149 per year in extra electricity costs.

Texas' lead environmental agency has already considered, and rejected, the need for state regulation of greenhouse gases. Our state should concentrate on planning to meet its demands for electricity and on growing the state's resiliency. Any other approach will put Texans' incomes, jobs and health at risk, all for no discernable benefit from emissions reduction.

FINDINGS FROM THIS PAPER

- The global warming debate is subject to obfuscation and misrepresentation.
- Significant uncertainties remain in basic areas of climate science.
- The benefits of affordable energy to Texas, the U.S., and the world are immense.
- Emissions reductions are not the best way to tackle the potential damages of global warming.
- Global warming is not all downside.
- Resilient societies are wealthier, healthier, and cleaner.
- Texas requires greater energy capacity to meet its demand or it will suffer hardship.
- Cap and trade schemes are failing where they are being tried.
- Spending money on global warming is actually a bad investment.
- Even accounting for the cost of carbon emissions is imprudent.

INTRODUCTION

As already noted, how to achieve affordable yet reliable energy is a highly debated topic in Texas. Proposed regulatory solutions include higher taxes and subsidies for renewable energy from wind, ethanol and biomass, conservation and demand management, and re-regulation of the Texas electric market. However, all these miss the mark. Taxes and subsidies simply make electricity more expensive, and renewable resources cannot provide the scale and reliability needed to fuel tomorrow's growth. Rather than make prices more expensive, deregulation has helped electricity prices withstand a major price shock from natural gas, keeping Texas rates in the middle of the pack of those states that rely heavily on natural gas for generation, and below many East Coast states. So while electricity prices are higher than in the past, Texans are in relatively good shape compared to many others. A long-term solution for securing affordable, reliable energy supplies must rely on a proper understanding of the current situation and market-based innovations.

In contrast to the political process, the market has responded to higher electricity prices with plans for new coal-fired and nuclear generation facilities. The low cost and reliability of these types of generation make them ideal for meeting Texas' future electric needs at a much lower cost. While additional nuclear generation is still more than a decade away, coal-fired plants are readily available and could begin production within two to three years. As many as 19 new coal-fired plants have been under consideration. Of course, Texas' plans for more coal plants have come under heavy criticism by activists who have sought to reduce energy consumption by increasing its costs. They complain that Texas is ignoring global trends toward more "environmentally friendly" means of energy production.

However, Texas' plans for using coal are on track with just about everyone else in the world. Coal is making an enormous revival. For instance:

- Approximately 150 new coal-fired power plants have been proposed in the U. S., most are conventional;
- Over 800 new coal-fired power plants are being built or proposed worldwide;
- China is building approximately one new coal-fired power plant a week; and
- There has been a significant return to coal in Japan, Germany, and the United Kingdom.

Perhaps the harshest critics of new coal-fired generation in Texas comes from those concerned about global warming. "We will be the biggest loser in the global warming debate, or the biggest winners, and that is what our state faces," said Tom "Smitty" Smith, the executive director of Public Citizen's Texas office. In fact, Texas has become a focal point in the worldwide debate over global warming. The number of bills filed in the Texas Legislature testifies to the heightened interest and debate. At least 12 bills call for some action related to global warming, from studies to regulation of carbon dioxide (CO_2) emissions.

Of course, global warming is not a Texas-specific, or even a national, issue, but one of global concern. However, the concerns are not centered solely on the environmental impact of global warming; some are more concerned about the harmful economic effects on society from regulations designed to reduce global warming, while others question the effectiveness of such regulations. This paper takes a look at the entire debate over global warming, placing it in the context of the policy debate in Texas.

GLOBAL WARMING – THE MYTHS

It is helpful to begin any discussion of global warming and our energy system's role in it by recognizing how much disinformation and obfuscation there is surrounding the issue. We can do this by quickly examining five arguments that have recently been advanced for why we should be worried about the issue—arguments that emanate from both right and left in the political spectrum.

Talking*Point:*

We are not in imminent danger of massive sea-level rises.

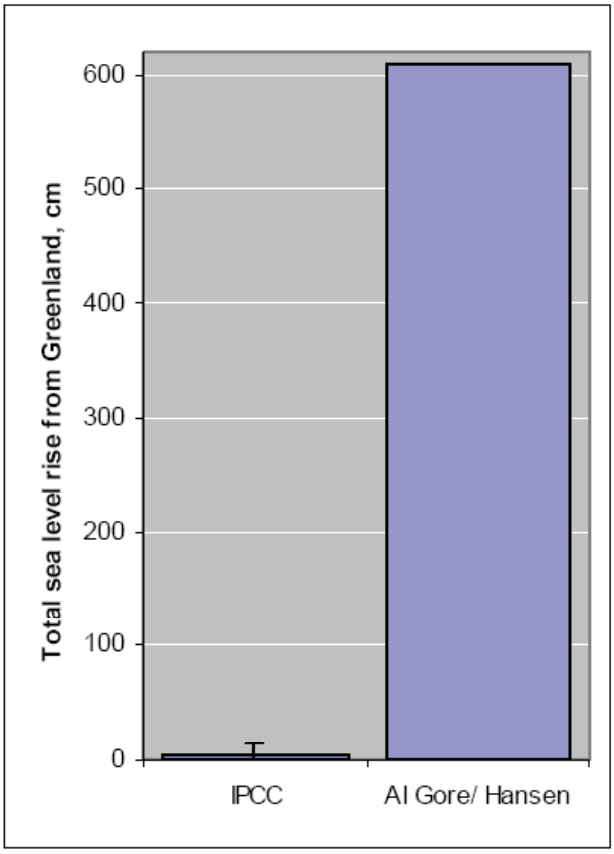
First, we are not in imminent danger of massive sea-level rises. In his movie "An Inconvenient Truth," former Vice-President Al Gore warns of seas rising by 20 feet, and shows a dramatic image of lower Manhattan flooded by the swollen Hudson River.

The estimate of Al Gore and NASA scientist James Hansen of 21st century sea level rise due to the Greenland melt contrasts with the Intergovernmental Panel on Climate Change's (IPCC) estimate of 3.5cm. Al Gore and Hansen expect 609cm, or 174 times more.

But this will only happen if the Greenland and West Antarctic ice sheets disappear overnight—a highly unlikely event. The collected scientists of the IPCC, whose word climate alarmists preach as gospel when convenient, estimates at most, with a massive and unlikely rise in temperature, only 23 inches of sea-level rise this century.

FIGURE 1

Al Gore/Hansen vs. IPCC Estimate of 21st Century Sea Level Rise Due to Greenland Melt.



Source: The estimate of Al Gore/Hansen of 21st century sea level rise due to Greenland melt. The IPCC estimate is 3.5cm, and uncertainty is indicated by the lowest (1cm) and highest (15cm) estimates from all available models. Al Gore and Hansen expect 609cm, or 174 times more .[1]

Moreover, the IPCC recognizes that if we continue building flood defenses at the current slow rate that we are doing around the world, the number of people at risk from sea-level rise —mostly in the developing world—will drop by 90 percent. It will not be too difficult a task to accelerate that program and obviate the problem entirely.

Second, if global warming is as big a threat as claimed, it will not be averted by minor steps like changing a few light bulbs, buying carbon offsets or driving hybrid cars. Gore himself has talked of a "wrenching transformation" in our lifestyles.

That's because everyone acknowledges that the Kyoto Protocol, even when fully and successfully implemented by all its parties, will avert a barely measurable 0.07°C of warming by 2050.[2]

To stop the more extreme estimates of warming, we would need something like 30 Kyotos. President Bush pulled the United States out of the Kyoto process because of its likely cost of tens to hundreds of billions of dollars annually to the U.S. economy.[3]

Third, some national security hawks argue that we must reduce American use of petroleum because it funds Middle Eastern terrorists. This argument is overblown. America actually imports more oil from Africa than it does from the Middle East, which supplies only about 20 percent of our oil imports.

Yet the Middle East produces oil more cheaply than anywhere else. That means that if we were to use less gasoline, it would be the more expensive producers, like Canada and those African states, that would be the first to be hit by falling demand. If that made production in those countries uneconomic, there's actually a chance that our supply of gas from the Middle East would rise.

Fourth, polar bears are not becoming extinct as a result of decreasing Arctic ice. We know that polar bears have survived warmer periods in the past, so there is no reason to suspect they will suffer a threat of extinction now.

The chief polar bear biologist for the Canadian province of Nunavut recently wrote: "Of the 13 populations of polar bears in Canada, 11 are stable or increasing in number. They are not going extinct, or even appear to be affected at present."[4]

Yet if the polar bear is listed as "threatened" under the *Endangered Species Act* because of global warming, environmentalists will be able to block the new power stations and refineries the nation desperately needs.

Finally, the rest of the world is not waiting for America's lead on climate change. Europe has attempted to put a price on carbon and has failed to reduce emissions because of its internal tensions[5] (see more to follow). Measures attempted in Canada, Japan and New Zealand have also failed.

China, India, and the G-77 group of developing nations have outright refused to accept any restriction on their emissions (China could overtake the U.S. as the world's leading greenhouse gas emitter later this year).

The rest of the world has two reasons for demanding American action: First, blaming America absolves them of responsibility and, second, emissions restrictions will hobble America's economy, allowing the rest of the world to play catch-up.

Considerable Uncertainties Remain in Climate Forecasts

Moreover, the state of global warming science remains uncertain, as we shall now discuss.

