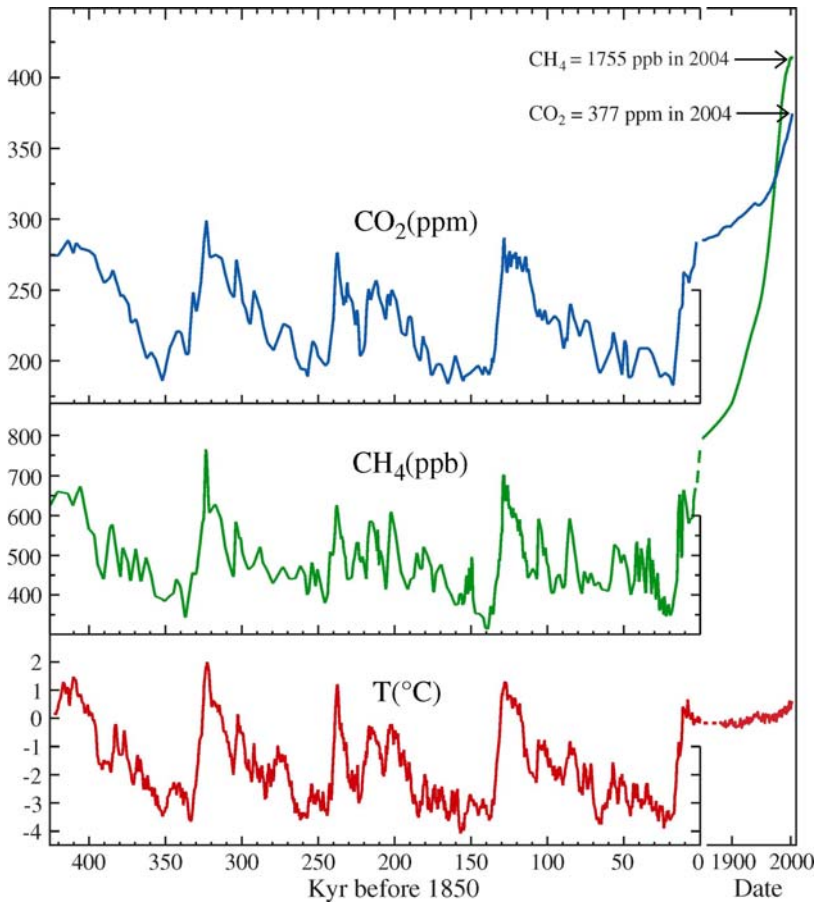
How bad is it?

This is the single most important issue of our lifetime.

Check out the chart below. In just 100 years, we've managed to drive CO2 levels to almost double the highest they've been in the last 500,000 years. In short, we've NEVER seen anything close to how bad it is now.

And look at methane! In just 100 years, we've managed to almost triple the concentration of methane which is a far more potent GHG than CO2. It's literally off-the-chart in the chart below!

CO_2,CH_4 and estimated global temperature (Antarctic ΔT/2 in ice core era) 0 = 1880-1899 mean.



Source: Hansen, *Clim. Change*. **68**. 269. 2005.

Temperature increases lag the CO2 and CH4 increases by about 50 years due to the thermal inertia of the ocean (the x-axis before 0 BC is on a much more compressed scale than the scale after 1850 which is why you cannot see this time lag between GHG and temperature in the historical data). The oceans are like a giant swimming pool and CO2 is like the "temperature setting" knob …because the ocean is so big it takes 50 years to start to see the pool start to react to your temperature setting. It's called "thermal inertia." And it works the same way in reverse…even if you reduced GHG to zero world wide tomorrow, it would take about 200 years for temperatures to return to normal for the same reason.

In other words, **we are only just beginning to feel the punch of what we've done**. And that punch we are feeling now is already devastating (driest years on record, water shortages, North Pole to completely melt in less than 30 years, etc) both in the US and abroad.

Even the ranchers in Texas notice it. They were up in arms when the Texas Governor recently tried to approve the fast tracking of new coal plants in Texas. Fortunately the plan got axed due to the takeover of the power company which was contingent on nixing the plan.

The question you have to ask yourself is **if the Texas ranchers notice climate change now and are adamant about it not getting worse, what do you think will happen over the next 50 to 100 years** as the climate rises every year at an ever accelerating rate commensurate to the amount of GHG we've dumped into the air**?**

As you can see from the chart, **we ain't seen nothin' yet**. That temperature graph is highly likely to track the GHG concentration curves the same way they have in the entire history of our planet. **In our lifetimes, we are going to see temperatures that far exceed what our planet has seen in 500,000 years**.

Unless we take immediate action now to dramatically reduce our GHG emissions, then over the next 100 years, the average temperatures will increase every single year at an ever accelerating rate. We are just seeing a "sneak preview" right now of what is to come.

It just gets worse and worse from here.

Even the most optimistic estimates, i.e., those of the IPCC, paint a devastating picture The IPCC estimate is optimistic because it is based on the predictions where there is 90% agreement and that means it is the "best case" scenario. The most likely estimates are much worse.

I asked David Hawkins at NRDC if scientists know what happens to temperature if CO2 concentrations pass a tipping point where the oceans start emitting CO2 (note: there is a 30% chance we may have already passed this tipping point):

> The short answer is we don't know. Some scientists think we should be paying much more attention to understanding the potential for a "runaway greenhouse" effect where the ocean becomes a source of CO2 rather than a sink. Then you could get temperature changes much higher than the top of the IPCC range. Eventually (hundreds of years) a new equilibrium would be reached but it would be a vastly different world.
>
> I don't think we should try to make the case for action based on the highly uncertain, truly apocalyptic scenarios. The Stern report scenarios should be reason enough to act if they are believed. We should focus on getting them believed rather than debating another set of even more dire possibilities.

> The best way to think about the tipping point is in terms of braking distance--if there is a fixed barrier ahead, the longer we delay in hitting the brakes the more damage we are committed to.
>
> We are already close enough to the "wall" to know that we will hit it but hitting it at 10 mph is manageable; hitting it at 60 is not. Every year we delay raises the crash speed and we don't know for sure by how much.

His analogy is incomplete. At some point we pass this fork in the road and if we miss the "turnoff" (i.e.,. don't turn our emissions around fast enough) then it's a road where the road gets steeper and steeper downhill and our brakes stop working, i.e., the temperatures increase without limit for a couple of hundred years or more.

In short, these days are, without a doubt, the "best" days we will ever see in our lifetime.

Unless we act, and we act quickly, they may be the best days that the human species will ever see for hundreds of years or more.

What should we do about it?

Our top climate scientist, James Hansen told us:

> **The faster and deeper we cut our GHG emissions in the next 10 years, the better our chances of averting a tipping point.**

I believe **virtually every climate scientist in the world would agree with Hansen's statement.**

In short, **we should SLAM on the brakes as fast and as hard as we can**. To do anything else but that is unthinkable. That means **setting a stretch goal for the country** that is beyond what we think we can do and achieving it.

There is no scenario anywhere suggesting that it costs us less to wait and solve the problem "later."

What are we waiting for? Why aren't we acting?

Why are we waiting? Simple. **We are just like the frog** sitting in the heated water in Gore's movie. No more complicated than that. Politicians don't like to make changes unless there is a VISIBLE crisis that gets the public to demand change and over-power the vested special interests.

Global warming is like weight gain…very gradual, a pound a week. There is never a single identifiable crisis that can be DEFINITIVELY linked to be caused by global warming to mobilize political will. It just gets worse and worse, so gradually that by the time you notice, it's too late. Just like the frog.

But unlike weight gain where your weight stabilizes because calories burned is proportional to your weight (negative feedback that increases with increasing weight), our weight gain in global warming every year isn't declining. It's doing the opposite; it's *accelerating*! We getting heavier and heavier every year at an ever increasing rate! That's because for CO2, the negative feedback is a constant (oceans + vegetation). Therefore, the more you increase CO2, the higher your annual rate of climate change. But that constant negative feedback is now shrinking as we burn forests away. And the negative feedback turns into positive feedback when the oceans get warm enough. This means that CO2 then grows even faster and temperatures rise even faster since most of the stabilizing negative feedbacks are gone.

We need a real leader who is not afraid of the special interests. These people exist in other countries, but the US seems to be in short supply of leaders who have a long term vision for our country to be a world leader. We had such a leader in 1961 with JFK. It's arguable if there was one after that.

Why is the next 10 years critical? Can't we wait?

No we can't wait any longer. We should have acted 20 years ago when our top climate scientist Jim Hansen first brought the issue to the attention of Congress. Instead, President George Bush (the first one) negotiated a non-binding climate treaty and then ignored it. Clinton and Gore didn't submit the Kyoto treaty to the Senate to ratify thanks to a wonderful mis-information campaign paid for by the oil companies. And when Bush was running for President, he promised to cap our GHG emission, and after he was elected and Christine Todd Whitman tried to do exactly that, Bush did an about face, and said no caps, we'd never comply with the Kyoto treaty, and ordered that references to the US National Assessment of Climate Change be removed. All of this was shown on PBS (Frontline "Hot Politics"). Here are other incidents of suppression that were on that show: http://www.pbs.org/wgbh/pages/frontline/hotpolitics/reports/suppressed.html

Climate change is now completely out of control and we are now seeing the "tip of the iceberg" as far as impacts.

The next 10 years is absolutely critical. **If we do not make dramatic cuts in the next 10 years, then our mitigation options rapidly disappear as David Hawkins of NRDC pointed out to me**.

In short, if we don't hit the brakes fast, we move from "completely out of control" to "completely out of *our* control."

Here's what David Hawkins, director of NRDC's climate center, said:

> Without agreeing or disagreeing with the specific numbers in the paper, I think the basic point is correct: the immediate need is to preserve options. **Without action right away, options to cut emissions by 50%, 75%, 80% by 2050 all disappear rapidly.** Rather

> than make the 2050 emissions target the center of the debate, we **need to make the target for 10 and 15 years from now the focus of our advocacy**.

