

**REPORT TO  
SHAREHOLDERS ON  
CLIMATE CHANGE**

September 2008

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## Introduction

What will history say about the first real climate change debate on the Senate floor? Was the debate about melting glaciers, ferocious hurricanes and devastating droughts? Or was it about everyday pocketbook issues, such as \$4 per gallon gas, jobs and overseas competition?

The fact that America's Climate Security Act of 2007, sponsored by Senators Joseph Lieberman (I-CT) and John Warner (R-VA) ("Lieberman-Warner"), failed to muster the 60 votes necessary to invoke cloture was no surprise. The bill, which Duke Energy opposed, was fundamentally flawed and would – if enacted – place an unfair burden on customers of the 25 states that rely on coal for more than half its electric generation.

The 48 senators who were willing to continue the debate did not represent support for the bill as written. Many of them had amendments in hand that would have significantly changed the bill. More telling, in fact, was a letter delivered immediately after the vote and signed by 10 Senate Democrats expressing support for climate legislation<sup>1</sup> - with appropriate cost containment safeguards.

We believe the principles espoused in this letter, which we are including in this report, provide the ingredients for an agreement that can overcome both the regional and political challenges of the climate debate. Duke Energy supports these principles and will continue to work with these senators and other policymakers who are committed to crafting a bill that achieves both our environmental and economic goals.

Also interesting about the Senate floor debate was what wasn't discussed. The lack of discussion over the science of climate change was notable only because previous debates featured dueling views of where the Earth's climate was headed. While the most recent report from the Intergovernmental Panel on Climate Change (IPCC), which we will discuss later in this report, may have helped to settle the scientific debate, we believe it is more likely many of the skeptics temporarily abandoned that tactic in order to focus on the obvious economic flaws of the legislation.

So what will history record about the June 2008 Senate floor debate? What was it about and what lessons did it provide?

First, the debate reinforced our view that passage of climate legislation is very likely. The November elections are likely to result in the election of even more climate supporters and both presidential candidates are committed to passing a bill.

Second, the debate clearly showed that Congress is sensitive to costs. While the climate challenge is recognized as real, legislators are acutely aware of the need to keep costs contained. We also believe the argument has been made successfully that coal needs to remain in America's generation mix. A case has been made that a "dash to gas" would be bad public policy.

Third, Congress more fully recognizes the need to develop, demonstrate and commercialize new clean coal technologies to begin decarbonizing our economy. In the wake of the defeat of Boxer-Lieberman-Warner, new bills were introduced to encourage acceleration of these technologies, specifically carbon capture and storage (CCS).

And fourth, although there was much discussion and concern about the growing carbon emissions of developing countries like China and India, there appeared to be bipartisan recognition of the need for America to lead in addressing this issue.

Duke Energy remains committed to working with Congress and the next Administration on climate legislation that begins to first slow, stop and then reverse the growth of carbon emissions into the atmosphere.

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<sup>1</sup> See Attachment A hereto.

We support an allocation formula that grants enough allowances to Local Electric Distributions companies so as to mitigate the most dramatic electricity prices increases – in regulated cost-of-service states this will be based on historical emissions. A policy that enacts a 100 percent allowance auction unfairly asks our customers to pay twice and substantially increases costs.

We support liberal use of verifiable offsets, again to reduce costs. Offsets are particularly important in the early years of a program, when new technology is not yet available.

We support an expanded federal role in bringing new clean coal technologies – particularly carbon capture and storage – to market as quickly as possible. Legislation also needs to address the regulatory, legal and financial impediments for widespread deployment of CCS technology.

We support long-term extension of the production tax credit for renewables. We support upgrades to the transmission grid to more effectively utilize the nation’s extensive wind capacity.

We support a national commitment to energy efficiency, which we call the “fifth fuel” – a commitment that should include appropriate incentives for both consumers and providers of this resource.

And, we support nuclear power. No serious effort to decarbonize America’s electric supply can fail to include plans to bring a new line of safe, secure nuclear plants into the nation’s generation portfolio.

Analysis repeatedly shows that in order to meet the long-term targets likely to be imposed that all technologies and energy sources must be used – coal, natural gas, renewables, nuclear and energy efficiency.

This report has been prepared at the request of a Duke Energy shareholder – the Free Enterprise Action Fund, which has posed several questions to the company with respect to the science, costs and objectives of climate legislation. The report has been authorized by the Corporate Governance Committee of the Duke Board of Directors.

We thank you for your interest.

John Stowell  
Vice President  
Environmental, Health and Safety Policy

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## Duke Energy Greenhouse Gas Emissions

Duke Energy's greenhouse gas (GHG) emissions come primarily from the burning of fossil fuels – primarily coal – in the company's power plants. The company's other greenhouse gas emissions include methane releases from its natural gas distribution operations, SF6 from the operation of its transmission and distribution system and carbon dioxide from various mobile vehicles. Relative to the emissions from its power plants, these other emissions are de minimus.

Duke Energy will report to the Carbon Disclosure Project this fall that its global emissions for calendar year 2007 were 103.6 million metric tonnes CO<sub>2</sub>e, of which 100.8 million metric tonnes were emitted from its United States operations. These are direct emissions; the company does not report indirect emissions.

More information on Duke Energy's air emissions is available at: [www.duke-energy.com/environment/air-quality.asp](http://www.duke-energy.com/environment/air-quality.asp). The company's filing with the Carbon Disclosure Project, covering 2007 emissions and fuel consumption, will be available in September at: [www.cdproject.net](http://www.cdproject.net).

## The Science of Climate Change

Duke Energy's position in the climate change debate reflects our acceptance of the synthesis of the peer-reviewed scientific literature provided by the United Nations' Intergovernmental Panel on Climate Change. More than 3,000 scientists participated in the latest IPCC review, which was published last year, and is available on the web at: <http://www.ipcc.ch>.

The IPCC is a scientific review body created by the World Meteorological Organization and the United Nations Environment Program, assigned to report the state of scientific knowledge on climate change in regular intervals. The IPCC defines climate change as:

“...a statistically significant variation in either the mean state of the climate or in its variability, persisting for an extended period (typically decades or longer). Climate change may be due to natural internal processes or external forcings, or to persistent anthropogenic changes in the composition of the atmosphere or in land use.”

The IPCC's Fourth Assessment Report contains several key findings that have been peer reviewed and published, concerning both the effects and potential causes of climate change. The panel concluded that:

- Eleven of the last twelve years (1995-2006) rank among the twelve warmest years since 1850, when regular scientific measurement of global surface temperatures began. “Warming of the climate system,” the report says, “is unequivocal.”
- Satellite data since 1978 show that annual average Arctic sea ice extent has shrunk by 2.7 percent per decade.
- Global average sea level has risen since 1961 at an average of 1.8 mm/yr. and, since 1993, at an average of 3.1 mm/yr. with contributions from thermal expansion, melting glaciers and ice caps and the polar ice sheets.
- Global GHG emissions due to human activities have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004.
- The increases in these GHG concentrations are due primarily to fossil fuel use, with land use change providing another significant, but smaller, contribution.
- Continued GHG emissions at or above current rates would cause further warming and induce many changes in the global climate system during the 21<sup>st</sup> Century that would very likely be larger than those observed during the 20<sup>th</sup> Century.

Based on its evaluation of the science since its Third Assessment Report in 2001, the IPCC was more certain that human activities were influencing the Earth's climate. Using a standard of measurement to express that likelihood, the IPCC review found:

- It was very likely (greater than a 90 percent probability) that sea level rise during the latter half of the 20<sup>th</sup> Century was attributed to global warming and human activities contributed to that warming.
- It was likely (greater than a 66 percent probability) that human influences have contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns.
- It is likely they have caused increased temperatures of extreme hot nights, cold nights and cold days.
- More likely than not (greater than a 50 percent probability) that the increased risk of heat waves, regional drought and extreme regional heavy precipitation since the 1970s is caused by human-contributed climate change.

The IPCC Report does say there are still scientific uncertainties that remain to be explored and better understood. Among them are questions relating to impact of cloud cover, how climate change may be expressed regionally, a more complete picture of the observed natural response to anthropogenic warming, and the apparent variability of the ocean carbon feedback ability.