> *"[E]nhanced variability during pre-industrial times, would result in a redistribution of weight towards the role of natural factors in forcing temperature changes, thereby relatively devaluing the impact of anthropogenic emissions and affecting future predicted scenarios. If that turns out to be the case, agreements such as the Kyoto protocol that intend to reduce emissions of anthropogenic greenhouse gases, would be less effective than thought."*
>
> *– Esper et al., Climate: Past Changes and Future Ranges, November 2005.*[6]

With these words, senior paleoclimatologists reveal just how uncertain the case is that recent global warming has been significantly driven by greenhouse gas emissions. Much of the case relies on the idea that past global temperatures have been broadly stable based on reconstructions of past temperatures known colloquially as "hockey stick" graphs (see, e.g., Mann Bradley & Hughes 1998). However, more recent reconstructions that have avoided some of

the data problems since identified in the "hockey stick" reconstructions (McIntyre & McKitrick, 2003) show much greater volatility in temperature. As Esper and his colleagues admit, this could have significant impact on the attribution of the recent warming to anthropogenic activities.

Such realizations occur all the time in climate science. It is, for instance, becoming increasingly apparent that land surface processes (e.g. agriculture) affect trends in land surface temperatures to an extent that is not insignificant in comparison to the recent trend in global-average surface temperature. That is why it is important to realize that attribution science is in its infancy, not the fully-developed product that some are keen to portray it as.

Talking*Point*:

There are significant issues with conventions of climate modeling that have not been adequately addressed.

Another example of the current uncertainties involved in climate science is the apparent discrepancies between surface temperatures and the atmospheric temperatures measured by satellites and weather balloon radiosondes. Recent refinements in the calculation of atmospheric temperatures have moved them more into alignment with the surface measurement, but they are still much lower than one would expect. Indeed, a November 2005 review of the state of the science by some of the top experts in the field found that:

> "We can no longer absolutely conclude whether globally the troposphere is cooling or warming relative to the surface. Clearly, however, the climate system has evolved in one unique way. Hence the challenge to the climate science community is to understand the reasons for the coherent differences between available datasets, and to discern the true climate evolution. The key first step is to understand the likely sources and causes of errors and biases. Only with this knowledge can we hope to truly reconcile the differences and gain a more complete and accurate picture of the true climate system evolution."[7]

Another example is the Urban Heat Island effect, the phenomenon whereby cities are generally warmer (and have warmed faster than) the surrounding countryside. It was believed that this issue had been settled by a very brief paper in 2004,[8] but further work has since revealed that the issue is far more complicated.[9]

Indeed, the direction of research has prompted considerable doubt as to whether the global-average temperature metric is actually the appropriate metric for measurement of global climate change (see, e.g., Radiative Forcing of Climate Change, National Research Council, 2005). The research referred to in the previous paragraph, for instance, suggests that temperature trends are a function of height near the surface. The lead researcher, Roger Pielke Sr. of Colorado State University, comments on what this means as follows:

> "Clearly, the concept of basing climate policy on such an ambiguously measured climate metric as a globally-averaged surface temperature change is inadequate

> with respect to actual human- and natural-caused climate change. We cannot actually measure such an average directly. Despite its extensive use and long pedigree in the literature and its use in assessments such as in the IPCC reports, a global-averaged surface temperature change based on surface air measurements is not a quantitatively accurate way to communicate climate science to policymakers."[10]

These are fundamental issues with climate science, not mere discussions at the margins, and any serious review of the state of the science will not allow them to be dismissed as such.

Moreover, there are significant issues with conventions of climate modeling that have not been adequately addressed in the literature. University of Virginia climatologist Patrick J. Michaels draws attention to one of these in his recent book, "Meltdown: The Predictable Distortion of Global Warming by Scientists, Politicians and the Media" (Cato Institute, 2004). Discussing the observed trends in atmospheric carbon dioxide over the 29 years (1974-2002) compared with the IPCC model assumptions he finds:

> "The assumption used for future behavior by every climate model (and therefore every climate modeler), which is an exponential growth of 1 percent per year, hasn't been right for three decades. The climate modeling community must know better! But instead, it chooses to be literally 30 years behind the power curve of reality on the issue of atmospheric carbon dioxide concentration. In fact, only one major modeler, the same James Hansen who first drew attention to this issue, has acknowledged this problem and, accordingly, has dramatically dropped his forecasts of warming" (pp. 27-28).

There are, therefore, many compelling reasons to be skeptical of the over-simplification of climate science that is generally indulged in when longer- (or shorter-) term catastrophe is forecast.

Talking*Point:*

There are many compelling reasons to be skeptical of the over-simplification of climate science that is generally indulged in when longer- (or shorter-) term catastrophe is forecast.

The Benefits of Energy

A final point always to remember when discussing anything relating to global warming is that we are talking about energy use primarily as the source of greenhouse gases. When environmental lobbyists accuse energy use of contributing to the global warming problem, they almost always gloss over the many benefits of affordable energy. As environmental energy analyst John Holdren admitted:[11]

> "Energy is an indispensable ingredient of material prosperity. . . . Where and when energy is in short supply or too expensive, people suffer from lack of direct energy services (such as cooking, heating, lighting, and transport) and from inflation, unemployment, and reduced economic output."

Talking*Point:*

When environmental lobbyists accuse energy use of contributing to the global warming problem, they almost always gloss over the many benefits of affordable energy.

Affordable energy is a cornerstone of American prosperity. Its absence during power cuts or other supply crises leads to material deprivation and hardship. Its presence provides a stream of goods and services that contribute to material well-being. The reliability of an energy supply is fundamental to maintaining and encouraging economic growth.

For example, if energy supply is not enough to meet demand, the electric power supply will be interrupted. Lights will go out. Offices will cease to function. People will freeze or swelter. Elderly people will die. If sustained, this situation will severely damage the economy. Jobs will be lost. Health will suffer. The poor will get poorer. Flows of money from America to the developing world will shrink.

One hundred years ago, the average Westerner had an annual income equivalent to $4,000. A man could only work somewhere he could walk to; a woman spent much of her life performing back-breaking domestic labor. Medical science, while advancing, was still almost medieval in its practical application.

Much has changed in the last century, but in all cases the key to freeing us from these strictures has been widespread, affordable energy. A permanent flow of electricity and convenient access to gasoline have powered an explosion in wealth that has enabled millions to live long, fulfilling lives free from crushing hardship. The condition of life is no longer nasty, brutish, and short.

We should therefore be wary of policies that seek to increase the cost of energy or that threaten its reliability.

An example is air conditioning. The development of the technology, powered by affordable energy, has transformed even the most oppressively hot day into one where individuals can engage in economic activity without having to rest or seek shade. Making energy more expensive would result either in less air conditioning being used, with a consequent loss of economic activity, or in a substantial opportunity cost as resources are diverted from other activities to pay for the more expensive air conditioning.

Moreover, it is the market that best balances supply and demand into an affordable price. It cannot be achieved through regulation, which will only result in either an inappropriate price or an inadequate, rationed supply. And the more dynamic the market is allowed to be, the more efficient energy allocation will be achieved.

GLOBAL WARMING - THE FACTS

What do we know about the science and economics of global warming? This section presents a guide to what we can say with any degree of confidence.

Isn't there a scientific consensus that global warming is both real and bad for us?

- There is no "scientific consensus" that global warming will result in damaging climate change. Claims that there is such a consensus mischaracterize the scientific research of bodies like the United Nations Intergovernmental Panel on Climate Change (IPCC) and the U.S. National Academy of Sciences (NAS).

What do scientists agree on?

- Scientists do agree that: 1) global average temperature is about 0.6°Celsius—or just over 1° Fahrenheit—higher than it was a century ago; 2) atmospheric levels of carbon dioxide (CO_2) have risen by about 30 percent over past 200 years; and 3) carbon dioxide, like water vapor, is a greenhouse gas whose increase is likely to warm the Earth's atmosphere.[12]

TalkingPoint:

There is no "scientific consensus" that global warming will result in damaging climate change.

Doesn't this mean we should be worried?

- As Richard Lindzen of MIT summarized it in the *Wall Street Journal*,[13] "These claims [of warming] are true. However, what the public fails to grasp is that the claims neither constitute support for alarm nor establish man's responsibility for the small amount of warming that has occurred. In fact, those who make the most outlandish claims of alarm are actually demonstrating skepticism of the very science they say supports them. It isn't just that the alarmists are trumpeting model results that we know must be wrong. It is that they are trumpeting catastrophes that couldn't happen *even if the models were right* as justifying costly policies to try to prevent global warming."

What don't scientists know yet?

- Scientists do not agree on whether: 1) we know enough to ascribe past temperature changes to carbon dioxide levels; 2) we have enough data to confidently predict future temperature levels; and 3) at what level temperature change might be more damaging than beneficial to life on Earth.

Didn't the National Academy of Sciences (NAS) say greenhouse gases cause global warming?

- The National Academy of Sciences reported in 2001 that, "Because of the large and still uncertain level of natural variability inherent in the climate record and the uncertainties in the time histories of the various forcing agents… a causal linkage between the buildup of greenhouse gases in the atmosphere and the observed climate changes during the 20th century cannot be unequivocally established." It also noted that 20 years' worth of data is not long enough to estimate long-term trends.[14]

Hasn't the Earth warmed precipitously over the past 100 years?

- The temperature rise of 0.6°C over the last century is at the bottom end of what climate models suggest should have happened. This suggests that either the climate is less sensitive to greenhouse gases than previously thought or that some unknown factor is depressing the temperature.[15]

Don't climate models warn of alarming future warming?

- Predictions of 6°C temperature rises over the next 100 years are at the extreme end of the IPCC range, and are the result of faulty economic modeling, not science (see economics section to follow).