In short, unless we act aggressively now, and get other nations to follow, our planet is toast.

Do we have enough time now to fix this problem if we do act and other nations follow?

Maybe not.

In Monbiot's Heat, he points out that **there is a 30% chance that we are already too late** (p. 17).

We have confirmation of this from our own top scientist, James Hansen, who has publicly admitted that **we may be past the tipping point**. He's testified that the tipping point is not more than 450 ppm CO2 "**and it is probably less**." We are at 382ppm CO2 (which is 425ppm CO2-equivalent) today so in other words, **we may already be too late**.

If we can't cut fast enough, what happens?

We don't know because this level of GHG has never happened before.

The earth heats up. It gets hotter and hotter every year since there is no cooling mechanism and CO2 has positive feedback when you pass the tipping point.

Even after we are extinct things will continue to heat up for a while. It is hard to predict because we've never seen anything like the run up in CO2 and methane ever. At some point the CO2 dissipates and temperatures start cooling.

If we cannot cut fast enough, passing the tipping point is a certainty.

As George Monbiot explains the tipping point in "Heat":

> If carbon dioxide released from the burning of fossil fuels reaches a certain concentration in the atmosphere – 430 parts per million parts of air – the likely result is two degrees of warming. Two degrees centigrade is the point beyond which certain major ecosystems begin collapsing. Having, until then, absorbed carbon dioxide, they begin to release it. This means that 2° inevitably leads to 3°. This in turn triggers further collapses, releasing more carbon and pushing the temperature 4-5° above pre-industrial levels: a point at which the survival of certain human populations is called into question. Beyond 2° of warming, in other words, climate change is out of our hands: there is nothing we can do to prevent it from accelerating. **The only means, [Colin] Forrest argues, by which we can be fairly certain that the temperature does not rise to this point is for the rich nations to cut their greenhouse gas emissions by 90% by 2030**.

Our biggest sink of our CO2 is the oceans. 66% of our CO2 is absorbed by the oceans. If we pass a tipping point, the oceans start to emit CO2 instead of absorbing it. It is like what happens if you have a balanced scale and the move all the weights to the same side. Things get dramatically worse.

Think of the global environment like blood and CO2 like acid. Blood is a chemical buffer. One can take a vat of human blood, whose pH is 7.4, pour concentrated hydrochloric acid into it, and the pH remains the same. Keep pouring, and keep pouring the acid, and the pH stays at 7.4. But then, add one more drop of acid, and the "tipping point" is hit, the chemical structure is altered, and acidity goes through the roof.

A team of international ecologists using a computer model to predict the effects of climate change say as many as 1 million species could be on the way to extinction by the year 2050.

Here are the most optimistic predictions from the IPCC according to news reports:

> Even in its softened version, Friday's report forecasts scenarios over the coming decades that many find unthinkable: **three billion people without adequate water supply, agriculture and forests decimated around the globe**, melted glaciers and ice sheets, one-third of the world's species driven to extinction and major global regions ravaged by floods, violent storms and storm surges. The report also forecasts an unprecedented environmental refugee crisis as major populations get displaced.
>
> **Climate change is paving a "highway to extinction"** which could see billions of people perish from hunger, malnutrition, disease, extreme weather events, heat-induced stress and lack of drinkable water by the year 2050, according to the latest report of the UN's Intergovernmental Panel on Climate Change due to be released in Belgium next Friday.

It is critical to note that the IPCC report is not a true picture of just how bad things are; it is viewing the world through the eyes of our most conservative scientists since it is a least common denominator type of report, i.e., it is essentially a view of the world through "rose colored" glasses (called "high agreement" in the report itself).

Can we switch to biofuels like ethanol?

Renewable biofuels are part of the solution mix.

But **some renewable biofuels are worse than oil**!

What is missing from the speeches I hear is the critical factor: it is not the biofuel per se that is bad; it is **how those biofuels are manufactured** that matters You can make biofuels that are GHG neutral. And you can make biofuels that are worse than gas. So

E85 per se isn't a step in the right direction unless we require that the E85 is manufactured in a carbon neutral manner so that the entire lifecycle of the fuel is carbon neutral, i.e., the plants absorb as much carbon as the fuel emit.

How come we haven't heard more about this from our government?

They don't want people to know about it since it runs counter to the best interests of our special interests. So the information is suppressed. The Bush administration engages in censorship of scientists and reports that talk about the impacts.

Here are some excerpts from Frontline's "Hot Politics"
http://www.pbs.org/wgbh/pages/frontline/hotpolitics/reports/suppressed.html

> Critics say this type of government control of simple scientific discussions is unprecedented.
> …
>
> **Incidents of Supression:** In 2000, the U.S. Government Climate Research Program published the *National Assessment of the Potential Consequences of Climate Variability and Change*, a multi-year, $10 million government study. Over the next few years, links and references to the National Assessment were deleted and removed from U.S. government Web sites and other forums discussing climate change.
> ….
>
> "I have not seen a situation like the one that has developed under this administration during the past four years, in which politicization by the White House has fed back directly into the science program in such a way as to undermine the credibility and integrity of the program in its relationship to the research community, to program managers, to policymakers, and to the public interest."
> From Piltz's 2005 resignation letter.

Can we solve this problem alone?

No, not a chance. The US cannot act alone to solve this problem. We must work cooperatively with other countries.

For example, even if the US cut emissions to zero tomorrow and maintained that zero emissions, CO2 levels would continue to rise at an ever increasing rate every single year.

We must set an example by doing, then encourage other nations to follow. If they do not, we may have to go to war to save our planet from burning up. What other option is there?

Sounds odd, doesn't it. It is a simple matter of equilibrium (you won't find this in Gore's movie):

> We are only 25% of world wide emissions. And world wide emissions are currently (at 7 GtC/yr) more than double the amount that the planet absorbs (at 3 GtC/yr of which 2 GtC/yr is absorbed by the oceans, and 1 GtC/yr by plants). **So everyone on the planet must cut their emissions by 57% to prevent the CO2 concentration from getting worse every year and temperature rises from growing at an accelerated rate every year.** In short, if everyone cuts right now by 57%, then the amount of CO2 we emit = the amount the planet absorbs and the CO2 concentration stops growing. But if not everyone cuts, then the bar is set much higher for the other countries that do cut.

The bottom line is that everyone on the planet does not cut their GHG emission by at least 60% world wide, then temperatures will rise at an ever increasing rate and our planet will be toast in about 100 years just on the basis of the CO2 and methane already in the air (see graph on page 1).

If it isn't already too late, we can avoid the tipping point if we act aggressively now in the US and we RAPIDLY export our methods to China, India, and other countries and incentivize them to make similar cuts. These changes to our policies and those of other high CO2 emitters MUST happen within the next 10 years.

That is why the 2008 Presidential contest is the most critical in the history of our planet.

What are other countries doing?

Most are way ahead of us. Canada recently announced a 20% cut by 2020.

And they are mad at us. One person who read this told me:

> All are trying, some more than others, to combat global warming and all agree that the threat is severe. I was asked by the Pakistani Minister of Transportation in November of last year at the AsiaRail 2006 Congress, "How can the US talk to us about combating global warming when you are 4% of the world's population creating almost 30% of the green house gasses!" All I could do was plead guilty and note that some of us were trying to change that awful trend.

Are there other benefits of cutting deeply and quickly right now?

Yeah, if we cut now, it saves us money and strengthens our economy.

There isn't any study anywhere that shows that waiting longer will reduce our costs!

We have to deal with it sooner or later. The sooner we put on the brakes, the less the total cost.

An aggressive goal has additional benefits:

a. It would inspire the country to achieve more than experts think is possible, e.g., as JFK did in 1961;
b. It would reduce or eliminate our dependence on foreign oil;
c. It would improve our balance of trade (no more $ going overseas to pay for oil);
d. It would strengthen our economy (RMI says a $180 billion *total* investment in reducing our dependence on foreign oil creates a $150 billion return *per year*!)
e. It would improve our standing in world opinion;
f. It would create millions of new jobs in America (California's law is projected to save billions of dollars and create tens of thousands of new jobs);
g. It would create products that can be exported to further improve our economy;
h. It would allow us to secure, *to the best of our ability*, the long-term health and prosperity of our country and our world;
i. It would modernize our economy and make the world more secure;
j. It would free up billions of dollars that we now spend defending and subsidizing fossil fuels to spend on the nation's real priorities: health care, education, taking care of the aging population, etc.; and
k. It would motivate hundreds of thousands of people to put their heart and soul into helping a candidate that supported aggressive goals because there would finally be a candidate who is supporting a goal that is both important to them and worth fighting for.

Will voters support this?

They should on the basis of the benefits above, i.e., even if you don't believe in global warming, doing these actions is good for our economy.

How many voters would, if given a choice, choose to live in a home where every day, the government comes in and raises the thermostat 1 degree and you cannot stop it? That's what we have with global warming, but on a much longer timescale. Maybe that is the best way to get public support. Ask them what kind of home they want to live in.

Why an aggressive GHG reduction goal is important

For me, it boils down a simple question of leadership. Global warming is the single most important issue of our lifetime. CO2 levels (at 425 CO2 equivalent) are 50% higher than at any time in the last 500,000 years; well beyond any "natural fluctuations" (which peak at 300ppm). And our methane levels are literally "off the charts;" they are almost 3 times higher than at anytime in the past.

Unless we bring these numbers down, and do so quickly, our planet is headed for a giant melt-down as the oceans heat up over the next 200 years commensurate with the amount of CO2 we've already dumped into the atmosphere. And every year, we make things worse. CO2 is growing at an ever increasing rate and our temperatures are rising every year at an ever increasing rate.