The IPCC is not alone in its view of the science.

The National Science and Technology Council's Committee on Environment and Natural Resources published its own report and among its many findings found:

*Global averaged concentration of carbon dioxide in the atmosphere has increased from about 280 parts per million in the 18<sup>th</sup> Century to 383 parts per million in 2007. Current atmospheric concentration of carbon dioxide greatly exceeds the natural range of the last 650,000 years (180 to 300 parts per million) as determined from ice cores.<sup>2</sup>*

And, in a report published by the U.S. Department of Agriculture (USDA), the government finds that increased temperatures from climate change are already having an impact. In the report entitled "The Effects of Climate Change on Agriculture, Land Resources, Water Resources and Biodiversity," USDA says:

As temperature rises, crops will increasingly experience temperatures above the optimum for their reproductive development, and animal production of meat or dairy products will be impacted by temperature extremes. Management of Western reservoir systems is very likely to become more challenging as runoff patterns continue to change.<sup>3</sup>

Finally, the contention that human emissions of GHGs are contributing to climate change is supported by the National Academies of Science (or their equivalent) of the following countries<sup>4</sup>: Brazil, Canada, China, France, Germany, India, Italy, Japan, Russia, United Kingdom, and the United States.

Certainly, there remains some controversy regarding climate change. However, among those scientists actively working and publishing in the legitimate scientific journals, there is very little debate around the basic points that the earth is warming and that increasing concentrations of GHGs are largely (not exclusively) responsible. One of the oft-repeated frustrations by the most prominent scientific experts in this field is opponents' use of non-peer reviewed scientific material to bolster their arguments. The science community has expressed dismay that, often, these claims are afforded the same treatment by the mainstream media, which is intent on reporting all sides of a story.

We do not claim to be experts on the science of climate change but we take our cue from the peer-reviewed science as synthesized and reported by the IPCC. We acknowledge that climate change is occurring and that human interaction with the environment is responsible for much of it. We also acknowledge a responsibility to engage our policymakers in a solution-oriented approach as quickly as possible.

The shareholders who asked us to produce this report have asked us why we cannot precisely calculate the impact Duke Energy's actions are having on global temperatures, and in turn what impact those changes might cause. A ton of carbon dioxide emitted from any source, whether one of our power plants in Indiana or from a burning forest, has an almost immeasurable impact on global CO<sub>2</sub> concentrations. Therefore, the actions of any single emitter acting alone will have zero impact. It is only with enactment of regulations in the largest emitting countries to reduce **total** CO<sub>2</sub> emissions that we will avoid a future with even higher GHG concentrations than today. Climate change is a global problem that requires a global answer.

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<sup>2</sup> See <http://www.ostp.gov>

<sup>3</sup> See [http://www.usda.gov/oce/global\\_change/files/SAP4\\_3/ExecSummary.pdf](http://www.usda.gov/oce/global_change/files/SAP4_3/ExecSummary.pdf)

<sup>4</sup> See <http://www.nationalacademies.org/onpi/06072005.pdf>

## Alternative Climate Views

Skepticism is an important part of the scientific process. In challenging conventional thinking, it tests both hypothesis and theory, giving energy and credibility to the consensus that emerges.

Although we noted little, if any, debate on the Senate floor this past June on the science of climate change, there remains, certainly, an active and vocal skeptics community, whose views can be readily found on the Internet and, sometimes, in the mainstream press. Duke Energy has followed their arguments closely and will continue to do so. But, our policy positions are driven by the IPCC peer-reviewed science and by our judgment that this science is not only credible, but that it is accepted by the vast majority of public policymakers who will shape U.S. climate legislation in the years to come.

We view our engagement in the climate debate as a pragmatic response to both scientific and political reality. Our approach is predicated on the responsibility we feel to contribute positively to the public discourse and reduce the risks to our customers, shareholders and communities.

The Free Enterprise Action Fund asked us to specifically address the scientific arguments put forward by those who dispute climate change theory. As they did not specify which of the many arguments one can find on the internet, we have relied on the following BBC article by Richard Black.

### **BBC NEWS**

#### **Climate scepticism: The top 10**

**What are some of the reasons why "climate sceptics" dispute the evidence that human activities such as industrial emissions of greenhouse gases and deforestation are bringing potentially dangerous changes to the Earth's climate?**

As the Intergovernmental Panel on Climate Change (IPCC) finalises its landmark report for 2007, we look at 10 of the arguments most often made against the IPCC consensus, and some of the counter-arguments made by scientists who agree with the IPCC.

#### **1. EVIDENCE THAT THE EARTH'S TEMPERATURE IS GETTING WARMER IS UNCLEAR**

##### **Sceptic**

Instruments show there has been some warming of the Earth's surface since 1979, but the actual value is subject to large errors. Most long-term data comes from surface weather stations. Many of these are in urban centres which have expanded in both size and energy use. When these stations observe a temperature rise, they are simply measuring the "urban heat island effect". In addition, coverage is patchy, with some regions of the world almost devoid of instruments. Data going back further than a century or two is derived from "proxy" indicators such as tree-rings and stalactites which, again, are subject to large errors.

##### **Counter**

Warming is unequivocal. Weather stations, ocean measurements, decreases in snow cover, reductions in Arctic sea ice, longer growing seasons, balloon measurements, boreholes and satellites all show results consistent with the surface record of warming. The urban heat island effect is real but small; and it has been studied and corrected for. Analyses by NASA for example use only rural stations to calculate trends. Recently, work has shown that if you analyse long-term global temperature rise for windy days and calm days separately, there is no difference. If the urban heat island effect were large, you would expect to see a bigger trend for calm days when more of the heat stays in the city. Furthermore, the pattern of warming globally doesn't resemble the pattern of urbanisation, with the greatest warming seen in the Arctic and northern high latitudes. Globally, there is a warming trend of about 0.8C since 1900, more than half of which has occurred since 1979.<sup>5</sup>

<sup>5</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-3.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-3.1.html)

## 2. IF THE AVERAGE TEMPERATURE WAS RISING, IT HAS NOW STOPPED

### Sceptic

Since 1998 - almost a decade - the record, as determined by observations from satellites and balloon radiosondes, shows no warming.

### Counter

1998 was an exceptionally warm year because of the strong El Niño event. Variability from year to year is expected, and picking a specific warm year to start an analysis is "cherry-picking"; if you picked 1997 or 1999 you would see a sharper rise. Even so, the linear trends since 1998 are still positive.<sup>6</sup>

## 3. THE EARTH HAS BEEN WARMER IN THE RECENT PAST

### Sceptic

The beginning of the last Millennium saw a "Mediaeval Warm Period" when temperatures, certainly in Europe, were higher than they are now. Grapes grew in northern England. Ice-bound mountain passes opened in the Alps. The Arctic was warmer in the 1930s than it is today.

### Counter

There have been many periods in Earth history that were warmer than today - if not the MWP, then maybe the last interglacial (125,000 years ago) or the Pliocene (three million years ago). Whether those variations were caused by solar forcing, the Earth's orbital wobbles or continental configurations, none of those causes apply today. Evidence for a Mediaeval Warm Period outside Europe is patchy at best, and is often not contemporary with the warmth in Europe. As the US National Oceanographic and Atmospheric Administration (NOAA) puts it: "The idea of a global or hemispheric Mediaeval Warm Period that was warmer than today has turned out to be incorrect". Additionally, although the Arctic was warmer in the 1930s than in the following few decades, it is now warmer still.<sup>7</sup>

## 4. COMPUTER MODELS ARE NOT RELIABLE

### Sceptic

Computer models are the main way of forecasting future climate change. But despite decades of development they are unable to model all the processes involved; for example, the influence of clouds, the distribution of water vapour, the impact of warm seawater on ice-shelves and the response of plants to changes in water supply. Climate models follow the old maxim of "garbage in, garbage out".