Talking*Point*:

Global warming alarmists are trumpeting catastrophes that couldn't happen even if their models are right.

What are the realistic current estimates of future warming?

- Both James Hansen of NASA—the father of greenhouse theory—and his leading critic Richard Lindzen of MIT agree that, even if nothing is done to restrict greenhouse gases, the world will only see a global temperature increase of about 1°C in the next 50-100 years. Hansen and his colleagues "predict additional warming in the next 50 years of 0.5 ± 0.2°C, a warming rate of 0.1 ± 0.04°C per decade."[16]

What about satellite temperature measurements?

- Evidence from satellite and weather balloon soundings suggests that the atmosphere has warmed considerably less than greenhouse theory suggests.[17] These measurements, which cover the whole atmosphere and show only a very slight warming, show a disparity with the surface temperature measurements, which cover only a small fraction of the Earth but show sustained warming.

Hasn't the disagreement between satellite and surface temperatures been resolved?

- No. There is still substantial disagreement between the mid-range of the satellite measurements and the mid-range of the surface measurements. This presents a problem for climate models.

Do other factors besides greenhouse gases influence temperature?

- New research suggests that the role of greenhouse gases in warming has been overestimated, as factors like atmospheric soot,[18] land use change,[19] and solar variation[20] all appear to have contributed significantly to recent warming.

Why is economics important to the study of global warming?

- Predictions of global warming catastrophe are based on models that rely on economics as much as on science. If the science of greenhouse theory is right, then we can only assess its consequences by estimating future production of greenhouse gases from estimates of economic activity.

Is there anything wrong with the economics underlying warming projections?

- The economic modeling by the U.N. Intergovernmental Panel on Climate Change is seriously flawed (*The Economist* called it "dangerously incompetent"), relying on economic forecasts that show much faster growth rates for developing countries than is justified.[21] The IPCC economic scenarios show significantly greater economic growth globally than do other recognized, comparable scenarios.

What will the Kyoto Protocol do to reduce warming?

- The Kyoto Protocol, most observers agree, will have virtually no effect on temperature increase, as it imposes no restrictions on greenhouse gas emissions upon major developing nations like China and India. These nations have publicly refused to accept any restrictions now or in the future.[22]

Can't we reduce emissions without affecting the economy?

- Greenhouse gas emissions derive from energy use which in turn are a function of economic growth. Therefore, nations that restrict greenhouse gas emissions are almost certain to reduce their rate of economic growth.

Isn't global warming all cost and no benefit?

- No. Even substantial global warming is likely to be of benefit to the United States. As eminent Yale Professor Robert Mendehlson testified before the Senate in 2000,[23] "Climate change is likely to result in small net benefits for the United States over the next century. The primary sector that will benefit is agriculture. The large gains in this sector will more than compensate for damages expected in the coastal, energy, and water sectors, unless warming is unexpectedly severe. Forestry is also expected to enjoy small gains. Added together, the United States will likely enjoy small benefits of between $14 and $23 billion a year and will only suffer damages in the neighborhood of $13 billion if warming reaches 5˚C over the next century. Recent predictions of warming by 2100 suggest temperature increases of between 1.5˚C and 4˚C, suggesting that impacts are likely to be beneficial in the U.S."

Haven't economic models predicted no effect of reducing emissions on growth?

- European models of the effect of greenhouse gas emission restrictions are "sectoral" models that look at the effects on only one economic sector and therefore badly underestimate the negative effects of emission restrictions throughout the economy. General equilibrium models, which take into account the effects of emissions restrictions on other economic sectors, show much greater negative economic effects than do sectoral models.[24]

What do the better economic models say Kyoto will do?

- Recent research from general equilibrium models suggests strongly negative impacts on European economies from adopting Kyoto targets (or going beyond the targets, as in the case of the United Kingdom). One model shows the economic effects by 2010 of

Talking*Point:*

Nations that restrict greenhouse gas emissions are almost certain to reduce their rate of economic growth.

adopting Kyoto targets as follows (remember that the Protocol achieves virtually nothing in reducing global temperature):[25]

Germany	-5.2% GDP	-1,800,000 jobs
Spain	-5.0% GDP	-1,000,000 jobs
United Kingdom	-4.5% GDP	-1,000,000 jobs
Netherlands	-3.8% GDP	-240,000 jobs

Isn't Europe on track to meet its Kyoto targets?

- Kyoto targets are unrealistic. Regardless of announced targets, 11 of the 15 pre-enlargement EU countries are on course to increase their greenhouse gas emissions well beyond their individual Kyoto targets (see more to follow).[26]

TalkingPoint:

It is often said that hurricanes are getting stronger in both duration and intensity as a result of global warming. In fact, the scientific jury is still out.

GLOBAL WARMING IMPACTS AND EMISSIONS REDUCTIONS

Hurricanes

It is often said that hurricanes are getting stronger in both duration and intensity as a result of global warming. In fact, the scientific jury is still out.

Roger Pielke, Jr. of the University of Colorado found that once hurricane damage is normalized for changes in population, wealth, and the consumer price index, there is no long-term change in hurricane damage—evidence against the hypothesis that hurricanes are becoming more destructive.[27] Christopher Landsea of NOAA, noting no trend in the Power Dissipation Index (PDI) for land-falling U.S. hurricanes, suggests that MIT Professor Kerry Emanuel's finding of increased destructiveness may be an "artifact of the data"—a consequence of advances in satellite technology, which have improved detection and analysis of non-land-falling hurricanes.[28]

Philip Klotzbach of Colorado State University found "a large increasing trend in tropical cyclone intensity and longevity for the North Atlantic basin and a considerable decreasing trend for the North Pacific," but essentially no trend in other tropical cyclone producing ocean basins.[29] Similarly, Kossin et al. (2007) found an upward trend in hurricane intensity in the Atlantic basin during the past 23 years but not in any of the world's other five hurricane basins.[30]

In reality, the "consensus" of the scientific community is that there is "no consensus" about the relationship between global warming and hurricane strength. That was the verdict of some 120 scientists at a meeting of the World Meteorological Organization:[31]

> "The possibility that greenhouse gas induced global warming may have already caused a substantial increase in some tropical cyclone indices has been raised (e.g. Mann and Emanuel, 2006), but no consensus has been reached on this issue."

It would therefore be premature to use hurricanes as a reason for adopting emissions restrictions. Even if the science were settled, however, emissions restrictions would still be the wrong policy to adopt in order to reduce the impact of hurricanes. As the WMO statement went on to say:

> "The recent increase in societal impact from tropical cyclones has largely been caused by rising concentrations of population and infrastructure in coastal regions."

Quantifications of the relative effects of increased hurricane activity and the rising concentration of humanity and buildings in coastal regions suggest that the latter outweighs the former in terms of effect by fifty to one.[32] A more appropriate policy to reduce the impact of stronger hurricanes—whether natural or mankind-driven—would therefore focus on land use regulations and insurance policy rather than on emissions.

Sea Level Rise[33]

Today, 10 million people are at risk of coastal flooding, and this number is projected to increase by 3 million by 2085 as coastal populations increase. Global warming is expected to raise sea levels modestly by the end of this century—due to such factors as melting ice sheets, storm surges and thermal expansion—putting an additional 81 million people at risk.

Meeting the Kyoto Protocol's emission reduction targets would reduce the total population at risk from coastal flooding in 2085 by 18 percent. Stabilizing CO_2 emissions at 550 ppm would reduce the total population at risk from coastal flooding by approximately 80 percent in 2085. However, this would come at a very high cost.

By contrast, investing an additional $1 billion annually in preventive measures—like building sea walls and other hardened structures and an orderly relocation of coastal populations—would address this problem just as well, if not more effectively.

Malaria and other diseases[34]

Today, some 4.4 billion people worldwide are at risk from malaria spread by disease carrying mosquitoes. This will grow to 8.8 billion people in 2085, even in the absence of climate change, due to increased population in developing countries where the disease is epidemic. Global warming is projected to increase the population at risk by 3 percent (256 to 323 million additional people) in 2085.

This is due to an increase in the range of mosquitoes, for example, to higher altitudes. However, meeting the Kyoto Protocol's emission reduction targets would reduce the population at risk from malaria by only 0.2 percent. Stabilizing CO_2 emissions at 550 ppm would reduce the population at risk from malaria by 0.4 percent.

By contrast, investing an additional $1.5 billion annually on malaria prevention and treatment today would cut the current annual world death toll of malaria in half—from one million to 500,000 a year.

Investment in treating malaria safely and effectively would therefore constitute a no regrets strategy towards the predicted effects of climate change. International efforts should therefore concentrate on finding safe and effective measures to reducing malaria risk. No strategy should be precluded, including the use of DDT where that would be more effective than other measures. National governments should reconsider blanket objections to DDT-based schemes in areas where such action would be effective and appropriate.

Talking*Point:*

Investing an additional $1.5 billion annually on malaria prevention and treatment today would cut the current annual world death toll of malaria in half—from one million to 500,000 a year.

Biodiversity

Due to development and agriculture, the forested area of the world is expected to fall 25 percent to 30 percent by 2050 and the area of coastal wetlands is expected to decline 40 percent by 2085. The major risk to biodiversity is the loss of natural habitat to development. Increased levels of atmospheric CO_2 favor plant growth; however, the effects of global warming on sea levels and weather patterns could reduce wetland area.

Between now and 2085, global warming could increase forested areas by 5 percent; but it could reduce the area of coastal wetlands another 13 percent. Mitigation could cost several trillion dollars, but would have little effect before 2085.