If we are to preserve the quality of life we now enjoy, we must have a President who has the courage to make an aggressive 10 year GHG reduction goal the nation's top priority. We must have a President who will inspire and challenge us to rise to the greatest challenge of our lifetime and inspire other nations to follow. We must have a President who believes in America, who will invest in America, and who will be a cheerleader for America to win. We need a President who has the courage to set a goal for America and stick with it, a goal that some will say we cannot achieve, and who will hold us accountable for achieving it. America desperately needs such a leader. Isn't that you?

In the Democratic Convention in San Diego, Senator Obama said that he learned early in life that "**when people rally around a goal they can achieve extraordinary things**."

That's exactly right! But **the goals the Democratic candidates have endorsed are not aggressive enough over the next 10 years**. It is less than the best we can do. And for this problem, we can't give it just a *good* try. We must give it our *best* shot. **And you must ask us to do our best.**

The new French President has said he would make global warming a top international priority. He said, "The United States has the duty not to oppose the fight against global warming, but to lead that battle because what is at stake is the destiny of mankind."

He's right. And that is why **I'm asking the Presidential candidates to set a goal that will inspire America and the rest of the world.** I'm asking you to set a **tougher**, 10 year goal for GHG reduction. Will you?

Are you willing to set a bold goal where there is ample evidence that the goal is critical to achieve, yet we currently do not precisely know how we are going to achieve it? That's what is important to me.

I'm looking for a candidate that is willing to say something like this:

> "I've traveled to all parts of this great nation of ours. Each place that I go, I ask people what kind of future people want for themselves and their children. Do they want to live in a country where every year, the temperature gets hotter and hotter *at an ever increasing rate*? Where hurricanes are more intense, where water shortages and drought are more frequent? Where at some point ever increasing temperatures are completely out of our control and they increase even faster every single year? Or a country where temperatures stop rising and start returning to normal?
>
> My opponents are advocating cuts that are **guaranteed** to be *insufficient to stop the warming from **accelerating** every year*. Under their plan, *even if the entire world complies*, for at least the next 30 years, all of these things will continue to get worse *at an ever increasing rate*. Is that the future you want? I don't think so.
>
> Our scientists tell us the sooner and more dramatically we cut, the better our chances of avoiding a tipping point where temperatures are out of our control. It is

> time we started taking that advice. To stop the source of the problem from getting worse every year, we must cut our GHG emissions by 60% in 10 years which will put a halt to the rise of GHGs in our atmosphere. Just like JFK's man on the moon goal in 1961, I can't tell you in detail how we'll be able to do it. I do know this: it will not be easy and it will require a lot of sacrifices and ingenuity of the American people. We will have to cut our emissions at more than twice the rate that California has required of its residents. But I believe in America. We can do this. We can rise to meet this challenge and beat it. And if there is ever a time to ask for sacrifices, this is the time. Because if we don't take dramatic action quickly, our country and our planet will never be the same. We will be guaranteed a future where every year is worse than the year before at an ever increasing rate. That is unacceptable."

Due to the global warming problem, the 2008 election is more critical than any election in history. I'm looking for a candidate who will challenge our country to do our *best* to avoid a worldwide disaster. So far, I've been disappointed. All of the top Democratic candidates have announced support for the reductions in the Sanders-Boxer bill. This is a good start, but we need to do better than this because **even if the entire world complied with the Boxer bill, temperatures would continue to get worse at an ever increasing rate for at least the next 30 years.**

But we have a major problem because our top Democratic candidates are ignoring what our top scientist is saying is the most *prudent* course of action (dramatic cuts rapidly) and instead are supporting the *minimum* cuts advised by some scientists (which also assumes that all nations make this cut). That's not surprising however. Few experts have suggested a more aggressive goal (for reasons I'll explain below).

Here's the kind of bold thinking I'm looking for:

> A candidate who sets an aggressive 10 year goal for the country and the world that will ensure that we take steps to mitigate the effects of global warming ***to the best of our ability***, e.g., establishing a goal of at least a 30% reduction from current levels or, ideally 60% from currently levels.

Set a signature goal: "Reduce our GHG emissions by *at least* 30% by 2020 and help the rest of the world to do the same."

Experts I've asked say that if we focus, we can cut our GHG emissions by at least 30% in 10 years at an affordable cost. We cannot stop there; we must continue to cut every year after that. But the next 10 years is the most critical.

We are sponsoring a few independent groups of our top scientists to validate this in more detail. We are asking them to answer the question: "what if we had to cut by 30%; what would we need to do and how much would it cost?" There may even be ways to get to cut substantially more than 30%. We'll ask that too.

I don't think there is any reason that we would we want to cut our emissions slowly over 43 years and have a >50% risk of catastrophe (which is what happens under the minimal IPCC recommendations) when we can get there quickly at an affordable cost and reduce our overall risk of an environmental melt-down.

We will actually spend less money by taking action now, so it doesn't make economic sense to delay. **Global warming is like cancer in that respect; it's cheaper to treat it aggressively and quickly.** In both cases, the longer you wait, the harder and more expensive the remedies.

Sounds hard, doesn't it? Good goals should be hard. Very hard.

Others (including Lester Brown, Terry Tamminen, George Monbiot) have called for more aggressive goals to this (in some cases, a lot more aggressive) and laid out strategies for how to achieve them.

I'll explain below how it can be done using technology that is in common use today. I'm sure there are other ways.

I'll also explain why such an aggressive and seemingly impossible goal is actually a more responsible goal than setting a 43 year goal, or a much lower goal.

What could be more important than that? So that's why this letter is so long. But if I can do all that, then it's worth reading the next 27 pages, right??

I'm will admit that today global warming is not yet the most important goal to Americans or the key to winning votes in this election. People are concerned about the war in Iraq, terrorism, gas prices, jobs, energy independence, etc. because these are easy for people to relate to because of the direct impact on their lives.

Fortunately, the things we do to reduce our GHG emission have benefits that Americans can relate to, as I outlined on page 1. And I also know that a lot of Americans will respect a candidate who looks at the polls and respects what the American people are thinking, but who is able to rise above that and take a courageous position on certain key issues because it's the right thing to do for the long-term health and prosperity of our country.

We see such leadership in world leaders in other countries, e.g., the leaders who have embraced the Kyoto Protocol. Unfortunately, these leadership qualities seem to be in short supply in people running for high office in the US. For example, the last 10-year goal set by a US President that we actually achieved that anyone remembers was in 1961 with JFK's "man on the moon" goal. That was 46 years ago.

You have this "JFK-type" of quality about you where you have been able to rise above the strategies and tactics and focus on what leaders are supposed to do: set clear, measurable goals for the country and hold us accountable for meeting those goals.

That is the key here. That's exactly what JFK did in 1961 and what you must do today to solve the global warming problem. Because there is no other option.

The accountability piece is critical too. **Monitoring and enforcement of the strategies we end up choosing are as important as the strategies themselves**.

The biggest problem our planet has right now is that there is no global warming goal that will inspire people and for people to rally around and achieve the extraordinary things you spoke about.

Scientists from every environmental group acknowledge that the focus has to be on progress in the next 10 years. But where is that 10 year goal for the world to achieve? It is almost nowhere to be found! **At the Senate hearings on climate change in January 2007, ot one single lawmaker or Presidential candidate talked about what the 10 year goal needs to be for the US or the world.** Most scientists refuse to set a goal as well.

So there is a leadership vacuum. It's a leadership vacuum that I hope you will step up to the plate and fill.

Why? Because you and I know that the global warming is by far the biggest problem that our entire civilization has ever faced. The future of our entire planet is at risk. If we do nothing, even our most conservative scientists say our planet is toast for sure in less than 30 years. This problem must be solved globally and the US must lead the way with our actions, not our words.

So isn't it sad that the focus of the Democratic convention in San Diego was the war in Iraq?

Don't get me wrong. I hate the Iraq war. I was against the war from day 1 because we lacked sufficient proof of a threat. If it had gone to court, we couldn't even have won a civil judgment against Iraq. Going to war should require the criminal standard of proof ("beyond a reasonable doubt"). We never had that. Congress should have demanded such "beyond a reasonable doubt" proof before authorizing war.

We need a President with excellent judgment who can evaluate the facts and make the right decisions.

Your most important goal as President will be to set an aggressive target for the US itself to meet in order to show the world that this possible, and then encourage other nations to follow. And **we have less than 10 years to get this done** because if we can't get it done in 10 years, then 1) it will be too late to do anything (we will be out of options) and 2) we will have caused irreparable harm to our planet. Both outcomes are unacceptable.

Lester Brown will be recommending an 80% reduction by 2020 in Plan B version 3.0 that he is writing now. President Clinton is quoted as saying this about Brown's book: "Lester Brown tells us how to build a more just world and save the planet from climate change in a practical, straightforward way. **We should all heed his advice**." Well said!

Brown's goal is also echoed by Terry Tamminen, the highly regarded former Secretary of the California EPA.

The selection of a goal is tough; it should be high enough to challenge our nation to respond, but not so high as to be seen as unachievable even by the most optimistic experts. And it cannot be so high as to be politically unacceptable.

Certainly, **setting a goal that is easy to achieve not a credible or responsible response to the problem**. We (a coalition of progressive groups including MoveOn, StepItUP, NRDC, Sierra Club, etc.) can assemble a mix of scientists, business leaders, world leaders, and environmental groups that will enthusiastically support you in your call for an aggressive 10-year goal.

As far as the final number, certainly we need to set it high enough to ensure we avoid the tipping point (which is somewhere less than 450 ppm) and high enough to account for a "safety margin" in case things do not go as planned both within the US and with other countries. **And the higher we set it now, the less expensive it will be for us later.** But it cannot be so high that even the optimists cannot see a path to achieve the goal. It cannot be so high as to economically impossible to afford.

So that is why it is so critical we give it our best shot now.