### Counter

Models are simply ways to quantify understanding of climate. They will never be perfect and they will never be able to forecast the future exactly. However, models are tested and validated against all sorts of data. Over the last 20 years they have become able to simulate more physical, chemical and biological processes, and work on smaller spatial scales. The 2007 IPCC report produced regional climate projections in detail that would have been impossible in its 2001 assessment. All of the robust results from modeling have both theoretical and observational support.<sup>8</sup>

## 5. THE ATMOSPHERE IS NOT BEHAVING AS MODELS WOULD PREDICT

### Sceptic

Computer models predict that the lower levels of the atmosphere, the troposphere, should be warming faster than the Earth's surface. Measurements show the opposite. So either this is another failing of the models, or one set of measurements is flawed, or there are holes in our understanding of the science.

### Counter

Lower levels of the troposphere are warming; but measuring the exact rate has been an uncertain process, particularly in the satellite era (since 1979). Readings from different satellites need to be tied together, and each has its own problems with orbital decay and sensor drift. Two separate analyses show consistent warming, one faster than the surface and one slightly less. Within the uncertainties of the data, there is no discrepancy that needs to be dealt with. Information from balloons has its own problems but the IPCC concluded this year: "For the period since 1958, overall global and tropical tropospheric warming estimated from radiosondes has slightly exceeded surface warming".<sup>9</sup>

<sup>6</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-3.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-3.1.html) and [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-9.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-9.1.html)

<sup>7</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-6.2.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-6.2.html) and [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-6.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-6.1.html)

<sup>8</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-8.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-8.1.html)

<sup>9</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-3.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-3.1.html) and Thorne, P. W., D. E. Parker, B. D. Santer, M. P. McCarthy, D. M. H. Sexton, M. J. Webb, J. M. Murphy, M. Collins, H. A. Titchner, and G. S. Jones (2007), Tropical vertical temperature trends: A real discrepancy?, *Geophys. Res. Lett.*, 34, L16702, doi:10.1029/2007GL029875.

## 6. CLIMATE IS MAINLY INFLUENCED BY THE SUN

### Sceptic

Earth history shows climate has regularly responded to cyclical changes in the Sun's energy output. Any warming we see can be attributed mainly to variations in the Sun's magnetic field and solar wind.

### Counter

Solar variations do affect climate, but they are not the only factor. As there has been no positive trend in any solar index since the 1960s (and possibly a small negative trend), solar forcing cannot be responsible for the recent temperature trends. The difference between the solar minimum and solar maximum over the 11-year solar cycle is 10 times smaller than the effect of greenhouse gases over the same interval.<sup>10</sup>

## 7. A CARBON DIOXIDE RISE HAS ALWAYS COME AFTER A TEMPERATURE INCREASE NOT BEFORE

### Sceptic

Ice-cores dating back nearly one million years show a pattern of temperature and CO<sub>2</sub> rise at roughly 100,000-year intervals. But the CO<sub>2</sub> rise has always come after the temperature rise, not before, presumably as warmer temperatures have liberated the gas from oceans.

### Counter

This is largely true, but largely irrelevant. Ancient ice-cores do show CO<sub>2</sub> rising after temperature by a few hundred years - a timescale associated with the ocean response to atmospheric changes mainly driven by wobbles in the Earth's orbit. However, the situation today is dramatically different. The extra CO<sub>2</sub> in the atmosphere (35% increase over pre-industrial levels) is from human emissions. Levels are higher than have been seen in 650,000 years of ice-core records, and are possibly higher than any time since three million years ago.<sup>11</sup>

## 8. LONG-TERM DATA ON HURRICANES AND ARCTIC ICE IS TOO POOR TO ASSESS TRENDS

### Sceptic

Before the era of satellite observation began in the 1970s, measurements were ad-hoc and haphazard. Hurricanes would be reported only if they hit land or shipping. Arctic ice extent was measured only during expeditions. The satellite record for these phenomena is too short to justify claims that hurricanes are becoming stronger or more frequent, or that there is anything exceptional about the apparent shrinkage in Arctic ice.

### Counter

The Arctic Climate Impact Assessment project notes that systematic collection of data in parts of the Arctic began in the late 18th Century. The US National Hurricane Center notes that "organised reconnaissance" for Atlantic storms began in 1944. So although historical data is not as complete as one might like, conclusions can be drawn. And the IPCC does not claim that global warming will make hurricanes more frequent - its 2007 report says that if anything, they are likely to become less frequent, but more intense.<sup>12</sup>

## 9. WATER VAPOUR IS THE MAJOR GREENHOUSE GAS; CO<sub>2</sub> IS RELATIVELY UNIMPORTANT

### Sceptic

The natural greenhouse effect keeps the Earth's surface about 33C warmer than it would otherwise be. Water vapour is the most important greenhouse gas, accounting for about 98% of all warming. So changes in carbon dioxide or methane concentrations would have a relatively small impact. Water vapour concentrations are rising, but this does not necessarily increase warming - it depends how the water vapour is distributed.

### Counter

Water vapour is essentially in balance with the planet's temperature on annual timescales and longer, whereas trace greenhouse gases such as CO<sub>2</sub> stay in the atmosphere on a timescale of decades to centuries. The statement that water vapour is "98% of the greenhouse effect" is simply false. In fact, it does about 50% of the work; clouds add another 25%, with CO<sub>2</sub> and the other greenhouse gases contributing the remaining quarter. Water vapour concentrations are increasing in response to rising temperatures, and there is evidence that this is adding to warming, for example in Europe. The fact that water vapour is a feedback is included in all climate models.<sup>13</sup>

<sup>10</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-9.2.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-9.2.html) and [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-2.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-2.1.html)

<sup>11</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-7.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-7.1.html) and [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-2.1.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-2.1.html)

<sup>12</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-3.3.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-3.3.html)

<sup>13</sup> See [http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1\\_faq-1.3.html](http://ipcc-wg1.ucar.edu/wg1/FAQ/wg1_faq-1.3.html)

## 10. PROBLEMS SUCH AS HIV/AIDS AND POVERTY ARE MORE PRESSING THAN CLIMATE CHANGE

### Sceptic

The Kyoto Protocol will not reduce emissions of greenhouse gases noticeably. The targets were too low, applied only to certain countries, and have been rendered meaningless by loopholes. Many governments that enthuse about the treaty are not going to meet the reduction targets that they signed up to. Even if it is real, man-made climate change is just one problem among many facing the world's rich and poor alike. Governments and societies should respond proportionately, not pretend that climate is a special case. And some economists believe that a warmer climate would, on balance, improve lives.

### Counter

Arguments over the Kyoto Protocol are outside the realms of science, although it certainly will not reduce greenhouse gas emissions as far or as fast as the IPCC indicates is necessary. The latest IPCC Working Group 2 report suggests that the impact of man-made climate change will on balance be deleterious, particular to the poorer countries of the tropics, although colder regions may see benefits such as increased crop yields. Investment in energy efficiency, new energy technologies and renewables are likely to benefit the developing world.

*Compiled with advice from Fred Singer and Gavin Schmidt*

Story from BBC NEWS:

[http://news.bbc.co.uk/go/pr/fr/-/2/hi/in\\_depth/629/629/7074601.stm](http://news.bbc.co.uk/go/pr/fr/-/2/hi/in_depth/629/629/7074601.stm)

Published: 2007/11/12 11:55:00 GMT

© BBC MMVIII

Duke Energy is aware of the claim that the IPCC does not adequately represent the diversity of views of dissenting scientists. Opponents of the IPCC and climate science in general frequently cite the results of the Oregon Institute of Science and Medicine's (OISM) petition project<sup>14</sup> to refute the "scientific consensus." The petition, disputing the theory of anthropogenic climate change and signed by over 31,000 scientists, was launched primarily in opposition to the Kyoto Protocol.

We note, however, that very few of the signatories are involved in climate research. The petition's conclusions are supported by a review article disputing the evidence of climate change that was published in the *Journal of American Physicians and Surgeons* (2007). This journal is a publication of the Association of American Physicians and Surgeons (AAPS). AAPS was formed in 1943 to oppose government funded healthcare and its executive director is one of the six staff members of OISM. Our research shows that the journal is not listed by MedLine/PubMed<sup>15</sup> despite having been reviewed by them as recently as 2004.<sup>16</sup> Of equal concern, the publication does not appear in searches of Journal Citation Reports<sup>17</sup> using the ISI Web of Knowledge, in part because it is not listed in the ISI Index. Among the criteria for inclusion in the index (which covers over 9000 peer reviewed publications) is a determination "of the journal's citation history and or the citation history of its authors and editors" – this is a metric to gauge the influence of the publication within the scientific community.