Quick*Fact:*

Between now and 2085, global warming could increase forested areas by 5 percent; but it could reduce the area of coastal wetlands another 13 percent.

At a cost of less than $10 billion annually, the adaptive measures mentioned previously (such as those to reduce hunger, water shortages and costal flooding) could slow, halt or even reverse habitat loss by increasing the efficiency of land and water use.

Moreover, much has been made of the threat posed to coral reefs through global warming, which it is believed may cause more frequent and intense bleaching of coral. However, a new study by scientists in Australia "suggests that ocean warming will foster considerably faster future rates of coral reef growth that will eventually exceed pre-industrial rates by as much as 35 percent by 2100," says lead author Dr. Ben McNeil, an oceanographer at the University of New South Wales.[35] McNeil is not talking about a trivial amount of warming, but a hefty 3.2°C increase in annual mean sea temperatures at coral reefs during the period from 1950 to 2100. In addition to more robust coral growth, the study also predicts that warming will expand corals' habitat range.

Just as CO_2 enrichment of the atmosphere helps most plants grow larger, faster, and more profusely, and just as recent changes in global climate (increased warmth, sunlight, and rainfall) are enhancing the productivity of green biomass in tropical rainforests,[36] so, it appears, CO_2-induced global warming might help build the world's coral reefs.

The scientific jury is still out on whether significant global warming from man-made CO_2 will occur. And if significant warming does occur, it is anybody's guess how the gains to reefs from increased calcification will compare to the losses from more frequent or intense bleaching events. However, it is at least scientifically possible that the carbon-suppression policies advocated by environmentalists would reduce the long-term growth potential and habitat range of reef eco-systems.[37]

THE IGNORED BENEFITS OF GLOBAL WARMING

The supposed damages of global warming are well-known, but it is rarely admitted that global warming brings benefits as well. This section, based on research by leading climate impacts economist Richard Tol,[38] attempts to explain the benefits that could come from a warmer world while we adapt to the costs.

Agriculture

It is well-known that plants feed on carbon dioxide. Therefore, a world with more CO_2 is one in which plant life can thrive. This means that agriculture and forestry can benefit from a warmer world. For agriculture, much depends on the ability of farmers to adapt so that they can, literally, reap these benefits. Assuming adaptation, all areas of the world will benefit

TABLE 1
Impacts of Climate Change on Agriculture

Region	Rate of Change	Level of Change	Optimal Temperature
	%GAP/0.04 °C	%GAP/1 °C	Δ °C wrt 1990
OECD-A	-0.021 (0.031)	0.398 (0.530)	2.29 (1.32)
OECD-E	-0.026 (0.025)	0.838 (0.450)	0.45 (0.50)
OECD-P	-0.016 (0.038)	0.321 (0.648)	2.71 (0.33)
CEE&fSU	-0.028 (0.027)	1.060 (0.452)	2.96 (0.43)
ME	-0.017 (0.011)	0.233 (0.193)	3.08 (0.49)
LA	-0.022 (0.015)	0.221 (0.280)	2.14 (0.26)
S&SEA	-0.022 (0.007)	0.253 (0.132)	2.16 (0.33)
CPA	-0.023 (0.023)	1.239 (0.403)	3.41 (1.01)
AFR	-0.12 (0.006)	0.189 (0.111)	3.00 (0.48)

Source: TOL, 2002.

from even as much as a 2.5°C increase in the global mean temperature. This ranges from a 0.5 percent increase in gross agricultural product in Africa to a 3.1 percent increase in China. Forestry benefits even more, with North America benefiting from a 1°C increase in global temperature to the tune of $218 million a year. Dr. Tol's calculations imply that in all areas of the globe, the optimal temperature for agriculture is higher than it was in 1990. In Africa, for instance, the optimal temperature is actually 3°C higher than 1990. In North America, it is 2.3°C higher.

Heating and Cooling Costs

In a warmer world, we will have to heat our homes and workplaces less in the winter, but probably have to cool them more in the Summer. In most areas of the world, the savings on heating costs work out as greater than the extra expense of cooling. In North America, for instance, a 1°C increase will save $22 million annually in heating costs, but cost only an extra $11 million in cooling. Europe and Africa will spend more, costing them net $7 million and $5 million annually respectively, but everywhere else will benefit or break even on these costs. Globally, the world will save about 1 percent of GDP on heating and spend about 0.6 percent of GDP extra on cooling.

Talking*Point:*

The world will save about 1 percent of GDP on heating and spend about 0.6 percent of GDP extra on cooling.

Effects on Human Health

It is likely that a warmer world will lead to more heat-related deaths, but likewise it will certainly see a reduction in cold-related deaths. These figures on both sides vastly outweigh the numbers who might die as a result of any increase in vector-borne diseases (and see above on this also). Dr. Tol calculates that each 1°C rise in global temperature would, for example, reduce cold-related deaths in North America by 64,000 each year, while increasing heat-related deaths by 14,000, making a net gain of 50,000 fewer human beings dying prematurely each year (at a mean value of life of $2 million, which is low for figures in the economic literature,

this means a benefit to North America of $100 billion each year from a single degree of warming). Although India would see a large increase in deaths from heat-related respiratory causes and Africa and the Middle East would see small net increases in temperature-related deaths, the world would benefit in total. According to Dr. Tol's calculations, climate change would probably prevent half a million deaths around 2050. Although the sensitivities are highly uncertain, by the year 2200, "climate change may help to avoid almost 2.5 million premature deaths, but also cause an additional 1 million deaths."

TABLE 2
Number of Additional Deaths (1000s) Per ˚C Increase in Global Mean Temperature

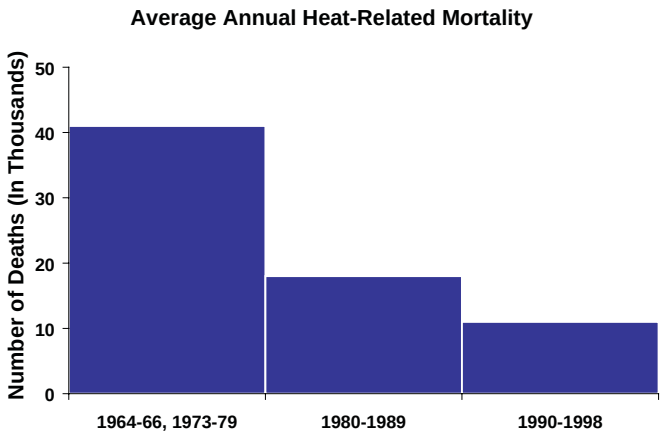
	Malaria	Schisto[a]	Dengue	C-Heat[b]	C-Cold[c]	Respiratory[d]	Total
OECD-A	0 (0)	0 (0)	0 (0)	11.4 (5.9)	-64.4 (4.4)	3.0 (9.7)	-50.0
OECD-E	0 (0)	0 (0)	0 (0)	11.7 (4.0)	-99.8 (2.6)	-2.8 (5.7)	-90.9
OECD-P	0 (0)	0 (0)	0 (0)	3.5 (2.8)	-13.1 (2.2)	1.0 (4.8)	-8.6
CEE&fSU	0 (0)	0 (0)	0 (0)	10.7 (4.4)	-87.5 (5.2)	4.5 (11.0)	-72.3
ME	0.2 (0.1)	-0.1 (0.0)	0 (0)	2.5 (0.4)	-8.9 (1.3)	9.9 (2.6)	3.6
LA	1.1 (0.8)	-0.1 (0.0)	0 (0)	8.1 (1.8)	-20.0 (3.5)	11.1 (7.0)	0.2
S&SEA	8.2 (5.9)	-0.1 (0.0)	6.7 (1.2)	17.5 (2.9)	-63.8 (16.9)	141.2 (34.1)	109.7
CPA	0 (0)	-0.1 (0.0)	0.4 (0.1)	24.3 (4.6)	-103.4 (21.7)	62.8 (44.4)	-16.0
AFR	56.5 (40.9)	-0.5 (0.1)	0.3 (0.1)	4.7 (0.5)	-18.2 (6.0)	24.8 (6.0)	68.3

[a] *Schistosomiasis*
[b] *Heat-related, cardiovascular mortality*
[c] *Cold-related, cardiovascular mortality*
[d] *Heat-related, respiratory mortality*

Source: TOL, 2002 (Part I).

We should also note that, in the United States, heat-related mortality has fallen as urban temperatures have risen:[39]

FIGURE 2
Average Annual Heat-Related Mortality



Source: World Climate Report, adapted from Davis et al. (2003).

It should therefore be apparent that global warming does offer considerable benefits if we can avoid its costs through adaptation measures, as described above. Working now to reduce the costs of hunger, water shortages, sea level rise, biodiversity threats and vector-borne diseases will allow us to see a world with more plant life, better agriculture, lower temperature-related energy costs and, most of all, far fewer premature deaths from cold.

THE VIRTUE OF RESILIENCY

The broader choice in climate-change policy is between measures which constrain economic choices and thereby hamper economic growth and innovation, and those measures which free up society's creative energies to spur innovation and enhance resiliency. The human impact on the global climate system will always be indeterminate to some degree. Unforeseen events, natural and human-induced, will occur. For these reasons, the best insurance policy is one that improves society's generalized ability to cope with disasters, environmental and otherwise, not simply to mitigate one potential disaster scenario that may or may not occur.