Subsequently Hansen was told withhold information from the public unless the Administration approves of what he wants to say. From the *Washington Post*:

> This tipping point debate has stirred controversy within the administration; Hansen said senior political appointees are trying to block him from sharing his views publicly.
>
> When Hansen posted data on the Internet in the fall suggesting that 2005 could be the warmest year on record, NASA officials ordered Hansen to withdraw the information because he had not had it screened by the administration in advance, according to a Goddard scientist who spoke on the condition of anonymity. More recently, NASA officials tried to discourage a reporter from interviewing Hansen for this article and later insisted he could speak on the record only if an agency spokeswoman listened in on the conversation.
>
> "They're trying to control what's getting out to the public," Hansen said, adding that many of his colleagues are afraid to talk about the issue. "They're not willing

> to say much, because they've been pressured and they're afraid they'll get into trouble."

And if you don't believe Hansen, and believe President Bush, then we don't know anything!

> "We do not know how much our climate could, or will change in the future," President Bush said in 2001, speaking in the Rose Garden of the White House. "We do not know how fast change will occur, or even how some of our actions could impact it."

So in any of these cases, **no matter who you believe is right, the strategy is exactly the same**: you're playing with the planet's future so in the face of uncertainty, the only responsible course of action is to "**play it safe**" and assume that virtually all our scientists and every scientific paper on the subject published in a peer-reviewed journal are correct about the risks of increasing our GHGs.

If we are too late, then it doesn't matter what we do. But if we are not too late, then **we must do things that maximize our chances of beating the "tipping point."** And we should maximize our chances of staying within a range that our scientist are absolutely certain is safe. We should not venture into "uncertain" territory. **We should be focusing on how to stay within proven "safe" levels rather than speeding at 425ppm toward the edge of a cliff.**

Therefore, the only logical strategy is that we take Hansen's advice: **we must cut as hard and as fast as we reasonably can**. So we better set a very high bar and try our best to meet it. If we set too high a bar, e.g., a 100% reduction, the costs become unfeasible and the public would never support it. So there is a "cost curve" associated with GHG reduction.

Why choose 30%?

Basically, we should pick the most aggressive point that is just below the point where the economic and political costs start going up exponentially.

The 30% goal is technically feasible according to Amory Lovins, NRDC, etc.

California law requires California to reduce to 1990 levels by 2020 (a 25% cut from business as usual levels).

Canada is going for a 20% cut, so we must do better to lead the world and show what can be done:

> John Baird, Canada's Minister of the Environment, on April 26, 2007 unveiled Turning the Corner: An Action Plan to Reduce Greenhouse Gases and Air

> Pollution, which imposes greenhouse gas and toxic air pollution reduction targets on industry.
>
> The government's goal is an absolute reduction in greenhouse gas emissions of 150 megatonnes by 2020—**about a 20% cut from current levels** and an approximately 300 megatonnes reduction from projected 2020 levels—and cutting air pollution from industry in half by 2015.
>
> In addition to measures to reduce air emissions from industry, the government has committed to addressing emissions from transportation by regulating—for the first time in Canada—the fuel efficiency of cars and light duty trucks, beginning with the 2011 model year.

But 30% may not be aggressive enough. We'd need to cut by 60% worldwide to stabilize CO2 at the current level and keep it from rising. If you want to stop the "temperature setting" knob from going up every year, a 60% cut is required.

Examples of goals:

- Yale has a goal to reduce emissions by 43% by 2020 and they have a plan to get there.
- LA's mayor has announced a plan to cut the city's GHG emissions by 35% below 1990 levels by 2030 (note that the reference point is 1990 and not today; had it been today, that % cut would be even higher!) http://www.greencarcongress.com/2007/05/los_angeles_may.html
- California's AB32 law requires a 25% cut (from a "business as usual projection") by 2020, and California is already one of the most energy efficient states in the country (per capita)
- California uses half the national average of electricity per person per year (6kWH/pp/yr in California). If all states followed California's lead, we could cut national emissions by 50% right there!
- Businesses should have the option of paying a carbon tax on their emissions or reducing them. That carbon tax should be used by the government to purchase the equivalent GHG reductions, either in the US or abroad. So the worst case cost can be pinned down.

Here are the costs from Fred Krupp, President of Environmental Defense that he sent to me in an email in December 2005 when I asked him what $300B would buy.

> Steve, I checked with the experts, and although I know you can buy tons at $5, the experts advise for this quantity we should use $10 as the price.
> You can still buy a lot of tons :
>
> $300B would buy 30,000 MMT (million metric tons) of CO2.
> Last year US emissions per EIA were roughly 6000 MMT CO2.
> So $300B would be enough to offset all US GHG emissions for 5 years.

> According to our break-even price calculations, you could actually buy real reductions @ $10/ton in Russia, Ukraine, and tropical forests. The supply is there. Russia probably has around 2 billion tons (2000 MMT) available over that 5 years.
> And tropical deforestation emits roughly the same amount of CO2 as the entire fossil fuel CO2 of the United States (roughly).
> Brazil last year achieved a 30% reduction (year-on-year) in deforestation.
> So in principle that $300B would be enough to grab sufficient emission reductions in Russia/Ukraine and slow deforestation sufficiently that the entire emissions of the US could be offset for 5 years.
> Another way of looking at this is, how much emissions do we need to cut to keep open the option of stabilizing at 450 ppm?
> We need to cut US emissions by 15% by 2025, based on latest EIA projections which put US emissions at 7587 MMTCO2e in 20205.
>
> | **US emissions** | **2004** | **2025** | **Reductions needed to achieve 15% reduction from 2005 levels by 2025** |
> |---|---|---|---|
> | (In MMTCO2e) | 5919 | 7,587 | 2555.85 |
>
> If we need, by 2025, annual reductions @ 2556 MMTCO2e, just back of envelope assuming roughly 1%/year US emissions increase, it looks like the $300B would buy roughly all the annual reductions needed to get to that point. Am running the numbers right now assuming constant dollars (i.e., tons purchased lump sum today).

In other words, to cut our emissions over a 10 year timeframe to 6,000 MMT to 4,000 MMT (which is a 33% cut), it means an average cut of 1,000 MMT per year over the 10 year period. In short, if we just do a brute force purchase of emission credits, **the cost of a 30% GHG reduction is on the order of a paltry $10 billion per year if we were to purchase it from other countries!**

Attractive as this may sound however, it is the responsibility of every nation to reduce their emissions within their own country or this won't work. So if we do purchase GHG reductions, we should be purchasing them from domestic sources. However, our government should allocate $10 billion to purchase reductions in other countries in addition to the reductions we make in the US as part of our commitment to reduce GHG worldwide.

According to Tamminen's data in his book *Lives Per Gallon*, our government spends an astonishing $100B/yr on tax breaks and other federal incentives to oil (also noted in Lester Brown's book; see excerpt below). So what's not to like? The cost is less than 10% of the money we are now using to incentivize the wrong behavior. We just shift our tax dollars to incentivizing clean energy, instead of dirty energy. Why would we not want to do that? Which is more important? Subsidizing oil companies or our planet?

We also spend $100B/yr in rebuilding Iraq. Which is the smarter investment: invest in Iraq? Or invest the same $ in rebuilding a new, cleaner, safer, healthier, and stronger America?

Is rebuilding Iraq more important than the future of our planet? Time to make some hard choices. I know which way I'd vote if given the choice.

Isn't it time we started investing in America?

Wouldn't it be great if we had a President who said:

> We're going to start seriously investing in America, we're going to create millions of jobs, we're going to end our dependence on foreign oil, and we're going to have the world's cheapest energy costs, and we're going to do what we need to do to stop global warming... And we're going to do it in 10 years because the sooner we do it, the stronger our economy.
>
> We CAN do better; we have to band together and do what's right for America. Jeopardizing the health of our planet is not negotiable.

It is therefore disappointing to me when I read the bills proposed in Congress. Senator Feinstein's "Ten in Ten bill" would reduce car emissions by 18% by 2025, for example. While this is huge progress in CAFÉ standards (which haven't changed in 32 years), it's not good enough. Such 1% per year reduction approaches would be fine if we had lots of time. **But we are out of time for the easy solutions. It's time to stomp on the brakes, not gently press them**.

It's like this….we are riding in a car that is going 60 miles and hours and our speed keeps increasing every second. We are now told that there is a cliff in front of us and if we do not stop in time, we're dead. We ask our scientists, "how far away is the cliff?" We are told that there are varying opinions; some say it is within 50 feet, others estimate it is 500 feet, a few of them think we just went over it. And you know that in general, the prognostications from the scientists have tended to be on the optimistic side. You and your kids are in the car. Do you apply the brakes gently and gradually hoping that the guy who said you have 500 feet before the cliff was right? Or do you press down as hard as you can on the brake pedal and apply the emergency brake? Any sane person would do the latter; we'd try to stop as fast as we possibly can. Well, our bills in Congress aren't doing that. They are better than nothing, but they are too little, too late.

And we had better put a safety factor into the predictions of our top scientists. For example, no scientist had predicted that the collapse of the Larsen B ice-shelf would happen so soon and so rapidly; this ice shelf was rock stable for 12,000 years and it disintegrated in less than a month.

> We knew what was left would collapse eventually, but the speed of it is staggering," said Dr David Vaughan, a glaciologist at the Bas in Cambridge.

> "[It is hard] to believe that 500 billion tonnes of ice sheet has disintegrated in less than a month."

It's time to stop tinkering, as Time Magazine recently put it, with "the knife-blade margins within which life can thrive" on the only known habitable planet in our universe. It's time to stop taking chances with our planet and STOMP on the brakes.

And stomping on the brakes, while expensive at first, is ultimately beneficial to our economy and our health. So what are we waiting for?

As for impossibility, **JFK's goal was also impossible at the time**. But this is not an academic exercise. The goal is set where it is because that's what we must achieve if we are to have the best chance at preserving the quality of our life.