The article has been very influential among many scientists not involved in climate research and undoubtedly encouraged many of them to sign the anti-Kyoto petition. However, it is not taken seriously by those conducting climate research who publish their findings in accepted peer reviewed journals. Therefore, neither the article nor the resulting petition can be taken as a valid refutation of the generally accepted scientific view of climate science as presented by the IPCC.

<sup>14</sup> See <http://www.oism.org/pproject/>

<sup>15</sup> See <http://www.nlm.nih.gov/pubs/factsheets/jsel.html>

<sup>16</sup> See [http://www.nlm.nih.gov/archive/20060816/istrccommittee/jun04/jun04\\_titles\\_scheduled.html](http://www.nlm.nih.gov/archive/20060816/istrccommittee/jun04/jun04_titles_scheduled.html)

<sup>17</sup> See <http://scientific.thomson.com/products/jcr/>

## Duke Energy Climate Partnerships

In support of our goal to resolve the uncertainty around climate legislation, Duke Energy believes it is important to work with other responsible stakeholders. We aspire to be a bridge among various groups, communicating interests or concerns in an effort to move toward a common position. Toward that end, we are active participants in ongoing work with the following groups or coalitions:

### **American Coalition for Clean Coal Electricity<sup>18</sup>**

ACCCE “is a partnership of the industries involved in producing electricity from coal. We recognize that coal, America’s most abundant energy resource, plays a critical role in meeting our country’s growing need for affordable and reliable electricity. Our goal is to advance the development and deployment of advanced clean coal technologies that will produce electricity with near-zero emissions.”

### **United States Climate Action Partnership<sup>19</sup>**

USCAP is a group of businesses and leading environmental organizations that have come together to call on the federal government to quickly enact strong national legislation to require significant reductions of greenhouse gas emissions. USCAP has issued a landmark set of principles and recommendations, underscoring the urgent need for a policy framework on climate change.

### **Generators for Clean Air**

GCA is a coalition of electric generators who rely on coal for a significant amount of the fuel used to generate electricity. GCA’s role is to advocate for climate policies that address the problem of climate change while ensuring the economics of proposed legislation are fair to consumers of the 25 states that the organization represents.

### **Coal Utilization Research Council<sup>20</sup>**

CURC “supports the use of coal in the United States and world wide and advocates the formation of credible and effective partnerships between industry and government to pursue the development of technologies that will enable coal to be used economically, efficiently and in an environmentally compatible manner.” CURC is focused on developing the technologies coal will need to remain viable in a carbon-constrained world.

### **3C – Combat Climate Change<sup>21</sup>**

“The 3C Initiative aims at forming a global opinion group consisting of companies showing leadership by demanding an integration of climate issues into the world of markets and trade facilitated by means of a global framework coming into force in 2013.”

While not coalitions, we rely extensively on outside resources for information and analysis:

### **Electric Power Research Institute**

Policies to limit greenhouse gas emissions are currently debated at international, national, and state levels. Understanding the implications of these policy scenarios is of keen interest to our members. EPRI’s Climate Change programs provide members and public- and private-sector decision makers with analyses and information regarding the potential costs and benefits of domestic and international global climate policy proposals, as well as identifying options and strategies for achieving greenhouse gas emission reduction requirements.<sup>22</sup>

### **Resources for the Future**

“For more than 50 years, RFF has pioneered the application of economics as a tool to develop more effective policy about the use and conservation of natural resources. Its scholars continue to analyze critical issues concerning pollution control, energy and transportation policy, land and water use,

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<sup>18</sup> See <http://www.cleancoalusa.org>

<sup>19</sup> See <http://www.us-cap.org>

<sup>20</sup> See <http://www.coal.org/>

<sup>21</sup> See [http://www.combatclimatechange.org/www/ccc\\_org/ccc\\_org/224546home/index.jsp](http://www.combatclimatechange.org/www/ccc_org/ccc_org/224546home/index.jsp)

<sup>22</sup> See [http://my.epri.com/portal/server.pt?open=512&objID=240&&PageID=346&mode=2&in\\_hi\\_userid=2&cached=true](http://my.epri.com/portal/server.pt?open=512&objID=240&&PageID=346&mode=2&in_hi_userid=2&cached=true)  
<http://my.epri.com/portal/server.pt?open=512&objID=205&PageID=776&cached=true&mode=2>

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hazardous waste, climate change, biodiversity, ecosystem management, and the environmental challenges of developing countries.

Most RFF researchers hold doctorates in economics, but others hold advanced degrees in engineering, law, ecology, city and regional planning, American government, and public policy and management, among other disciplines. In addition to its research staff, RFF has a development office, a communications office, a book publishing operation, and various research support functions, including a specialized library.<sup>23</sup>

#### **MIT Joint Program on the Science and Policy of Global Change**

This program “was founded in 1991 as an interdisciplinary organization that conducts research, independent policy analysis, and public communication on issues of global environmental change. It is not a degree-granting entity.”<sup>24</sup>

#### **The Climate Group**

Founded in 2004, The Climate Group is an independent, non-profit organization focused on developing and sharing expertise among businesses and governments with a common goal of building a low-carbon economy while continuing to boost productivity and competitiveness. In June 2008, The Climate Group and former British Prime Minister Tony Blair collaborated in the publication of “Breaking The Climate Deadlock – A Global Deal for Our Low Carbon Future”, which was unveiled at the G8 Summit in Hokkaido, Japan.<sup>25</sup>

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<sup>23</sup> See [http://www.rff.org/Publications/Pages/CPF\\_AssessingUSClimatePolicyOptions.aspx](http://www.rff.org/Publications/Pages/CPF_AssessingUSClimatePolicyOptions.aspx)

<sup>24</sup> See <http://web.mit.edu/globalchange/www/>

<sup>25</sup> See <http://www.theclimategroup.org/assets/resources/BTCDJune08Report.Fin.pdf>

## Duke Energy's Low Carbon Business Strategy

In addition to our policy and regulatory leadership, Duke Energy is pursuing a strategy to build a sustainable business that allows our stakeholders and our company to prosper in the carbon-constrained environment we all expect.

Certainly, Duke Energy faces a formidable challenge as Congress establishes an economy-wide greenhouse gas cap and trade system. While Duke Energy cannot predict when this will happen, we are preparing today to meet that challenge. Our business plan is designed to ensure we can continue to meet our obligation to provide reliable, affordable electricity to our customers, while also significantly reducing our greenhouse gas emissions.

Our plan includes an array of new technologies and increased diversity of our generation portfolio. It includes an aggressive energy efficiency program, more transmission and a commitment to develop the creative talent we need to build the bridge to the low-carbon future.

We are pursuing this strategy with a few assumptions:

- Congress will pass a federal economy-wide greenhouse gas emissions reduction bill that will require, over time, that Duke Energy significantly cut its emissions.
- Fossil fuels will remain a vital component of the nation's electric generation portfolio for decades to come.
- There is no "silver bullet" that will solve the climate challenge. All low- and zero-carbon technologies must be pursued both in the electric sector and with mobile sources.
- Decarbonizing our economy will be expensive and it will not be achieved overnight. Customers will pay more for energy – the key is for Congress to create a plan that eases consumers into the new economy that carbon caps will create.
- Duke Energy will remain committed to its statutory obligations and to maximizing shareholder value.

To get ready, we are currently assessing the steps we would need to take to reduce our carbon dioxide emissions by half – approximately 50 million tons – by 2030. By then, we will likely have replaced our oldest coal-fired power plants with advanced cleaner coal and other technologies, including nuclear power, natural gas, renewables and energy efficiency.

### **Commitment to Coal**

The construction of our Cliffside Unit 6 power plant is a prime example of Duke Energy's commitment to modernize its fleet by replacing facilities built in the 1940s and 1950s with high-efficiency coal-fired generation. When the new 800-megawatt unit comes on line in 2012, we will commence the process of retiring older coal-fired units in the Duke fleet with consideration given to the impact on system reliability. The retirements will begin at Cliffside itself with the shutting down of 198 megawatts of capacity at Units 1-4. We will then retire an additional 800 megawatts of older, less efficient coal units in the company fleet.