The importance of economic institutions in generating societal resiliency can be readily observed in the disparate impacts that natural disasters have on different parts of the world. Hurricane Katrina notwithstanding, a hurricane in Bangladesh or the Dominican Republic has a far more devastating effect than an equally severe hurricane in Florida or North Carolina. Much the same can be said when comparing the effects of earthquakes in Nicaragua and India on the one hand, and California on the other. While the economic damage may be greater in the US—representing the greater accumulation of wealth that can be affected—there is greater loss of life in poorer nations. As Indur Goklany observes, "Wealth alone can explain much of the variability in the vulnerability of societies to environmental and natural stresses: Just as a person afflicted with AIDS is less immune to infectious diseases, so is a poorer society more susceptible to such stresses." Insofar as poorer nations are more vulnerable to potential climatic changes, it is a function of their poverty and centralized economic institutions.

Moreover, in poorer nations the amount of time it takes to restore essential services and infrastructure is far greater. This is not only a function of disparities in wealth, but also a function of the added resiliency afforded by market economies which are more able to reallocate resources to distressed areas in times of need. Price signals and other market feedbacks send powerful signals to entrepreneurs, businesses, and merchants throughout the economy, leading to a greater provision of needed goods and services in those areas hit by a disaster. This response is far more rapid and efficient than that which can be provided through a centrally-planned system. Thus, the vulnerability due to the lack of wealth in developing nations is compounded by central control of their economies. Insofar as an emission-control regime restricts the dynamism of a market economy, it will also make that society more vulnerable to natural disturbances, regardless of whether they are man-made.

It is also important to consider that health is a function of standards of living; so too is environmental protection, though to a lesser extent. Wealthier *is* healthier, and richer *is* cleaner. Limiting economic activity therefore can have a dramatic impact on quality of life, not least by reducing life expectancy. Researchers have found a direct correlation between income and mortality, with a disproportionate impact on poorer communities.[40] Thus, policies that reduce societal wealth can be expected to induce premature mortalities, as well as to increase disease and injury rates. Studies indicate that aggregate economic losses as small as $4 million

Talking*Point:*

Policies that reduce societal wealth can be expected to induce premature mortalities, as well as to increase disease and injury rates.

can induce a premature mortality. Even assuming a conservative estimate of one premature mortality per $10 million in costs, emission-control policies, such as those envisioned by the Kyoto treaty, can have a devastating effect.[41]

For example, it is often asserted that global warming already kills 150,000 people per year worldwide. Yet a recent econometric study by Johns Hopkins epidemiologist Harvey Brenner[42] found that replacing U.S. coal with higher-cost fuels for the purposes of energy production would result in at least 195,000 additional premature deaths in the U.S. alone. Given that recent "Kyoto-lite" measures proposed in the U.S. Senate such as the *Climate Stewardship Act* proposed by Senators McCain (R-AZ) and Lieberman (D-CT) would result in the replacement of about 78 percent of coal with high-priced fuels, it is entirely plausible that even "baby steps" towards climate mitigation would kill more people in the U.S. than global warming kills worldwide. The effects of such strategies if adopted across the globe could be far more devastating than global warming even if alarmist predictions come true.

Talking*Point:*

Replacing U.S. coal with higher-cost fuels for the purpose of energy production would result in at least 195,000 additional premature deaths in the U.S. alone.

On the environmental side, national wealth also correlates with environmental protection. As already noted, wealthier economies tend to be more efficient, producing more output with fewer inputs and residuals. As countries develop, they reach a transition point at which they start getting cleaner. World Bank studies indicate that ambient concentrations of key air pollutants, such as particulate matter and sulfur dioxide, generally peak when per capita incomes reach $3,000-$4,000, and decline thereafter.[43] The transition point for fecal coliform in water is even lower, at less than $1,500 per capita. Thus, according to Goklany, "Anything that retards economic growth generally also retards environmental cleanup."

Increasing wealth can also impact emissions of greenhouse gases. For example, a study of developed nations conducted by the OECD found that between 1971 and 1988, each increase in per capita income of $1,000 correlated with a 3.5 percent decrease in carbon dioxide emissions per capita. The U.S. may be the greatest emitter of carbon dioxide, but it emits far less per unit of output than the comparatively poor and inefficient economies of India and China.

It is true that economic growth and technological advance pose environmental risks, including the risk of climate change. But regulatory policies that constrict energy use—the lifeblood of the modern economy—hardly constitute a safer course. By limiting economic growth, such policies inhibit the technological innovation and adaptive forces of the marketplace which represent the most powerful forms of insurance against uncertain threats.

Irrespective of whether the greatest environmental threat is anthropogenic greenhouse warming, a new ice age, or some other unforeseen natural calamity, society will be left best able to cope with these eventualities the less restricted its economic institutions. Freeing up key sectors of the economy, particularly those most reliant on energy, thus provides two forms of insurance: It spurs innovation in the energy sector, increasing energy efficiency and technological innovation, while also enhancing society's overall resiliency.

GLOBAL WARMING AND TEXAS

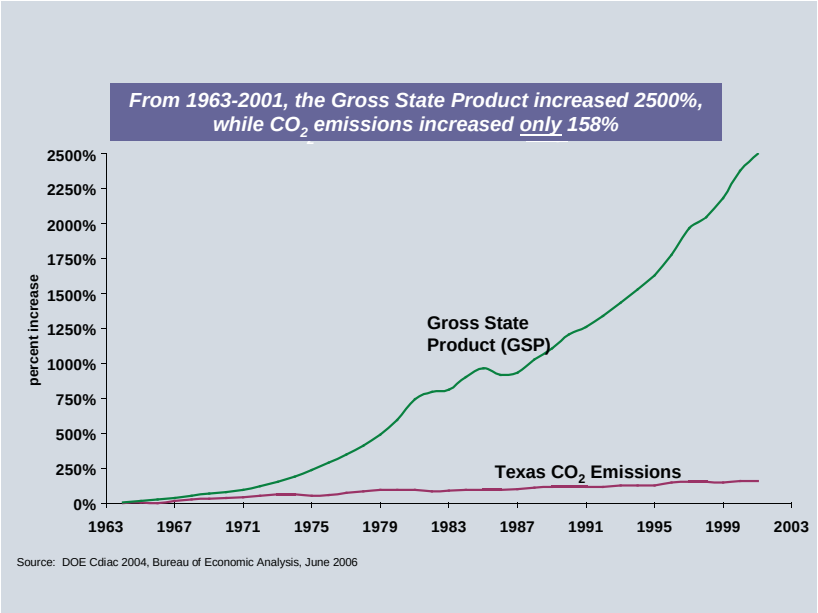
Current CO_2 emissions

In 2004, the U.S. Department of Energy ("DOE") published an analysis of the national trends in carbon dioxide (CO_2) emissions from fossil fuel use in the United States through

2001 on a state-by-state basis. The analysis included CO_2 emissions from virtually all sectors of the economy. In addition, the U.S. Department of Commerce Bureau of Economic Analysis (BEA) publishes data on the economic activities of the states expressed in terms of Gross Domestic Product (GDP) by state, which is a measure of economic well-being.[45] GDP by state data are available since 1963.

The figure below shows CO_2 emissions and GDP trends for Texas using the DOE and BEA data for Texas expressed as percent increase from 1963 through 2001. During this approximately four-decade period, emissions of CO_2 in Texas increased about 258 percent, from 286.1 million tons to 736.9 million tons. Remarkably, during the same timeframe, the economy of Texas, as measured by the GDP, grew by an enormous 2,600 percent, from $29.3 billion in 1963 to $762.2 billion in 2001. The 2005 GDP for Texas was $987.4 billion as the economy of Texas continues to grow.

FIGURE 3
Trend of CO_2 Emissions in Texas vs. Trend of Gross State Product for Texas



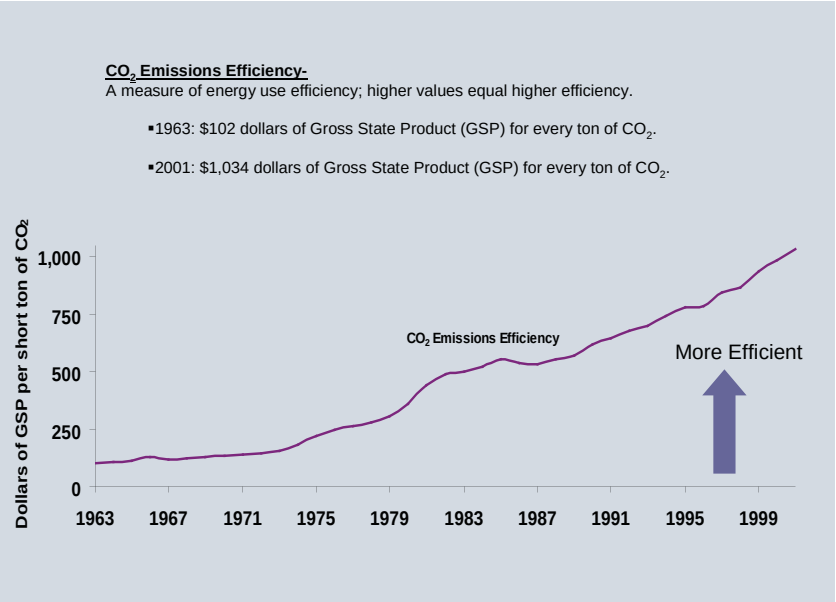
Source: DOE Cdiac 2004, Bureau of Economic Analysis, June 2006.