The other analogy that is appropriate is WWII. JFK's goal didn't require the average person to make any sacrifices. In WWII, everyone recycled, collected raw materials, gave up some of their fuel for the cause, and we converted our entire industrial complex into an enterprise that made the machines we needed to win the war. I know there are also difficulties with this analogy, because people don't want to make similar sacrifices, especially when they don't see Nazis coming over the hill. But **if we have a visionary leader who can show people that what is coming over the hill this time is just as devastating as WWII**, then perhaps we can call upon the sense of community and engender a willingness to contribute, indeed to sacrifice whatever is needed to win this new war.

As for solutions, the more I learn, the more it appears we can meet this goal. For example, one solution that has been proposed involves requiring every carmaker to convert their fleets to hydrogen power in existing internal combustion engines (ICE) rather than fuel cells. If you use PHEVs with solid H2 storage and purchase off-peak power to make the H2 via electrolysis, this is a competitive solution (and it's even more competitive when you consider that the price of gas with all the real costs is close to $11/gallon as explained below). People told me that it takes 7 years to re-tool to build a new car. Yet as Monbiot points out, **in 1941, the car makers were able to completely re-tool in less than a year** (p. 98)! If we could do that 50 years ago, why can't we do it today? Were we smarter back then? Were the computers more powerful back then?

We need a bold integrated plan, short, medium, and long term

We need a short, medium, long term plan of integrated measures like this for the US (this description is from http://www.oilendgame.com/Legislation.html):

This package comprehensively addresses Hawaii's decades-long overdependence on imported oil for its energy by establishing a **bold, strategic energy policy framework of integrated measures** to encourage and support market-based development of reliable, cost-effective, and self-reliant energy systems. The package's **integrated, coordinated, and complementary measures** constitute a network of **policy pathways to achieve**

results over the near-, mid-, and long-term. This **energy vision** will enable Hawaii to attain a niche leadership role in the global hydrogen energy economy by **accelerating** the **development** of the state's own **indigenous, renewable energy resources**.

A plan such as this, but for oil reduction (rather than GHG reduction):
http://www.oilendgame.com/pdfs/WtOEg_Presentation.pdf

How can you do it?

To do this, everyone must participate and government must lead.

Electric power and all transportation equal 72% of total US CO2, so that is the most critical area to focus on with a unified solution. In California, which has relatively clean electric power generation, 41% of emissions are from transportation and 20% is from electric power (see http://www.energy.ca.gov/2005publications/CEC-600-2005-025/CEC-600-2005-025.PDF)

My vision is a future where:

1. all the stationary power is renewable and clean,
2. all transportation is powered by H2, carbon-neutral biofuels such as properly produced E100, or any other 100% clean fuel.
3. we have invested in building a national electric grid so that clean power can be added from the places it can be most efficiently produced and stored where it can be most efficiently stored, and converted to H2 where it can be most efficiently converted, i.e., essentially an Internet of power generators and storage.

We can't get there overnight, but I think by having a vision of where you are trying to go, you can then lay out a 30 to 40 year path to attain that goal and **set the expectations right now with the power and transportation section so that they have 30 years to get there**. When was the last time we had a great vision and a long-term goal for this country that we were serious about? JFK in '61.

And I'll bet that there is not a single car company or power company that can't meet that goal. Of course, all the American companies will whine until the cows come home just like they whined about how CAFÉ standards would destroy them when we instituted them 32 years ago.

For our short term goal, we probably want to set a goal for each sector to achieve. This is very similar to the CAFÉ standards we have now for car makers. And CAFÉ standards worked amazingly well (we just didn't keep raising them which was our mistake and we left this giant SUV loophole that the car makers exploited by making heavier vehicles).

So for the transportation sector, we'd probably want to set a goal where by 2020, all new cars are getting a corporate average of X pounds of GHG emissions per mile (notice how the metric changed from mpg to lbs. of GHG/mi). Similarly, for the power sector, we'd

be looking for an average of Y tons of GHG emissions per megawatt. The power companies have the freedom to choose whether they scrap their power plant or add CCS.

However, if the DOE is correct that CCS won't be able to be deployed until 2020 at the earliest (per testimony of Tom Shope, acting assistant secretary for fossil energy to the Senate on April 16), then it may be our best strategy to bite the bullet do the transition now to clean power: build new wind (or other clean) power and as the clean power comes on-line, we scrap our dirtiest coal plants. Then if CCS is available sooner, it can be used to achieve deeper cuts. We need to hedge our bets here; our planet is at stake.

These are the key elements are:

- **Have a big vision:** Why not build thermo solar in the desert and wind in the central states and storage facilities where appropriate and then retire our dirtiest coal plants first?
- **Freeze and start reducing GHG now**: We cannot allow things to get worse; in California, you can no longer build a power plant unless it is as clean as our cleanest natural gas plants. Period. No exceptions. And as of February 1, 2007, the PUC voted 4-0 to ban the purchase of power from coal plants!
- **Invest in relevant R&D now**: the proper level of government investment in R&D and demonstration projects of critical technologies such as CCS, H2, compressed air storage, etc.
- **Don't set up a structure where the GHG's just get exported**. A company's suppliers must be counted in the company's emissions. Otherwise, you'd see massive subcontracting offshore in order to meet domestic emissions requirements. This actually makes the problem even worse. The reason they are building all those coal plants in China is partially to make products for the US. The US has to make it clear that you will be taxed if the products are made by polluting the environment. Either they clean up their emissions or we move the jobs back to America.
- **Create a $10B GHG venture capital fund**. Steve Perlman, inventor of WebTV and a proven serial entrepreneur, has a fantastic idea on how to have the road power vehicles without wires. He needs $5M to create a pilot roadway to prove it will work. No VC will fund this because it is too risky even though Perlman has a fantastic track record. We need a VC who is invests the government's money to solve our problems and is willing to take higher risks.
- **Incorporate new technologies**. Spain just installed Europe's first commercial tower technology solar thermoelectric power plant, PS10, an 11 MWatt facility in Seville. They are on their way to powering the entire city by 2013. Why can't we replicate that here? The largest thermo solar plant in the world exists in the Mojave and 2 more are planned from BrightSource Energy (operates as Luz Energy in Spain) in conjunction with PG&E. Hypercar technologies have been available but not used. Carbon composite structures are 6 to 12 times stronger than steel in crashes, but they weigh less and are cheaper to produce. So you get lighter, safer, cheaper to make cars that are also easier to manufacture, e.g., hybrids that get nearly 100mpg without plugging it in at all. But NHTSA is currently rewarding heavier cars, not safer cars!

- **Put a market price on carbon**: we must put a market price on carbon and other GHGs and enforce that. Such a carbon tax should probably go on gradually to give people time to reduce their emissions and, in the end, pay no tax. Cap and trade is an alternative to a carbon tax, but essentially they achieve the same goal.
- **Stop rewarding things that make the problem worse**. we must put an end to everything where we subsidize behavior that is at cross purposes to our objectives, i.e., we need to end all government fossil fuel subsidies and credits (which amount to about $100 billion per year) and allow them to compete fairly with clean technologies. I was astounded when I read in Lester Brown's Plan B 2.0 book that if you truly took into account all the environmental costs and subsidies, that gas would cost about $60 per gallon. We are still doing this even today. There is a law created in the Depression which is being used to incentivize people to build new coal plants! The headlines were "U.S. loans for coal plants clash with carbon cuts: Federal effort comes in conflict with move to limit greenhouse gases." We need to **modify these laws** to **only provide incentives if the power is GHG-free**.
- **Get support from other nations**. If other countries choose not to voluntarily reduce their emissions, then we need to help persuade them with sanctions such as a carbon tax on goods and services from those countries who do not meet world goals for GHG emissions. For example, if China and India aren't cutting their emissions as a country, then all their goods and services should be taxed commensurately to make it economically unattractive for US companies to do business with them. The more those countries cut their GHG emissions, the more they'll help their economy. So now the incentives work in reverse to the way they work now. It would be interesting to see what happens.

  We must not be afraid to impose trade sanctions, including, if necessary, cutting off all trade, for countries which do not reduce their GHG emissions. We must have a zero tolerance for this. Other nations who are also cutting will probably feel the same way and with enough nations threatening trade sanctions, it may be enough to make GHG gas reductions a national priority in China and India. If not, we must be prepared to follow through on trade embargoes by the US and EU of goods and services from countries who don't get on board even after the imposition of carbon taxes. This can be positioned as "we are no longer sending US jobs overseas," i.e., more jobs for Americans.
- **Make it really safe to invest in clean renewable energy.** In Germany, there is a guaranteed purchase price for the wind power. That has worked better than any other strategy. In the US, we do the reverse. The incentives are really short term and can be yanked out from under the investor at any time. Companies aren't investing in wind because we aren't making the Production Tax Credit permanent, for example.
- **Educate the public and create awareness on an on-going basis:** we need to get everyone educated and engaged. That means we must start by educating consumers and businesses on how they can reduce their emissions and reward businesses that set and meet those goals. For example, Yale has a goal to reduce

emissions by 43% by 2020 and they have a plan to get there. Every business should be encouraged to do the same!

- **Adopt Hansen's recommendations**: Adopt all of the recommendations made by Jim Hansen in his Senate testimony.
- **Consider carbon intensity rather than absolute caps**. If a business is growing, but its $/CO2 is increasing, then even though its absolute CO2 may be going up, its carbon intensity is going down. Which is more important? Which is more fair? For example, Dell leads the computer industry by a wide margin in carbon intensity, but because their business is growing fast, their absolute CO2 emissions may not decrease as much as other companies with flat sales. Should they be penalized? A carbon tax would be fair in this case and would reward Dell without impacting their ability to grow their business.
- **Create and commit to a 40 year "business plan" for our core strategy on transportation and stationary power so that business can plan without uncertainty.** Setting targets for the next 40 to 50 years could provide some certainty for economic agents who would have to make substantial investments in new, climate-friendly technologies. We should do the planning so that our programs and incentives are not at cross purposes with each other and so that investment in one sector can be made safely because other sectors can be relied upon, e.g., investing in wind is safe when you are guaranteed that all your power can be sold; investing in ethanol plants is safe when you know gas stations are required to put in the pumps and car makers are required to make the cars, investing in home electrolyzers becomes safe if we know that a certain number of H2 fueled vehicles will be made, etc.