The new Cliffside unit, now under construction about 50 miles from Charlotte, is a supercritical pulverized coal facility that will be equipped with extensive pollution control equipment. This equipment, which includes scrubbers, selective catalytic reduction and fabric filter baghouses will eliminate approximately 99 percent of the plant's sulfur dioxide emissions, 90 percent of nitrogen oxides emissions and 90 percent of mercury emissions. And, although there is currently no carbon capture equipment available, the efficiency of the supercritical boiler will reduce the amount of coal (and its emissions) needed to produce a megawatt of power.

Mindful, however, of the need to further reduce the company's carbon exposure, Duke Energy worked with North Carolina's air regulatory authorities on an agreement that commits the company to making Cliffside 6 "carbon neutral" by 2018.

In Indiana, construction is under-way on a 630-megawatt integrated gasification combined cycle (IGCC) power plant outside the small town of Edwardsport. IGCC technology employs high temperature and heat to turn coal into a synthetic gas and uses the combined cycle feature to generate electricity more efficiently. Gasification allows for pollutants to be removed more efficiently and effectively when compared with traditional pulverized coal.

Edwardsport's pollution control equipment includes a scrubber, selective catalytic reduction and an activated carbon bed to reduce mercury. The plant will also include a state-of-the-art water cooling system, resulting in no thermal discharge to the adjacent White River.

But Duke Energy is most excited about the potential of the Edwardsport IGCC to capture and store its carbon dioxide emissions. Carbon capture and storage (CCS) appears to be better suited for IGCC technology and Indiana's geology gives all indications of being conducive to permanent storage.

Although the plant, scheduled to be completed in 2012, is not currently being equipped with the technology to capture carbon emissions, space is being reserved for it to be added later. Duke has asked the Indiana Utility Regulatory Commission for permission to proceed with a CCS front-end engineering and design study and we anticipate a decision some time before the end of 2008.

Duke Energy believes that successful demonstration of carbon capture and storage technology is essential if coal-fired generation is to remain viable in the new carbon-constrained market. Washington agrees. In 2007, both the Edwardsport and the Cliffside projects were awarded, together, a quarter of a billion dollars in federal clean coal energy tax credits. As coal plants across the nation face a legion of opponents, Duke Energy is committed to prove that these two facilities will, in fact, become the first caissons in the bridge to a low-carbon future.

### **Nuclear Energy**

No true commitment or realistic plan to reduce greenhouse gas emissions can be made without a nuclear renaissance.

Duke Energy has a long history as a safe, reliable provider of nuclear energy to its customers in the Carolinas. While the waste issues remain unresolved politically, we believe it will be impossible to meet the goals suggested in most legislative proposals of 60 to 80 percent reduction by 2050 without the construction of more zero-emission nuclear energy.

Duke Energy has begun the regulatory process to construct a new 2,234-megawatt nuclear power plant (William States Lee III Nuclear Station) in South Carolina, petitioning the U.S. Nuclear Regulatory Commission in 2007 for a combined construction and operating license.

Lee Nuclear would use two Westinghouse AP1000 pressured water reactors, one of the safest and most economical nuclear power technologies in the worldwide commercial market. We anticipate the plant will come on line in 2020.

### **Renewables**

In the last 18 months, Duke Energy's renewable business has greatly expanded both through acquisitions and purchase power agreements.

In May 2007, Duke acquired the assets of Tierra Energy, a leading wind development company based in Austin, Texas. We are currently developing 5,000 megawatts of wind energy in 12 states and hope to have 500 megawatts operating by the end of the year.

Thirteen months later, Duke acquired the assets of Catamount Energy Holdings, which has 1,750 megawatts of wind energy under development in the United States and the United Kingdom and 300 megawatts currently under operation.

Duke's wind interests can also be found in our traditional service territory. The company will purchase 100 megawatts of wind energy to be produced in north central Indiana through a purchase power contract. The Benton County, Indiana wind farm will be a good test of the wind asset potential in the Great Lakes states.

Improved technology and the likelihood of carbon regulation have also spurred the solar business and here, too, Duke Energy has engaged.

Duke Energy began its first solar initiative in 2004 when an 8-kilowatt photovoltaic panel was installed at our customer service center in Bloomington, Indiana. The solar panel is connected to Duke Energy power lines and provides a small amount of renewable energy directly to our customers.

In May 2008, Duke Energy announced it will purchase the entire electricity output of the nation's largest photovoltaic solar farm, which is being planned for Davidson County, N.C. Under a 20-year agreement signed with SunEdison, Duke Energy should begin receiving power from the 16-megawatt facility no later than December 2010. Construction is expected to begin in 2009.

In June 2008, the company proposed a \$100 million plan to install electricity generating solar panels at up to 850 sites in North Carolina, including homes, business and schools. If the program is approved by regulators, Duke Energy Carolinas would spend two years installing approximately 20 megawatts of distributed solar generation on rooftops of customer businesses and homes or on ground sites within the company's North Carolina service area.

In August 2008, Duke Energy announced that it has signed an agreement with Methane Power Inc. to purchase two megawatts of renewable energy generated from the city of Durham landfill, which was closed in the mid-1990s. The project is slated to begin producing power by May 1, 2009, and will generate enough electricity to serve approximately 1,600 residential customers.

### **Energy Efficiency**

We think of energy efficiency as the "fifth fuel," joining coal, natural gas, nuclear and renewables as a critical resource needed to serve the growing energy needs of the communities we serve.

Duke Energy is committed to working with our state regulators in developing energy efficiency programs that both save our customers money and improve our environment.

And we are leading the national effort, joining in a collaborative with the U.S. Department of Energy, U.S. Environmental Protection Agency, state regulators and other utilities to produce the National Action Plan for Energy Efficiency, which is co-chaired by Duke Energy's Chairman, CEO and President, Jim Rogers. Critical to ramping up and effectively implementing energy efficiency is changing the regulatory paradigm. Duke Energy has proposed a save-a-watt model that is designed to help our customers save energy – and money – while still earning a return for our investors.

Under current regulations, utilities make money by earning a return on their investment in physical assets such as power plants, poles and wires, and by charging customers for each kilowatt hour of electricity they use. Under the save-a-watt model, we would be allowed to earn a return on our investments that help customers save energy.

In essence, the save-a-watt model treats investments in energy efficiency just like investments in a new generating station – removing the regulatory incentive to build new power plants. It is a win for our customers, a win for the company and a win for the environment.

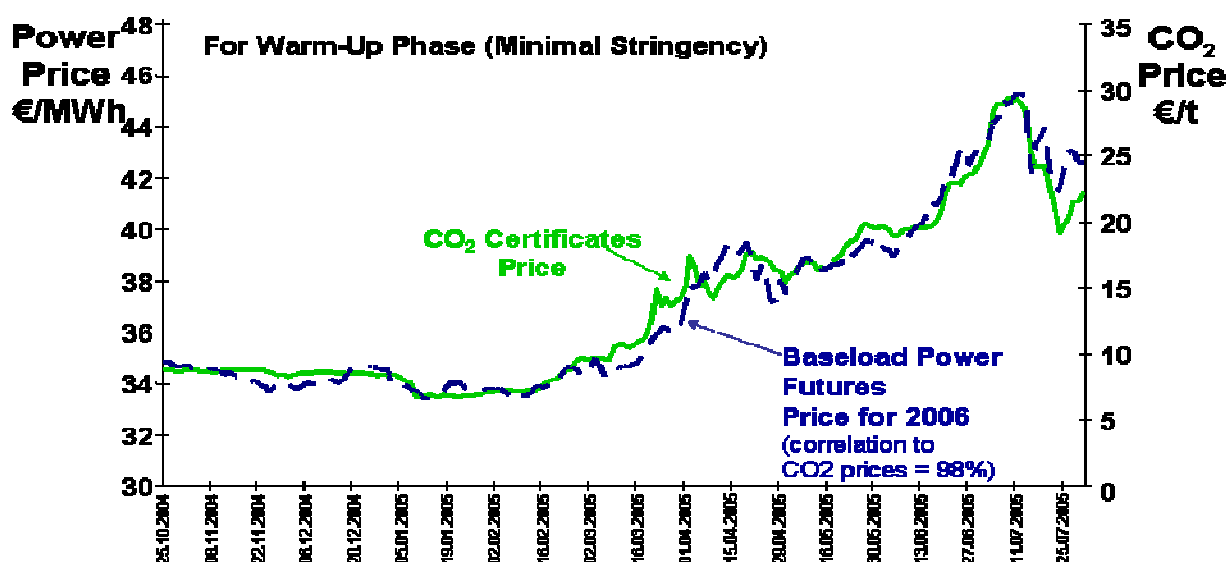
You can learn more about save-a-watt at: [www.duke-energy.com](http://www.duke-energy.com).