The figure shows the relationship between dollars of GDP and tons of CO_2 emissions in an expression of "carbon dioxide emissions efficiency," i.e., how many dollars of GDP were produced for every ton of CO_2 emitted in Texas.[46] In 1963, $102 of GDP was added to the Texas economy for every ton of CO_2 emitted from fossil fuel combustion in Texas. Between 1963 and 2001, the Texas economy became much more efficient so that by 2001, $1,034 of GDP was added to the Texas economy for every ton of CO_2 emitted. That means that CO_2 emissions efficiency in Texas increased by over 1,000 percent between 1963 and 2001.

Quick*Fact:*

CO_2 emissions efficiency in Texas increased by over 1,000 percent between 1963 and 2001.

FIGURE 4
Emissions Efficiency of CO_2 in Texas; Dollars of GSP per Ton of CO_2



Source: DOE Cdiac 2004, Bureau of Economic Analysis, June 2006.

QuickFact:

About 60 percent of the total petrochemicals produced in the United States are produced in Texas, and about 30 percent of the total gasoline and diesel refined in the United States is refined in Texas.

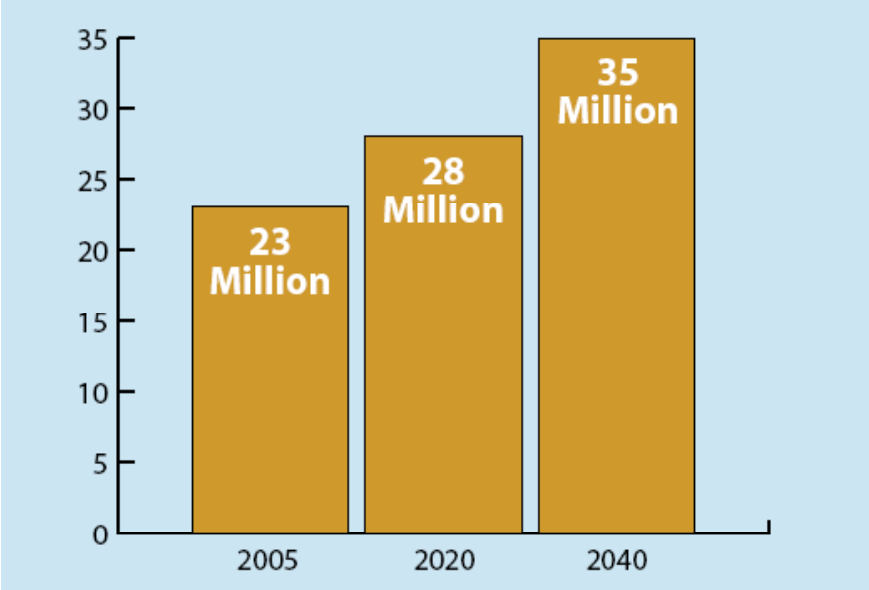
While it is true that CO_2 emissions in Texas are the largest in the United States and represent 11.8 percent of the total CO_2 emissions in the United States, this should not be surprising and should not be viewed as a negative because a significant percentage of critical products, the production of which results in CO_2 emissions, is produced in Texas. For example, about 60 percent (60%) of the total petrochemicals produced in the United States are produced in Texas, and about 30 percent (30%) of the total gasoline and diesel refined in the United States is refined in Texas.[47] In addition, Texas generates almost 10 percent (10%) of the total electricity generated in the United States.[48]

Future Demand

The population of Texas is projected to increase considerably over the next thirty years. This increase in population will drive increased demand for electric energy. The population increase comes not just from foreign immigration but from relocation of American citizens looking for a benign climate, while the increased electric demand comes at least in part from those relocating Americans factoring the existence of air conditioning into their relocation decisions.

This means that Texan electricity demand will rise 20 percent by 2015 and 43 percent by 2025 given current growth rates.[49] Meanwhile, the retirement and mothballing of current aging power plants reduces the supply available to meet that demand. The Electric Reliability Council of Texas (ERCOT) calculates that it may need between 50 and 100 new, large power plants by 2025 to meet the shortfall.

FIGURE 5
Texas' Projected Population Growth

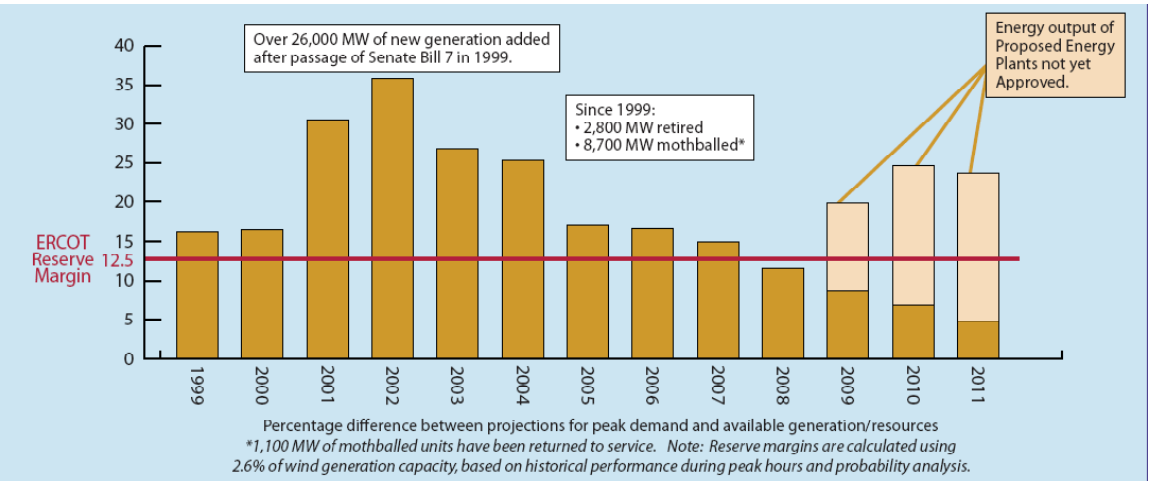


Source: Association of Electric Companies of Texas and the Texas State Data Center.

Coal as an affordable solution to the Texas demand problem

According to a study by Adam Rose and Dan Wei of Penn State,[50] coal will add more than $1 trillion to U.S. economic output by 2015 alongside up to 9 million jobs. In Texas specifically, they find that utilization of coal would add $46.4 billion in economic output, $16.4 billion in household income and an additional 289,500 jobs.

FIGURE 6
ERCOT Reserve Margins, 1999-2011



Source: Association of Electric Companies of Texas and the Texas State Data Center.

On the other hand, if Texas chooses to use more expensive fuel sources and power generation technologies, reducing coal use by 33 percent, it would cost the state a considerable amount: $6.2 billion in economic output, $5.2 billion in household income and a net loss of 47,500 jobs even after taking into account jobs gained in the industries utilizing more complex generating technologies.

Renewable Energy is No Answer

Even if wind power, solar power, and biomass power did not have the limitations discussed above, they could not provide the necessary electricity to meet the huge projected growth in the electricity needs of Texas. ERCOT estimates, based on estimated population growth and possible retirement of old fossil-fuel fired electric generating units, Texas may need up to 48,000 MW of additional peak electric generation capacity by 2015, and up to 79,000 MW of additional peak electric generation capacity by 2025. Based on the renewable portfolio standard goals for 2015 and 2025, the approximate increases in renewable energy between 2005 and 2015 would be less than 4,000 MW, and between 2005 and 2025 would be less than 9,000 MW—far below the additional peak electric generation capacities of 48,000 MW and 79,000 MW that ERCOT estimates may be needed in Texas by 2015 and 2025, respectively.

Energy Conservation Cannot Meet the Shortfall

Conservation measures such as building standards and efficiency standards for appliances and air conditioners could decrease the amount of electricity that would otherwise be used, and thus, the amount of CO2 emissions and other greenhouse gas emissions that would result from the generation of such electricity. However, even if such conservation measures were fully implemented, the amount of electricity that would be reduced because of them would be far out-paced by the amount of additional electricity that will be needed in Texas.

Based on the population growth figures and retirement of old electric generating units mentioned above, ERCOT estimates that Texas may need up to 66,000 MW of additional peak generation capacity by 2020, which would be an increase of about 85 percent (85%) from 2005. According to a June 2006 report by the environmental group U.S. Public Interest Research Group (U.S. PIRG), it is estimated that conservation measures may reduce electricity needed in the United States by about 28 percent (28%) by 2020. Even if that estimate is accurate for Texas, it would pale in comparison to the 85 percent (85%) increase in electricity that ERCOT estimates may be needed in Texas by 2020. Thus, while most electricity conservation measures should be encouraged, they will not prevent the need for any new electric generating units that use traditional fuels, much less support the shutdown of any existing electric generating units that use traditional fuels.

THE FAILURE OF KYOTO AND "CAP AND TRADE"

Europe

While America has opted out of the Kyoto Protocol process aimed at reducing greenhouse gas emissions, the European Union remains actively committed to the process. They have decided to implement Kyoto by means of an internal system known as "cap and trade." In this system, governments place a cap on emissions by industry, but also issue permits to industries representing their allowance to emit under the cap. Companies may then trade those permits—if a company is able to reduce its emissions below its limit it may sell the permits representing the shortfall to another

company that is having trouble meeting its target. Companies may also purchase credits from developing world organizations via a Kyoto scheme called the Clean Development Mechanism, in essence paying the developing world to reduce its emissions. While the trading system sounds sensible in theory, it has not worked well in practice.

Since 1997, the year the Kyoto Protocol was negotiated, EU emissions have increased. What is more, EU emissions are increasing faster than U.S. emissions. Since 2000, the EU increase has been almost double that of the U.S. (See Energy Information Administration). EU emissions are rising so rapidly that most EU countries are not on track to meet their Kyoto targets.