  Government must make some key strategic decisions. For example:
  - Is it better to retrofit our gas and coal plants with CCS knowing that the power is going to be 30% more expensive or should we cut our losses and phase them all out over the next 10 years and replace them with carbon neutral power?
  - Are we better off letting H2 and Ethanol compete with each other, or should we put all our focus behind a few key technologies?

- **Efficiency, conservation, re-use; lots of little things**: we need to do everything we can to reduce emissions by incentivizing conservation, efficiency, technology (such as CCS), and requiring the deployment of clean and efficient technologies on our new cars and homes including boring but high-payoff items such as insulation and lighting which save energy and save consumers money, i.e., we should be educating people on the "negative cost" items since these are no-brainers.
- **Copy what works in other states and other countries.** California now has 50% of the per capita energy use of other states. The Energy Foundation is working to get many other states to follow CA's example. We use about half the energy per capita compared to average Americans (and about the same as Europeans). It was done with our appliance, bldg, and other efficiency standards, plus decoupling of utility profits from electricity sales. Other states should copy the policies adopted

in California. For example, in California, by a 4-0 vote of the PUC in Feb 1, 2007, you can no longer buy power from a coal plant. Texas deployed wind power almost 5 times faster than the legislature asked them to. Canada's 20% reduction by 2020 focuses on emission intensity which I think makes a lot of sense. Canada also gives credit to people who started cutting their emissions before the law passed.

- **Invest internationally**. Allocate $10 billion/yr to purchase reductions in other countries. Only countries which have reduced their emissions to 2000 levels are eligible and it's a high watermark system so a country must continually reduce emissions in order to be eligible for the credits. Otherwise, the system can be gamed.
- **Carefully evaluate scrap vs. retrofit costs and timeframes**. We may have to bulldoze a bunch of coal plants and replace them with clean power because there may not be time to install all the CCS infrastructure in time and government may need to compensate the power companies for that.
- **Give us feedback on how we are doing**: Wouldn't it be great if newspapers showed the state of the planet on a regular basis, e.g., earth temperature, CO2 concentration, ice left in the North Pole. If every day, it is put in front of us that our planet is melting, then it's easier to get people to demand action or at a minimum change their behavior to be more energy conscious. It's like trying to lose weight…having a scale sure helps to know how you are doing!
- **Educate internationally**. I don't know if this is possible, but people who live in China have no clue about global warming. They aren't going to help fix it if they don't know it is a problem.
- **Implement policies that help stabilize the population**. We have too many people for the planet to sustainably support. We past the equilibrium point in 1990 and every year we add 2% to the imbalance. We must take actions to stabilize the population. This helps global warming and a host of other issues. Specific actions we can take: (1) educate women (2) provide access to birth control information and contraception (3) stop rewarding families with more than one child (currently, the more kids, the higher your deductions). But Tim Wirth is an expert in this area and we should consult him. Few people think "out of the box" like this as solutions to help mitigate climate change. But the nice part of population stabilization is that it helps solve a number of other issues too, so it is two birds with one stone.
- **Help other countries build infrastructure**. People in Vietnam burn their trash every night because there is no garbage pickup. Again, buying carbon reductions at $10/ton in other countries may be in our best investment (as well as cheaper than reducing domestically in many cases).

To get a 30% reduction, the objective is to try to drive both power plant and transportation sectors to zero net GHG emission as fast as you can. In some cases, you only get an 85% reduction or more. In other cases, you can't.

While this sounds hard at first, we can do this!

Give me any car, I can reduce it's emissions by 85% in a day by converting it to run on E85. It is unclear however that I can buy CO2-free E85. But I can scrap that car and replace it with a PHEV running on H2 in a compressed air tank or solid storage.

Give me any power plant, and I can reduce it's GHG emissions to zero either through CCS or replacing it with renewable power. It's just a question of how fast we can scale. We may not be able to do it in 10 years, but if not, we probably won't miss by much.

In order to achieve such big reductions, we must convert and/or replace power generation with clean sources and do the same with transportation. We'd create national grid, allow power to be generated anywhere on the grid and be sold (putting a carbon tax on unclean power which should cause it to be phased out), and convert our mobile fleet to E85 at the same time increasing efficiency through new cars that get 100+ mpg (as existing PHEVs get today!). Our power plants go from dirty to carbon neutral or carbon free over the next decade. Then you couple that clean grid with flex-fueled PHEVs. Older cars get converted to run on E85. The vision for this strategy is that at the end of the decade is that well over 30% of the vehicles and power plants would be carbon neutral.

Emissions from new vehicles would drop by more than 97% from today's values: 80% drop by using PHEV (i.e., 100 mpg vs. 22mpg), another 85% drop using E85 instead of gas (assuming the E85 is properly produced which is happening now in a few corn ethanol plants (see http://www.khoslaventures.com/resources.html and read the "Part I" whitepaper, look at the NRDC table in Part II, but also look at http://i-r-squared.blogspot.com/2006/07/vinod-khosla-debunked.html to put things into perspective), but we need to be far more rigorous about this than we are now and require that all ethanol produced after a certain date be carbon neutral), and you'd get another 50% or so decrease by using hypercar technologies. So **this combines to be a 98.5% decrease just by using technologies that are in use today**! The transitions happen over more than 10 years as new cars are sold and/or converted, not overnight, but the biggest transitions (to E85) can happen rapidly. The switch to cellulosic ethanol, PHEV, and hypercar materials will take more time, but the changes need not all happen at once and be coordinated.

To make this work, a key strategy is for the government must create a foundation that makes it safe for companies to invest in CO2 neutral ways of making ethanol, wind, and other carbon-emission free or carbon-neutral technologies. Some things to consider:

- Government must invest more in CCS research and in building a number of demonstration projects (using each generation technology) at scale (e.g., capable of storing 1 million tons CO2/yr). **The funding in both these areas is woefully deficient and needs to be fixed ASAP**.
- You have to put a market price on carbon via cap and trade or carbon taxes.
- We must cap carbon emissions to be no more than it is today. We should adopt a national policy that new coal plants be required to employ CCD without delay. By taking that action, the U.S. can speed deployment of sequestration at home and set an example for countries like China and India.

- We shouldn't just look at the US. The goal is really to reduce world emissions. So it should be just trade emissions credits in the US, but we should be able to do that abroad as well. Imagine what happens if the Chinese are suddenly motivated by money to cut their emissions instead of the other way around. To avoid fraud, however, it might be smarter to have carbon taxes paid to the government and have the government purchase the credits from credible sources, local and abroad. Otherwise, it is too easy for China to build a power plant that is constructed soley to get the carbon credits when it is shut down.
- Make a strategic bet on E85 to power our vehicles requiring pump installation, and requiring all auto manufacturers to make their fleets 100% flex fuel capable (gradually increasing the % of converted vehicles to 100% over 5 years). Subsidizing the fuel cost should not necessary (although we may need to help cellulosic ethanol to get of the ground). Ethanol is arguably lower cost than gas even without subsidies (but is subject to supply/demand fluctuations just like any other commodity and right now the supply is low and the price is high which is why there are so few pumps). For the past 25 years, ethanol has been more costly than gas, but it appears that that is now changing (thanks to the high price of gas). Vinod Khosla, a major backer of ethanol, believes no ethanol subsidies are necessary so we should heed his advice and end subsidies for fossil fuels and corn ethanol.
- We must put a carbon tax on fuels (including E85 that isn't manufactured in a carbon neutral way) to reflect their true cost. This is very important. **Biofuels made the wrong way can make the problem worse.** For example, corn ethanol made using power from coal is as bad as gasoline from a GHG perspective. If biofuels are made properly, they can be nearly carbon neutral, and in some cases (corn biomass CCD and cellulose CCD), actually reduce GHG emissions (CCD=carbon capture and disposal).
- To deal with the installed base of vehicles, the government can set a rebate amount for each vehicle based on the estimated conversion cost to convert to FFV. This rebate should go down in time to incentivize people to act quickly. People collect their checks at a government inspection station which prevents cheating by dishonest gas stations. Owners should want to convert to flex fuel since the cost to convert is minimal and the fuel savings should provide huge incentives to switch (unless the oil cartel drops their prices to sabotage this in which case government needs to step in). Therefore, this is a way to deal with the huge installed base. There are over 240 million cars in the US and since annual sales are in the 16 million vehicles/yr range, it would take 15 years to replace the fleet with high mileage PHEV or similar vehicles. That is why making it attractive (or even mandated after 10 years) to convert existing vehicles so they can run on E85 is needed if we are to meet our goal (assuming we can produce that much E85 which might be a stretch). We probably don't need a mandate that you have to be converted in 10 years; by making the conversion basically free, the cost of fuel should drive every consumer to get their car converted.
- We might even consider incentives to cause our dirtiest most fuel inefficient vehicles to be scrapped if they are replaced with a low GHG emission vehicle, e.g., a FFV PHEV. Auto companies would love this; they'd sell more cars!