## Impacts on Customers

### CO<sub>2</sub> Prices Directly Impact Electricity Prices

Electricity prices will be more responsive to CO<sub>2</sub> prices than gasoline, with coal dependent regions seeing nearly ten times the percentage increase in electricity price relative to gasoline price changes for the same amount of CO<sub>2</sub> price. Unlike gasoline, it can be argued that consumers are less accustomed to, and indeed for those on tight budgets, less able to manage dramatic price changes in electricity. Therefore, shielding consumers from sudden dramatic price changes should also be a priority consideration for policymakers.

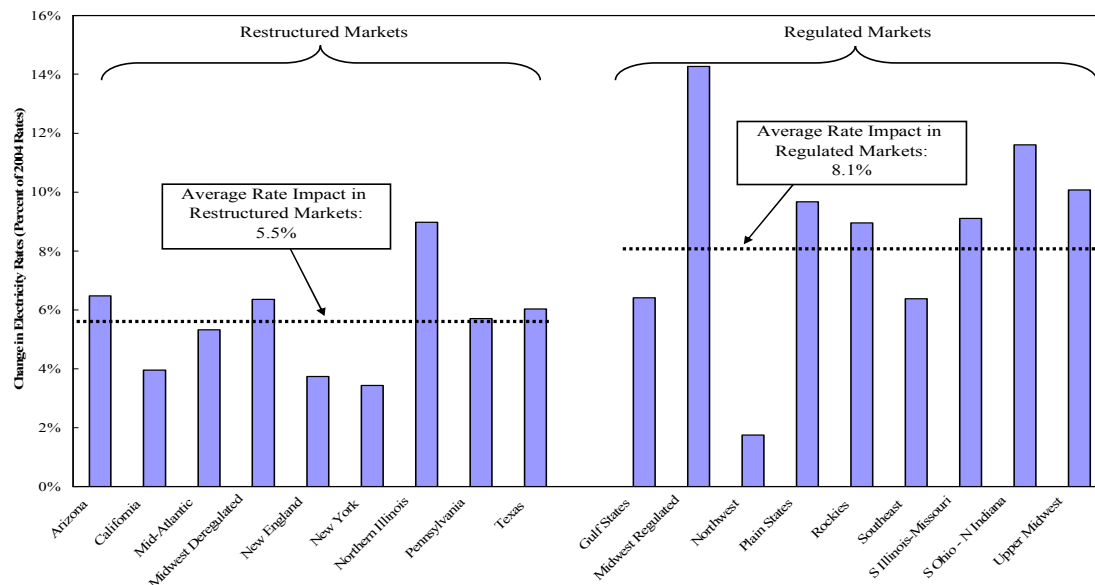
Throughout the United States, electricity prices will move with CO<sub>2</sub> prices. The following chart<sup>26</sup> shows the tight relationship between the two as experienced in the European Union.



The percentage change in electricity prices is dependent on the particular region under consideration, with regulated, coal dependent states (nearly half of the United States) seeing much larger price changes, while deregulated states will see smaller price movements attributable to CO<sub>2</sub> price. The following chart shows the percentage price changes for different markets driven by a \$7.00/ton CO<sub>2</sub> if one assumes a pure auction (no allowance allocations). If, as seems likely, the beginning CO<sub>2</sub> price is higher, price impacts would be higher – a \$14/ton price would produce changes nearly twice as great as those shown. Allocations to electric utilities can be used to moderate these impacts.

<sup>26</sup> Source: IFIEC Europe “Correcting the failures in the EU-Emissions Trading Scheme” Brussels, June 28, 2005

## Regional Electricity Rate Impacts in 2013 as a Percent of 2004 Retail Rates Under the \$7 Price Scenario

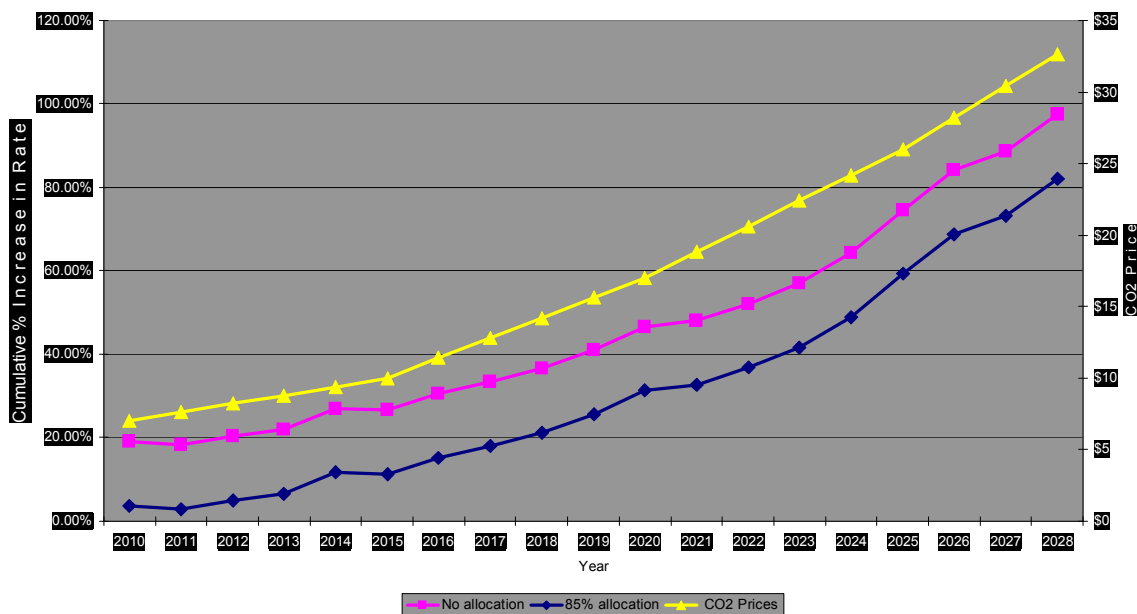


### Allocations Can Dampen the Price Impact to Consumers

Allocations to regulated local distribution companies (LDCs) flow directly to consumers in the form of lower prices, while still providing a strong incentive to generators to lower emissions and pursue alternative technologies. However, allocations will serve to dampen (not block) price increases.

The following chart, based on our analysis of a hypothetical CO<sub>2</sub> price curve under two allocation scenarios, shows the impact on electricity prices in a coal dependent state. The chart shows that with an allocation of 85 per cent that rates still increase substantially. This is driven by the changes in dispatch, fuel switching and rate increases driven by the need to fund investments in new low or non-emitting plants. The primary difference is that rates do not pop-up immediately on day-one of the program. Rather, they increase at a manageable rate over time, reaching the same price point a few years later. This gives customers (industrial and household) adequate time to make the needed investments in efficiency and to shift other costs. Adjustments by customers are still required, but shocks and backlash are avoided.

### Average Rate Impacts of CO<sub>2</sub> Allocation



Absent a substantial allocation, ratepayers must pay for the allowances the utility must consume to generate power as well as the new capital investment that must be made as the new non-emitting plants are built. Those living in regions that already have low emitting plants see smaller price increases because they are using fewer allowances and they do not have to replace most of their power plants. Thus, those who have already made investments in low-emitting assets are rewarded by avoiding the large price increases that await those regions that will now have to follow their example. Low-emitting regions need no additional rewards, nor do they need to be incented to prevent them from investing in high-emitting sources – the CO<sub>2</sub> price will do that for them.