Open Europe, a British think tank, notes several "serious problems" with the EU Emission Trading Scheme (ETS):

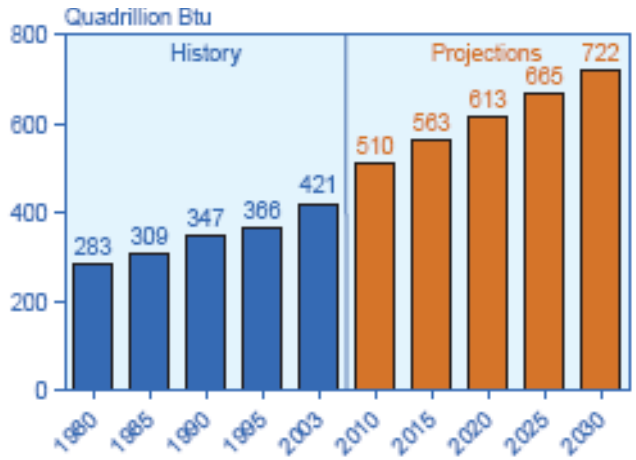
- ***Most countries game the system for competitive advantage.*** The UK chose tough targets based on past emissions as a baseline while other members gave their firms generous allowances based on projected future emissions. During 2005-2007, the system will transfer nearly £1.5 billion from UK firms to competitors in countries with weaker controls.
- ***The ETS is not reducing emissions.*** "According to figures released in June 2006, member states handed out permits for 1,829 million tons of CO_2 in 2005, while emissions were only 1,785 million tons… In other words, at present the system is simply not limiting emissions. Only four out of the 25 member states had targets which were lower than their actual emissions."
- ***The ETS enables Big Oil to profit at the expense of hospitals and schools.*** Instead of auctioning permits, member states handed out permits "free to individual firms based on a variety of rather sketchy criteria. This attempt at central planning has had all kinds of perverse results. For example NHS hospitals have been forced to spend a total of £1,300,000 buying up permits, and 18 UK universities are also net contributors. Ironically, large oil companies [e.g., British Petroleum] have made substantial profits under the scheme."
- ***Loose targets create an unstable market that discourages technological innovation.*** When firms realized in April 2006 that member states had set lax targets, permit prices fell from €30.50 per ton to just €9.25 per ton in one week. This kind of instability undermines firms' incentive to invest in carbon-reducing technologies.
- ***The system is a red tape nightmare for small entities.*** "Many small plants—for example the main boiler in a hospital—are covered by the scheme, and have to employ staff to conduct monitoring, compliance activities, and pay for official verification… such plants contribute little to total emissions." Public and private organizations in the UK pay an estimated £62 million per year in administrative expenses.

The World

Meanwhile, globally, demand for energy is growing apace, especially in developing countries. For example, the Energy Information Administration projects that global energy consumption will increase by 71 percent between 2003 and 2030, with non-OECD (Organization for Economic Cooperation and Development) countries accounting for three-quarters of the growth. In 2030, energy demand in non-OECD countries is projected to exceed that in OECD countries by 34 percent. Fossil fuels account for the lion's share of the increase in consumption (see figures below). This represents a huge challenge for global emissions reductions. Even if the EU, Japan, Canada and New Zealand meet their emissions reduction targets, those gains will be swamped by the mas-

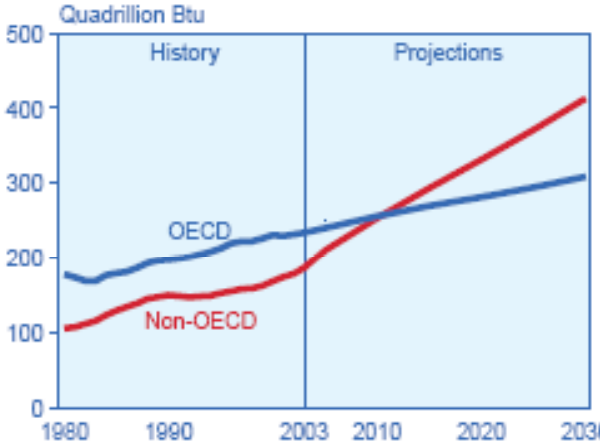
sive increase in emissions likely to come from the developing world. While many interests in the developing world might see means to profit by increased sales of emissions credits, they are not likely to accept the sort of stringent emissions reductions that will be required to stabilize emission concentrations at the sort of levels talked about by scientists.

FIGURE 7
World Marketed Energy Consumption, 1980-2030



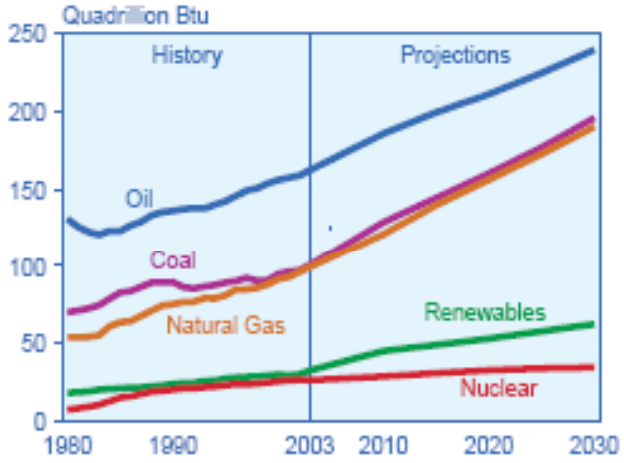
Source: Energy Information Administration (EIA); International Energy Annual 2003 (May-July 2005);www.eia.doe.gov/iea. Projections: EIA System for the Analysis of Global Energy Markets (2006).

FIGURE 8
World Marketed Energy Use: OECD and Non-OECD, 1980-2030



Source: Energy Information Administration (EIA); International Energy Annual 2003 (May-July 2005);www.eia.doe.gov/iea. Projections: EIA System for the Analysis of Global Energy Markets (2006).

FIGURE 9
World Marketed Energy Use by Fuel Type, 1980-2030



Source: Energy Information Administration (EIA); International Energy Annual 2003 (May-July 2005);www.eia.doe.gov/iea. Projections: EIA System for the Analysis of Global Energy Markets (2006).

EMISSIONS REDUCTIONS: WISE OR WASTEFUL?

This section is taken in its entirety from the testimony recently given by Professor Bjorn Lomborg of the Copenhagen Consensus Center to the US House of Representatives on March 21, 2007.[51] He told Congress:

"Global warming is not the only issue we need to tackle. This especially holds true for the third world. It is obvious that there are many other and more pressing issues for the third world, such as almost 4 million dying from malnutrition (underweight), 3 million from HIV/AIDS (unsafe sex), 2.5 million from indoor and outdoor air pollution, more than 2 million from lack of micronutrients (iron, zinc and vitamin A) and almost 2 million from lack of clean drinking water.

"Even if global warming exacerbates some or more of these problems, it is important to point out that the total magnitude of the problems is likely to far exceed the contribution from climate change. Thus, polices to reduce the total problems will have much more leverage than policies that only try to address the global warming part of the issues. Again, we have to ask if there are better ways to help than by cutting CO_2.

"We have to ask ourselves: what do we want to do first? Do we want to focus on cutting CO_2, at fairly high costs and doing fairly little good a hundred years from now? Or would we rather want to fix some of the many obvious problems in the world, where we could do a lot more good and do it now?

"In the so-called Copenhagen Consensus process, we asked this general question to some of the smartest economists in the world: where would you spend extra resources to do good first? Experts put forward their best solutions from climate change and communicable diseases, over conflicts, education, financial instability, governance & corruption, malnutrition and hunger, population: migration to sanitation & water and subsidies & trade barriers. But they didn't just say their proposals would do good—they said how much good they would do and how much they would cost.

"A panel of top-level economists, including four Nobel Laureates then made the first explicit global priority list ever, shown in Table 1. It divided the world's opportunities into very good, good, and fair according to how much more good they would do for each dollar spent, and bad opportunities where each dollar would do less than a dollar worth of good.

TABLE 3

	CHALLENGE	OPPORTUNITY
Very Good Opportunities	1-Diseases	Control of HIV/AIDS
	2-Malnutrition	Providing micro nutrients
	3-Subsidies & Trade	Trade liberalisation
	4-Diseases	Control of malaria
Good Opportunities	5-Malnutrition	Development of new agricultural technologies
	6-Sanitation & Water	Small-scale water technology for livelihoods
	7-Sanitation & Water	Community-managed water supply and sanitation
	8-Sanitation & Water	Research on water productivity in food production
	9-Government	Lowering the cost of starting a new business
Fair Opportunities	10-Migration	Lowering barriers to migration for skilled workers
	11-Malnutrition	Improving infant and child nutrition
	12-Malnutrition	Reducing prevalence of low birth weight
	13-Diseases	Scaled-up basic health services
Bad Opportunities	14-Migration	Guest worker programs for the unskilled
	15-Climate	Optimal carbon tax ($25-300)
	16-Climate	The Kyoto Protocol
	17-Climate	Value-at-risk carbon tax ($100-450)

"Preventing HIV/AIDS turns out to be the very best investment humanity can make – for each dollar it spends saving lives it will do about forty dollars worth of social good. For $27 billion, we can save 28 million lives over the coming years.

"Malnutrition kills almost 2.4 million lives each year. Perhaps even more dramatically, it affects more than half the world's population, by damaging eyesight, lowering IQ, reducing development and restricting human productivity. Investing $12 billion could probably half the incidence and death rate, with each dollar doing more than 30 dollars worth of social good.