- Incentivize the sale of FFVs that get 100 mpg or more. PHEVs can do this today, but we can be technology neutral, e.g., BEVs such as the Tesla are another option. Therefore, car manufacturers who choose not to offer PHEVs or BEVs will find that they won't be able to compete. You essentially do a feebate where cars with the highest mpg get a rebate and cars with the lowest mpg pay a fee. This isn't a tax; a feebate is revenue neutral. California is in the process of passing a feebate now for cars. Basically, we put a market price on carbon which we should have done long ago.
- To avoid a conflict with habitat and biodiversity from land conversion we need a lot of "zero-carbon" electricity to go into surface transportation, i.e., we need to generate clean electricity and then use that to power our cars. Therefore, we should provide big incentives for car manufacturers to move rapidly to convert their cars to vehicles which have zero emissions for trips under 30 miles, e.g., e.g., PHEV. The car manufacturer can't object to this; if they say PHEVs are impossible to achieve, then the government says fine, then nobody will get the incentives and it's no different than the status quo today so why are you complaining? The only reason you could complain is because you think it is possible. And if it is possible, why can't you do it?
- Install the infrastructure to move energy around, i.e., regional and national electric grids so that renewable energy can always be sold
- Provide *permanent* investment tax credits for wind and other clean renewable sources. Guarantees that the power is purchased before unclean power would be a plus.
- There needs to be some sort of reward system for homes and businesses that cut a lot, e.g., some sort of big kicker each month if you lower your electricity bill by 40% or more.
- Only allow new power plants to be permitted if they do not emit CO2.
- Provide big incentives to retrofit existing coal plants with CO2 sequestration, e.g., a carbon tax of around $30 per ton of CO2 should shift the economics to cause power companies to fix their plants
- Put a gradually increasing carbon tax on existing fossil fuel power plants and the fuels themselves. This provide incentives for power companies to switch to carbon-emission free power since with a national grid, only the low cost generators will make any money
- Put a gradually increasing carbon tax on pure gasoline to further help people to switch to an E85 vehicle
- Providing low-carbon fuels for aircraft and probably for shipping would require using biomass to make Fischer-Tropsch fuels.
- The government needs to be clear that new coal plants being built today will not be exempt from future carbon-emission regulations.

And we should be doing the simple things:

- Require all new construction to install solar heating/cooling. This is happening in China (direct solar water heating) with huge market penetration even without government regulation!
- Make it economically attractive convert rooftops to solar

- Incentivize the installation of solar water heaters (SWH) on existing homes. The return on investment is huge. SHW is a very effective and efficient use of solar energy and should be everywhere. SHW is far too often ignored in favor of solar photovoltaics. I guess it's harder for people to get excited about plumbing than it is about electricity (for some reason). There is huge penetration in China without any government incentives! It is low-hanging fruit; the best way to reduce GHG emission is not to generate the power demand in the first place! We should be embracing all "low hanging fruit" like this with both hands.
- Building insulation and lighting are both "negative cost" items, i.e., they reduce costs. Building codes should require all new buildings to use high efficiency lighting and high insulation
- …the list goes on and on. There is a HUGE untapped potential from efficiency and efficiency is always the cheapest way to reduce our GHG emissions. Increasing our energy efficiency will put more money in the pockets of consumers while helping to defray the costs of some of the other measures described above.

We cannot just be thinking only about policies within the US because this is a worldwide problem. Our emission will soon be rounding error compared to China and India. **We must export our methods and require China and India, at a minimum, to achieve substantial GHG cuts.**

About 65% of the total mitigation potential (up to 100 US$/tCO2-equivalents) is located in the tropics and about 50% of the total could be achieved by reducing emissions from deforestation. In other words, since the goal is worldwide, we should look at areas which have the highest return on our investment and **in certain cases it may be cheaper to invest in certain activities in other countries to achieve our goal**. Demand for sugar cane and palm oil used in biofuels is driving this deforestation. **Currently 23% of global CO2 emissions come from deforestation.** By providing the know-how to make biofuels more efficiently from other means, we can reduce some deforestation without spending a dime.

There are other solutions than the one I outlined above. These can and should be part of the mix. It is doubtful we can fuel our country on ethanol even if would could ramp up production fast enough and we did have enough land (experts disagree on this).

And there is considerable debate about ethanol itself among experts. Christopher Cook writes in *New America Media* (Jul 13, 2006):

> There are critical, unresolved questions about ethanol's benefits and costs. In fact, this headlong Corn Rush risks considerable collateral damage to the environment, American farmland and food production -- and to all who drive and eat.

For more ethanol controversy, see http://i-r-squared.blogspot.com/2006/07/vinod-khosla-debunked.html. Instead of subsidizing ethanol and gas (both of which should not be needed), we might be better off using the same money to incentivize people to buy more fuel efficient cars.

Our non-partisan expert panel needs to decide fact from fiction so we are not, as we have in the past, incentivizing and promoting fuels that are at cross purposes from our objectives.

Tamminen advocates quickly moving to hydrogen as a fuel, using off peak power to generate carbon-free H2 by electrolysis, and moving the grid to 100% clean renewables, with a national electric grid so people who build the plants will be able to sell their power. He advocates having the government pay $5,000 per car to convert them to burn H2 instead of gas (so use H2 in an ICE instead of a fuel cell). And new cars can be manufactured to use solid H2 storage which would provide an acceptable range for consumers. If car manufacturers to convert their hybrids to plug-in hybrids and convert their gas fuel to using solid H2 storage, you can get over a 200 mile range in a Toyota Prius using the same sized tank as on the original Prius. ECD-Ovonics has demonstrated this in their Prius conversions. They were able to get **H2 in an internal combustion engine to be nearly as efficient as fuel cells due to the hybrid design** http://www.hydrogenforecast.com/ArticleDetails.php?articleID=241. The stats are even better if you add "plug in" to the vehicle. Since the average driving range of a car in the US is around 26 miles, such cars can easily run 100% on electricity most of the which is very cheap and efficient (running on hydrogen if generated via electrolysis is more expensive, but that is only needed for long trips). More importantly, even if the H2 is more expensive relative to gas, the fact that the car is five times as efficient (100 mpg for the PHEV vs. 22 for a gas car), means that the total fuel cost for a consumer goes down.

Also, we shouldn't write off BEVs at all. We're going to need every viable solution we can get. BEVs are much more efficient that using electricity to make H2 burned in an ICE. Tesla is now proving that the only disadvantage of BEVs is the fueling time. As batteries get better, our PHEV fueled with H2 starts looking more and more like a BEV. We should certainly encourage automakers to follow Tesla's lead. I drive a BEV every day that has less than half the range of the Tesla. Once every 2 months I need the range of a gas car.

It is just amazing to me how we currently spend public money to incentivize behavior that is adverse to the public interest. **If we just STOP subsidizing these really bad fuels and just let the free market work on its own, the switch to clean fuels for transportation will happen on its own**.

If the price of gasoline was adjusted to reflect its true economic cost, it would be a non-starter. From Plan B 2.0 p. 16:

> "A similar situation exists with gasoline. In the United States, the gasoline pump price was over $2 per gallon in mid-2005. But this reflects only the cost of pumping the oil, refining it into gasoline, and delivering the gas to service stations. It does not include the costs of tax subsidies to the oil industry, such as the oil depletion allowance; the subsidies for the extraction, production, and use of petroleum; the burgeoning military costs of protecting access to oil supplies; the health care costs for

> treating respiratory illnesses ranging from asthma to emphysema; and, most important, the costs of climate change.
>
> "If these costs, which in 1998 the International Center for Technology Assessment calculated at roughly $9 per gallon of gasoline burned in the United States, were added to the $2 cost of the gasoline itself, **motorists would pay about $11 a gallon for gas at the pump**. Filling a 20-gallon tank would cost $220. In reality, burning gasoline is very costly, but the market tells us it is cheap, leading to gross distortions in the structure of the economy. The challenge facing governments is to incorporate such costs into market prices by systematically calculating them and incorporating them as a tax on the product to make sure its price reflects the full costs to society."
>
> from p. 77:
> "Many subsidies are largely hidden from taxpayers. This is especially true of the fossil fuel industry, whose subsidies include such things as a depletion allowance for oil pumping in the United States. Even more dramatic are the routine U.S. military expenditures to protect access to Middle Eastern oil, which were calculated by analysts at the Rand Corporation before the most recent Iraq war to fall between $30 billion and $60 billion a year, while the oil imported from the region was worth only $20 billion."

We need only one core strategy. The strategy should be technology neutral within a framework. For a national electrical grid, we don't care how you generate the power so long as it is carbon neutral or better (carbon taxes will make it uneconomical to run unclean plants). For ethanol, we don't care how you make the ethanol so long as it is carbon neutral or better. For H2, we don't care how you make the H2 so long as you don't emit CO2 in the process (so if you make it from natural gas, you'd have to pay the addition expense of sequestration added to your cost).

There are a wide range of things we can do. Some are quite controversial. For example, Monbiot argues that ethanol and biofuels can actually make the problem worse, not better. Others such as Khosla disagree. Who is right?

The answer is both are right. Burning biofuels in power plants equipped with CO2 sequestration would, according to Hansen, reduce CO2 in the atmosphere. Cellulosic and sugar cane based ethanol is significantly better than corn-based ethanol, but it all depends on how the corn based ethanol is produced. Some think that there is not enough land area to convert our vehicles to cellulosic ethanol, while others think there is. From a health point of view, a Stanford study says that ethanol could be worse than gasoline.

Similarly, some people think nuclear should be part of the mix. Others, such as Lester Brown and Greenpeace (in a new study) disagree because of cost reasons. More significantly, Germany is moving from nuclear to wind, so that should tell us something!

In any case, we better make damn sure we know the answer to that because we don't have a lot of time and we can't afford to be incentivizing things that make the problem

worse. And if our best scientists can't agree, then the safest and only logical course is to pick something which CAN solve our problem and which we do have consensus on. For example, everyone agree that wind, solar, and geothermal solutions generate no GHGs.

We need to appoint a trusted panel of our best scientists, give them the goal, and allow them to come up with a business plan of strategies and frameworks for innovation that fit together to achieve that goal, free of political interference. And then those approaches must pass independent peer-review. And we don't have a lot of time. They would determine how much government should get involved and where. In some cases, they'll set standards and be technology neutral; in other cases, they'd help break chicken-egg problems. With a plan, we won't end up with a hodge-podge of solutions that may be at cross purposes with each other and/or confusing or conflicting. That is why **we need a unified strategy**. So we can spend our funds on the most promising and most efficient strategies to achieve our goal.