### Economic Objectives of Legislation

Given the linkage between the absolute level of CO<sub>2</sub> prices and incentives for innovators as well as the direct link to customers' electricity prices, Duke Energy believes it is vital that the policy work toward the following objectives:

1. Ease electricity customers (and through them the U.S. economy) into a higher priced market. Too large a price increase in too short a time will be economically disruptive and will create problems for households and businesses on tight budgets.
2. Shield electricity customers from electricity price volatility that will make it impossible for them to manage their household or business budgets. Over time, customers will certainly make adjustments in response to higher prices. Volatility makes this adjustment more difficult as it is harder to estimate the savings or the return on their investment in energy efficiency.
3. Create a predictable steadily growing CO<sub>2</sub> price that provides incentives to innovators to spend capital and effort to develop the new technologies needed to reduce energy use and/or GHG emissions. This does not mean a high price in the first year of the program as few technologies will be ready for this instantaneous deployment.

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### **A Case Study: Lieberman-Warner**

The leading Senate GHG legislative vehicle in the 110th Congress was Lieberman-Warner. The bill was approved by the Senate Environment and Public Works Committee in December 2007, and was debated on the Senate floor six months later. The bill was halted when supporters fell 12 votes short of invoking cloture.

While Duke Energy remains committed to passage of climate change legislation, Lieberman-Warner would have presented our customers with price increases that we concluded were too steep and too fast. Key to that was Lieberman-Warner's requirement that electric utilities purchase nearly 25 percent of the emission allowances needed simply to continue producing electricity. This causes an unnecessary expense for our customers, as we covered in the previous section, and diverts valuable capital away from where it is needed to modernize the electric generation fleet.

In the charts below, we show how Lieberman-Warner would have impacted electricity prices in the states where Duke Energy serves. We also show what would happen if the same legislation included a 100 percent auction of allowances – the policy being advocated by some in Congress and one presidential candidate.

Climate change legislation should not be about “punishing the polluter” or diverting auction proceeds to a myriad of federal programs unrelated to addressing climate change. We need to stay focused and on mission. The goal should be to begin reducing GHG emissions and do it in such a way as to smoothly transition the nation to a low-carbon economy with minimal economic disruption.

It can be done, and Duke Energy will work with any member of Congress and the new Administration who is committed to that goal.

## Potential Cost & Rate Impacts – Kentucky

### Lieberman-Warner (as Originally Introduced)

Year	If Allowance Price =	Allocation Distribution Under S. 2191		If Amended to Require Full Auction			
		Cost to Purchase Allowance Shortfall	Estimated Cumulative Rate Change	Cost to Purchase 100% of Allowances	Estimated Cumulative Rate Change		
<b>Scenario 1</b>							
2012	\$15.00	\$30 M	10.7%	\$60 M	21.6%		
2015	\$17.36 →		\$40 M		13.2%	\$70 M	25.0%
2020	\$22.16		\$60 M		20.9%	\$90 M	31.9%
<b>Scenario 2</b>							
2012	\$30.00	\$60 M	21.4%	\$130 M	43.2%		
2015	\$34.73 →		\$80 M		26.4%	\$150 M	50.0%
2020	\$44.32		\$120 M		41.7%	\$190 M	63.8%
<b>Scenario 3</b>							
2012	\$45.00	\$90 M	32.1%	\$190 M	64.8%		
2015	\$52.09 →		\$120 M		39.6%	\$220 M	75.0%
2020	\$66.49		\$180 M		62.6%	\$280 M	95.7%

Notes:

- 1) Estimated rate changes are relative to current rates and reflect average rates across all customer classes.
- 2) Allowance prices escalated at 5% per year from the starting price.
- 3) These rate changes do not reflect future capital spend.

## Potential Cost & Rate Impacts – Indiana

Lieberman-Warner (as Originally Introduced)

Year	If Allowance Price =	Allocation Distribution Under S. 2191		If Amended to Require Full Auction			
		Cost to Purchase Allowance Shortfall	Estimated Cumulative Rate Change	Cost to Purchase 100% of Allowances	Estimated Cumulative Rate Change		
<b>Scenario 1</b>							
2012	\$15.00	\$340 M	17.7%	\$600 M	31.6%		
2015	\$17.36 →		\$360 M		18.6%	\$640 M	33.8%
2020	\$22.16		\$560 M		29.6%	\$830 M	43.6%
<b>Scenario 2</b>							
2012	\$30.00	\$670 M	35.4%	\$1.20 B	63.2%		
2015	\$34.73 →		\$710 M		37.4%	\$1.28 B	67.5%
2020	\$44.32		\$1.13 B		59.4%	\$1.66 B	87.3%
<b>Scenario 3</b>							
2012	\$45.00	\$1.01 B	53.1%	\$1.80 B	94.9%		
2015	\$52.09 →		\$1.07 B		56.1%	\$1.93 B	101.3%
2020	\$66.49		\$1.69 B		89.2%	\$2.49 B	130.9%

Notes:

- 1) Estimated rate changes are relative to current rates and reflect average rates across all customer classes.
- 2) Allowance prices escalated at 5% per year from the starting price.
- 3) These rate changes do not reflect future capital spend.

## Potential Cost & Rate Impacts – Ohio

### Lieberman-Warner (as Originally Introduced)

Year	If Allowance Price =	Allocation Distribution Under S. 2191		If Amended to Require Full Auction			
		Cost to Purchase Allowance Shortfall	Estimated Cumulative Rate Change	Cost to Purchase 100% of Allowances	Estimated Cumulative Rate Change		
<b>Scenario 1</b>							
2012	\$15.00	\$230 M	12.7%	\$400 M	22.3%		
2015	\$17.36 →		\$270 M		15.2%	\$460 M	25.6%
2020	\$22.16		\$390 M		21.8%	\$570 M	31.6%
<b>Scenario 2</b>							
2012	\$30.00	\$460 M	25.3%	\$800 M	44.6%		
2015	\$34.73 →		\$550 M		30.4%	\$920 M	51.3%
2020	\$44.32		\$790 M		43.6%	\$1.14 B	63.1%
<b>Scenario 3</b>							
2012	\$45.00	\$680 M	38.0%	\$1.20 B	66.8%		
2015	\$52.09 →		\$820 M		45.6%	\$1.38 B	76.9%
2020	\$66.49		\$1.18 B		65.4%	\$1.70 B	94.7%

Notes:

- 1) Estimated rate changes are relative to current rates and reflect average rates across all customer classes.
- 2) Allowance prices escalated at 5% per year from the starting price.
- 3) These rate changes do not reflect future capital spend.

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## Conclusion

Science does not claim to know everything about climate change. The IPCC acknowledges there are gaps in understanding, for example, the manner in which the climate may respond as atmospheric concentrations of greenhouse gases continue to increase. We do not fully know how living organisms may respond or adapt to rising temperatures.

But, we are persuaded that the IPCC review, and the thousands of scientists who have worked for years to understand what is happening to Earth's climate, have produced evidence that can not, and should not, be ignored. Their findings, backed up by our own National Academy of Sciences, provide the catalyst that compels responsible governments to act.

In recent years, the political debate has shifted from a discussion of the science, to a discussion of the economics. Last June's Senate floor debate focused on how ordinary Americans were going to pay higher energy prices – not on what was causing the Earth to warm. Is the science "settled"? We believe that, while there is always more for science to learn, the underlying physics, general cause and effect and risk is understood and accepted by policymakers. And from a political standpoint, a consensus has developed that this risk must be managed.

Both presidential candidates favor greenhouse gas legislation, and have vowed to pass it in their inaugural term.<sup>27</sup> There is clearly consensus in Congress for carefully crafted legislation that achieves both the environmental and economic goals stated in the letter from the 10 Democratic senators.

Duke Energy's role in the climate debate is to represent the interests of its shareholders and customers, and to ensure the policy adopted provides an appropriate bridge to the technologies we need to address effectively carbon mitigation.

We support an economy-wide greenhouse gas cap and trade system, which covers all emissions from fossil fuels, including oil, natural gas and coal.

We favor a large enough allocation to the local electric distribution companies for the benefit of consumers so as to limit rate increases from allowance requirements to 10 percent..