"Ending first world agricultural subsidies and ensuring free trade would make almost everyone much better off. Models suggest that benefits of up to $2,400 billion annually would be achievable, which half of that benefit accruing to the third world. In achieving this, it would be necessary to bribe first world farmers, but the benefits of each dollar used would do more than fifteen dollars worth of social good.

"Finally, malaria kills more than a million each year. It infects about two billion people each year (many several times) and causes widespread debilitation. Yet, an investment of $13 billion could cut incidence by half, protect 90% of newborns, and cut deaths of under-5s by 72%.

"At the other end of the spectrum, the Nobels placed climate change opportunities, including Kyoto at the bottom under the heading 'bad opportunities,' underlining what we saw above, namely that for each dollar spent, we would end up doing much less than a dollar worth of good for the world.

"But the Copenhagen Consensus did not just ask top economists. We asked 80 young college students from all over the world, with 70% from developing countries, with equal gender representation, and from arts, sciences and social sciences. After five days independently inquiring the experts in all the areas, they came to a surprisingly similar result as the Nobels. They placed malnutrition and communicable diseases on top, climate change next to last.

"In 2006 we asked a wide range of UN ambassadors to make their priority list after two days of intensive debates. Besides the three biggest countries China, India and the US, countries as diverse as Angola, Australia, and Azerbaijan participated, along with Canada, Chile, Egypt, Iraq, Mexico, Nigeria, Poland, South Korea, Somalia, Tanzania, Vietnam, Zimbabwe and many others. They came out with a quite similar list, placing communicable diseases, clean drinking water and malnutrition at top, with climate change towards the bottom.

"This should make us stop and pause. None of these forums have said that climate change is not real or not important. But they ask us to consider, whether we would do better by addressing the real and pressing needs of current generations that we can solve so easily and cheaply, before we try to tackle the long-term problem of climate change where we can do so little for so much.

"To put it very bluntly, the Kyoto Protocol would likely cost at least $180 billion a year and do little good. UNICEF estimates that just $70-80 billion a year could give all Third World inhabitants access to the basics like health, education, water and sanitation. More important still is the fact that if we could muster such a massive investment in the present-day developing countries this would also give them a much better future position in terms of resources and infrastructure from which to manage a future global warming. What would we rather do first?

"I feel deeply—and I think we all feel deeply—that the development of global cooperation and solidarity is of fundamental importance today and into the future. But the prospect of a better world is best served when good hearts are joined by cool heads."

Talking*Point:*

Do we want to focus on cutting CO_2 at fairly high costs and doing fairly little good a hundred years from now? Or would we rather want to fix some of the many obvious problems in the world, where we could do a lot more good and do it now?

THE COST OF ACCOUNTING FOR THE SOCIAL COST OF CARBON

Economists are able to account for the social cost of carbon dioxide emissions, in other words, the economic value of the damages caused by global warming attributable to CO_2. There have been many studies with wildly varying results owing to the various uncertainties surrounding the topic and whether or not mankind's innate ability to adapt to and innovate away problems is taken into account.

Dr. Richard Tol reviewed these studies[52] and found that "the best guess for the marginal damage costs of carbon dioxide emissions is $5/tC" but that there were significant uncertainties. He concluded that it "is unlikely that the marginal damage costs of carbon dioxide emissions exceed $50/tC and are likely to be substantially smaller than that." One indicative smaller figure is $16, which represents the mean estimate of all the studies at a discount rate of 3 percent, which is consistent with how governments value future costs and benefits.

Another recent review for the UK Government, the "Stern Review," concluded that the marginal social cost per ton of CO_2 emissions was $85. As Dr. Tol's research reveals, this is actually an outlier in the literature and outside the mainstream of economic thought. Nevertheless, because the Stern Review has brought it into play, we should review it here.

It is valuable to know the social cost of carbon assuming that it is responsible for the effects of global warming, because that then gives us a guide as to how we could tackle the problem. The social costs actually represent damages inflicted on other people by our use of coal-generated electricity, for instance. Many economists believe that in order to account for those costs, governments should levy a tax—called a Pigou Tax after its inventor—to deter or at least bring home to people the cost of their activity.

How big would a Pigou Tax have to be to account for the social cost of household electricity use in Texas? We know that 1 MWh (megawatt hour) of coal-fired electricity use produces 0.95 metric tons of CO_2[53] which means that the following taxes would need to be levied per Kilowatt hour (KWh) of electricity used, depending on the social cost of carbon used:

Cost of Carbon	Tax
$85	8 cents
$50	4.8 cents
$16	1.5 cents
$5	0.5 cents

We also know that, according to the 2001 census, households in Texas use about 14,360 KWh of electricity each year, compared with the national average of 10,660 KWh (mostly due to the extra air conditioning).[54] This means that each Texas household would see its energy expenses increase by the following amounts according to which social cost of carbon is used:

Cost of Carbon	Extra Annual Expense
$85	$1,149
$50	$682
$16	$215
$5	$72

For a Texas family on median income ($41,645[55]), the extra burden of energy taxation at the level implied by the Stern Review would represent a loss of about 3 percent of total household income, an unconscionable rise in taxation that would need to be offset with other taxation reductions elsewhere and consequent elimination of social programs. Taxation rises at the more realistic estimates of social cost, however, are unlikely to affect consumer behavior. A $6 rise in the monthly electricity bill would probably be absorbed with offsetting domestic savings elsewhere, something that is also probably true with a monthly rise of $18.

The effectiveness in Pigou taxation in reducing electricity use and therefore carbon emissions must therefore be questioned. Levels of taxation sufficient to reduce energy use are

quite high and would represent a bar to economic activity. Smaller levels of taxation are, however, unlikely to lead to emissions reductions at all. Nor would it make sense to pick a "middle" level—this debate must be informed by the actual social cost of carbon emissions if it is to have any meaning at all.

Given that the true "external" cost of carbon use—all the damages it causes throughout the time the carbon remains in the atmosphere—is actually likely to be quite small, we should ask whether it is worth implementing Pigou taxation at all. British economist Arthur Seldon said of externalities in his Everyman's Dictionary of Economics:[56]

> *"Almost all economic activities, private or governmental, have external effects, and attempts to prevent, or calculate and compensate for them would probably make the economy seize up. In many instances, the effort to prevent or control them may be more costly than their effects, and it may be better to tolerate some of them as unavoidable consequences of human fallibility."*

Of course, as we have seen, the consequences of global warming can be sharply reduced by adaptation. If this is the case, the social costs of carbon use will fall much further and attempting to account for them is likely to be more costly than the social cost itself.

CONCLUSION

This paper has made the following findings:

- The global warming debate is subject to obfuscation and misrepresentation.
- Significant uncertainties remain in basic areas of climate science.
- The benefits of affordable energy to Texas, the U.S., and the world are immense.
- Emissions reductions are not the best way to tackle the potential damages of global warming.
- Global warming is not all downside.
- Resilient societies are wealthier, healthier, and cleaner.
- Texas requires greater energy capacity to meet its demand or it will suffer hardship.
- Cap and trade schemes are failing where they are being tried.
- Spending money on global warming is actually a bad investment.
- Even accounting for the cost of carbon emissions is imprudent.

Most states, including Texas, are properly deferring to the lead of the federal government in addressing greenhouse gas emissions and the possible impact of such emissions on climate change, since climate change is a global, rather than a state, issue. Some states, however, have taken it upon themselves to enact legislation and set targets to limit the emissions of greenhouse gases generated within their jurisdictions. Deferral to the lead of the federal government relative to addressing greenhouse gas emissions and their possible impact on climate change is appropriate for several reasons. Significant uncertainties remain in basic areas of climate science, and the cataclysmic consequences of climate change appear to be overstated. In addition, no individual state, or even groups of states, can have real or meaningful impact on climate change, even if greenhouse gas emissions from the state or groups of states were totally eliminated. Moreover, attempts to reduce greenhouse gas emissions by individual states, or groups of states, will adversely impact the economies of those states.

Texas has already considered whether greenhouse gases should be regulated. In response to a rulemaking petition filed with the Texas Commission on Environmental Quality (TCEQ) by several environmental groups, TCEQ conducted a year-long study of the issues. Ultimately, TCEQ concluded that climate change is a global issue and any response would necessarily require the cooperation of the nations of the world.[57] TCEQ correctly decided that the most prudent approach for Texas was to defer to the federal government's lead, and that this was consistent with current statutory requirements.[58] TCEQ noted that it does not have the technical staff to develop a regulatory program to control an international issue, that the federal government has the expertise and is actively working on the issue, and that Texas would take action consistent with any nationally developed greenhouse gas program.[59]

The state of Texas should therefore concentrate on planning to meet its demands for electricity and on growing the state's resiliency. Any other approach will put Texans' incomes, jobs and health at risk, all for no discernable gain in emissions reduction.

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(2) stratospheric changes, including depletion of ozone; and
(3) climate changes, including global warming.
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About this Report

As Texas electricity prices have climbed alongside natural gas prices, how to achieve affordable yet reliable energy is a highly debated topic. The market has responded to high prices with plans for new coal-fired and nuclear generation facilities. As many as 19 new coal-fired plants have been under consideration. Perhaps the harshest critics of new coal-fired generation in Texas comes from those concerned about global warming. The number of bills filed in the Texas Legislature testifies to the heightened interest and debate.

However, efforts to reduce CO_2 emissions would be disastrous to Texas bustling economy. By examining proposals to tax CO_2 emissions, this study determines that such efforts could cost Texas families up to $1,149 per year in extra electricity costs.

This paper takes a look at the entire debate over global warming, placing it in the context of the policy debate in Texas.

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