We favor an allocation to the local electric distribution companies, the value of which will flow directly to consumers, with the oversight of the State utility commissions. For traditional cost of service regulated states, the size of the allocation should be based on 100 percent of historic emissions of the generation used to supply the electricity. A separate formula may be required for deregulated or restructured electricity markets.

We support additional funding to accelerate the research, development, deployment and commercialization of clean coal technologies, including carbon capture and storage.

We support a policy that allows for the liberal use of verifiable offsets both in the United States and internationally. Offsets are critical to keeping costs contained, particularly in the early years of a carbon management program.

We support government incentives to revive the nation's nuclear power option. The United States cannot achieve the stated goals in most greenhouse gas bills of 60-80 percent reduction by 2050 without building a new fleet of nuclear units.

We support development of renewable energy through continuation of the production tax credit and construction of more transmission facilities to bring the power to market.

And, we support a national commitment to energy efficiency at both the generating station and the end user.

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<sup>27</sup> See Attachment B hereto.

Duke Energy's evolving business plan is designed to take advantage of all the energy supply options that are available, crafted to adapt to the carbon constraints we see coming. We believe this business plan will allow us not just to survive in this new business climate – but to survive and to lead.

## **About Duke Energy**

Duke Energy is one of the largest electric power companies in the United States. We supply and deliver energy to approximately 4 million U.S. customers. We have approximately 35,000 megawatts of electric generating capacity in the Midwest and the Carolinas, and natural gas distribution services in Ohio and Kentucky. In addition, we have more than 4,000 megawatts of electric generation in Latin America. We are also a joint-venture partner in a U.S. real estate company.

The company is headquartered in Charlotte, N.C., and is a Fortune 500 company traded on the New York Stock Exchange under the symbol DUK.

United States Senate  
WASHINGTON, DC 20510

June 6, 2008

The Honorable Harry Reid  
Majority Leader  
United States Senate  
S-221, the Capitol  
Washington, D.C. 20510

The Honorable Barbara Boxer  
Chairman, Committee on Environment and Public Works  
456 Dirksen Senate Office Building  
Washington, D.C. 20510

Dear Mr. Leader and Chairman Boxer:

As Democrats from regions of the country that will be most immediately affected by climate legislation, we want to share our concerns with the bill that is currently before the Senate. We commend your leadership in attempting to address one of the most significant threats to this and future generations; however, we cannot support final passage of the Boxer Substitute in its current form.

We believe a federal cap and trade program must not only significantly reduce greenhouse gas emissions but also ensure that consumers and workers in all regions of the U.S. are protected from undue hardship. A federal cap and trade program is perhaps the most significant endeavor undertaken by Congress in over 70 years and must be done with great care. To that point we have laid out the following principles and concerns that must be considered and fully addressed in any final legislation.

- **Contain Costs and Prevent Harm to the U.S. Economy:** We hope that you recognize, as we do, the inherent uncertainty in predicting the costs of achieving the emission caps set forth in this or any climate legislation. While placing a cost on carbon is important, we believe that there must be a balance and a short-term cushion when new technologies may not be available as hoped for or are more expensive than assumed. There are many options to deal with the issue and all should be up for discussion in order to meet our environmental and economic goals. Ultimately, we must strive to form a partnership with regulated industries to help them reduce emissions as they transition from an old energy economy to a new energy economy which will protect both our environment and our economy.
- **Invest Aggressively in New Technologies and Deployment of Existing Technologies:** There is no doubt that we need a technological revolution to enter into a low carbon

economy. It is critical that we design effective mechanisms to augment and accelerate government-sponsored technology R&D programs and incentives that will motivate rapid deployment of those technologies without picking winners and losers. We also want to include proposals to provide funding for carbon capture and storage and other critical low carbon technologies in advance of resources being available through the auction of emission allowances. We also need to aggressively deploy existing energy efficiency technologies now to retrofit millions of homes, buildings and manufacturing facilities to reduce electricity costs for everyone.

- **Treat States Equitably:** Just as some groups of consumers will be more severely affected by the cost of compliance, so too will our states. The allocation structure of a cap-and-trade bill must be designed to balance these burdens across states and regions and be sufficiently transparent to be understood.
- **Protect America's Working Families:** Any legislation must recognize that working families are going to be significantly affected by any cap and trade legislation. Price relief for these families must be included in any federal cap and trade program. For instance, one way to provide some relief would be to provide additional allowances to utilities whose electricity prices are regulated, which would help to keep electricity prices low.
- **Protect U.S. Manufacturing Jobs and Strengthen International Competitiveness:** The Lieberman-Warner bill contains a mechanism to protect U.S. manufacturers from international competitors that do not face the same carbon constraints. If this mechanism does not work, or is found to be noncompliant with the World Trade Organization, then the program needs to be modified or suspended. The final bill must include enhanced safeguards to ensure a truly equitable and effective global effort that minimizes harm to the U.S. economy and protects American jobs. Furthermore, we must adequately help manufacturers transition to a low carbon economy to maintain domestic jobs and production.
- **Fully Recognize Agriculture and Forestry's Role:** Agriculture and forestry are not regulated under the bill but they can contribute to reducing emissions by over 20% domestically. Furthermore, international deforestation contributes to 20% of global greenhouse gas emissions. Strong, aggressive and verifiable offset policies can fully utilize the capabilities of our farmers and forests. A strong offset policy can also reduce the costs of a cap and trade program while maintaining our strong environmental goals.
- **Clarify Federal/State Authority:** Congress should adopt a mandatory federal cap-and-trade program that will be the single regulatory regime for controlling greenhouse gas emissions. Existing state laws and initiatives should be integrated into the federal cap-and-trade program where the policies do not conflict. Federal uniformity in this area should be made clear in the statutory language to prevent conflict in regulation, preserve overall efficiency, and ensure harmonization of regulations. Where a conflict exists, federal law needs to clearly prevail.


- **Provide Accountability for Consumer Dollars:** The cap and trade program developed in the Lieberman-Warner bill has the potential to raise over \$7 trillion. Much of these funds will be indirectly paid for by consumers through increased energy prices. The federal government has a fundamental obligation to ensure these funds are being spent in a responsible and wise manner. The development of any cap and trade program must recognize the sensitivity of this obligation and eliminate all possibility of waste, fraud or abuse.

We look forward to working with you to ensure that any final bill will address the problems of climate change without imposing undue hardship on our states, key industrial sectors and consumers.


Sincerely,



Debbie Stabenow



John D. Rockefeller IV



Carl Levin



Blanche Lincoln



Mark Pryor



Jim Webb



Evan Bayh



Claire McCaskill



Sherrod Brown



Ben Nelson

**From the candidates for President of the United States: Responses to questions posed in ScienceDebate2008.com**



“There can no longer be any doubt that human activities are influencing the global climate and we must react quickly and effectively. First, the U.S. must get off the sidelines and take long-overdue action here at home to reduce our own greenhouse gas emissions. We must also take a leadership role in designing technologies that allow us to enjoy a growing, prosperous economy...specifically, I will implement a market-based cap-and-trade system to reduce carbon emissions by the amount scientists say is necessary: 80 percent below 1990 levels by 2050. I will start reducing emissions immediately by establishing strong annual reduction targets with an intermediate goal of reducing emissions to 1990 levels by 2020. A cap- and-trade program draws on the power of the marketplace to reduce emissions in a cost- effective and flexible way.”

---**Sen. Barack Obama (D-IL), Democratic presidential nominee**



“We know that greenhouse gas emissions, by retaining heat within the atmosphere, threaten disastrous changes in the climate. The same fossil-fuels that power our economic engine also produced greenhouse gases that retain heat and thus threaten to alter the global climate. No challenge of energy is to be taken lightly, and least of all, the need to avoid the consequences of global warming. The facts of global warming demand our urgent attention, especially in Washington...to dramatically reduce carbon emissions, I will institute a new cap-and-trade system that over time will change the dynamic of our energy economy. By the year 2012, we will seek a return to 2005 levels of emissions, by 2020, a return to 1990 levels, and so on until we have achieved at least a reduction of sixty percent below 1990 levels by the year 2050. In doing this, we will transition into a low carbon energy future while promoting the technological innovations that keep us on a course of economic growth.”

---**Sen. John McCain (R-AZ), Republican presidential nominee**