We **can't tell people to row in different directions if we want to maximize of chances of success**. Do we incentivize gas, hydrogen, or ethanol? Raising CAFÉ standards is a good thing and we should be continually raising them, but it must only apply to fuels that emit carbon and should be replaced with a carbon standard per mile. For hydrogen, the "miles per gallon" requirement then becomes irrelevant as far as GHG emissions are concerned. And if we want ethanol to take off, government needs to break the chicken-egg problem with the supply, e.g., GM has sold 1.5 million flex-fuel vehicles, there are more than 5 million total vehicles from all manufacturers, but in California, there are only about 4 ethanol filing stations and I think only 2 of those are open to the public. The entire country has slightly over 500 stations.

And for certain solutions, free market solutions such as **cap and trade will never get us there**. There must be government regulation in order to break certain chicken-and-egg problems such as hydrogen. Just like Brazil, if we want to become energy independent and meet our goals, government must pick a strategy and make a bunch of strategic bets. Government must lead the way if we are to take action quickly. **Brazil would probably never have become energy independent without government intervention.** Certainly, there is no case of any other country making such a dramatic shift based only on market forces.

In short, if we are to pull this off, **government must make some strategic bets and intelligent decisions** rather than sitting on the sidelines and let the market try to sort things out.

A word about "efficiency" (especially regarding H2 as a fuel)

From Terry Tamminen:

> It's worth adding a dose of reality to the sometimes theoretical exercises we all play when it comes to climate policy and clean energy. Make no mistake, I am not advocating for inefficiency, but the reality is that you can't name anything in life that is 100% efficient or in most cases is even the most efficient choice among

> many, especially when it comes to energy. If efficiency were the primary goal of human endeavor, we would not use fossil fuels at all (or at least they would be priced to reflect their true cost and thus motivate less waste) and Bush would not be president. We can all sling around our stats about why this technology is better or that one is less efficient. Most of them will be wrong, because in trying hard to sell our vision, we glibly assume technologies or efficiencies or pricing that is simply unrealistic. In sum, we will not end our addiction to oil (and coal) until we recognize that our energy demands are so vast that we must embrace a suite of fuels and technologies, trying always to make them more efficient over time. In our closet, we have a $20 pair of jeans at one end and a $500 tux at the other. One does not cover our bodies more/less efficiently, but we are willing to pay more for one because efficiency alone does not motivate our lives. It's time we start realizing that we need a full "closet" to meet our energy needs - - assuming we are prepared to completely evolve beyond fossil fuels, not just accept 100 mpg machines that are still powered by them - - and that the debate about which item in that closet is more/less efficient is less relevant than a host of other factors.

Political will is the limiting factor

Monbiot comes up with an aggressive GHG reduction goal and concludes that he has proved the methods he advocates are both technically and economically feasible, but he has not proved that it is politically possible since that is up to us, and not him (see p. 212).

From what I've learned, I'd agree with that. It appears technology is not the limitation. Give me any coal plant, and I'm certain can add CCS well within 10 years. Give me any auto and I can convert it to run on E85 in less than a day. So it is not technology, it is just **a question of scale**, e.g., can we scale ethanol to power all our cars in 10 years? Not likely all cars; maybe 30% at best say some experts. **Given the right incentives, it seems that achieving a 30% GHG reduction within 10 years is actually technically achievable**.

To beat global warming requires international cooperation. It is unlikely we can save our planet if in the next 10 years we act alone because by then the bar will be set too high for others to achieve. **The sooner we engage others in this effort, the less we all have to cut and the lower our costs will be.**

The longer we delay, and the less aggressively we cut, the harder it will be for everyone. We may already be too late.

But have you noticed that the leading environmental groups haven't called for a specific 10 year goal? Have you seen the cost-benefit curve analysis that would allow us to determine what the right 10 year goal for the US should to be? I haven't. Nobody I've asked has. It doesn't exist. That's a real problem! Hard to set a goal if you don't know the cost-benefit tradeoff, isn't it?

My foundation donates generously to environmental causes so I get access to the top people at the environmental groups. What they tell me is that they will not advocate something that they perceive is not politically possible. They do not want to take an environmentally responsible position if it results in their views being marginalized as "out on the fringe" and if the position is so extreme that they cannot get political support for what they advocate. So they are focused on 2050 which is the centerpiece of Boxer's bill in the Environment and Public Works (EPW) committee because it seemed to be the easiest way to get something done in this Congress with this lame-brain President we have. They'd like to do more faster, but they reason (correctly!) that some forward progress now (with this President) is better than getting nothing done now and hoping for a Democratic President in 2008. Ideally, they can get the Sanders-Boxer bill passed.

All of this is perfectly reasonable. But it is not good enough for this particular problem.

Al Gore was dead-on right when in his NYU speech he declared that **global warming requires us to re-define what is "politically possible."**

That's because it is such a huge problem, because it requires international cooperation to solve, because we have only 10 years to both pass legislation and implement it, and most importantly because **global warming never creates a crisis**. Global warming is not like cooking on a gas stove. It's like heating a huge swimming pool. There is a 30 year time gap from when we put the warming into the atmosphere to when we start experiencing the resulting temperature rise which means that politicians can't see the urgency until it is 30 years too late to do anything about it. Every other crisis happens immediately.

It's like the frog in the pot of boiling water; if you raise the temperature gradually, **the frog never figures it out until it is too late**. Now the tables are turned and **we are the frog**. It remains to be seen whether we are any smarter than the frog. Right now I am extremely worried.

The 30 year time delay is caused by the thermal inertia of the oceans. It's like heating a large swimming pool. The CO2 level is like the thermostat of your pool. You set the thermostat and it takes the pool 30 years to heat up. Well, our thermostat is set on "super warm" today and 30 years from now, we're going to see about 50% of that impact (it takes over 100 years to see the entire impact). Katrina was just a warning shot over the bow over what is to come. It was just the tip of the iceberg that we saw.

But if you adopt an aggressive 10-year US and worldwide GHG reduction goal as a centerpiece of your campaign, **you have the power to re-define what is politically possible**.

In fact, you are one of only about 5 people on our planet who has enough political clout to do this. But we should remove the current President since he'd never do it, so we're down to 4.

I listened to the Senators talk on January 30, 2007 when Boxer took their temperature on this issue.

The big problem is the Senators focused on strategies. No Senator talked about what the goal should be. Yet the goal is the most important thing to get right. Set too low a goal (too far out in time or not enough) and the planet is likely toast. The goal got no air time.

However, Senator Kerry said: "We have a 10 year time window to fix this problem."

Exactly right. **If we don't make dramatic progress in the next 10 years, then our options after that point are practically non-existent**. What happens then is there is no way to avoid 450 ppm and when we get near that point, ecosystems start breaking down and systems that use to absorb CO2 now start to emit CO2. It becomes a runaway train.

So where is the all important 10 year goal? It was not discussed in the Senate hearings.

However, a ten year goal is in the Sanders-Boxer bill (S.309) in Sec. 704(b) which sets a goal of achieving 1990 emissions levels by 2020. That's a certainly a good start, and a lot better than we have now, but it's not nearly good enough to give us even an "even chance" of averting irreversible climate changes as you'll see below. And it's not the best we can do. We can do better.

You know that it is morally, ethically, and economically, the right move for our country to advocate for such a goal and to take aggressive action NOW.

The environmental groups are hoping you will lead by setting an aggressive 10 year global GHG reduction goal. I am hoping you will lead. We are all hoping that you will lead. And if you lead by setting a high bar for the world, we will follow. But only if you lead.

I received an e-mail from Fred Krupp, President of Environmental Defense today asking him for his support if you took a very aggressive 10 year goal for GHG emission and he said that if you set a high bar for 2020, that Environmental Defense will support you and encourage their colleagues to do the same. Here's what Fred wrote to me:

> You are correct, life on earth is imperiled and **there is a need for bold leadership**.
>
> We would praise, not skewer, any **candidate who calls for steep cuts soon**. We would work to get our colleagues to do likewise, and I think they would. He, and others running, need not be concerned that they could call for cuts that wouldn't have wide support from us.

A youth climate activist wrote to me:

> ED, NRDC and the rest of the big national enviro groups can't do too much to rapidly 're-define what is politically possible.' We'll push the leading edge, but can't stray too far ahead. If that leading edge moves, we'll all move with it and continue to push for the most aggressive proposals out there (and probably a bit more!). But we need the political center to move a bit forward before we can move farther forward, and someone like Edwards and can really help do that.

First, note that this is NOT a US-only goal. It is a **worldwide** goal that the US must adopt. The US must set a goal for itself, meet that goal, then aggressively incentivize and help others to follow our lead.

This is not imperialism; this is not the US imposing it's will on other countries. This is the US saying "OK, we agree with the Intergovernmental Panel on Climate Change (IPCC). We will play along with what our countries want and help them to achieve it."

The US must lead because if we don't, nobody will follow. And then we must convince others to follow our lead. If they don't, we are all doomed. And it will be too late for anyone to do anything about it.

Your first priority is to get the votes you need to get elected. It may be smarter to package this goal as being about "energy independence," lower gas prices, and a stronger economy in order to win the election and set this as a goal after you are elected.

However, based on the response of focus groups, **the equation changes if you are not a lone voice calling for this goal**.

If you have support from the top CEOs of American companies, the entire dynamic changes. Support of environmental groups is icing on the cake, but the support of the business community is critical to making this work as an issue in this campaign.

Nobody's asked businesses to set GHG goals, but they are doing it on their own! And top business people, such as Rob Walton, Chairman of the Board of Walmart, are very receptive to fixing the global warming problem and can get others to follow if you take the first courageous step and say you are willing to lead. For that is the true test of leadership: setting the right goal for the country (in this case the world), and then enlisting others in support of your goal. And you could even get support from CEOs of companies from around the world. Richard Branson would probably be one of your first calls and he'd probably welcome the opportunity to enlist other worldwide CEOs in support of this goal.

The goal you adopt for global warming is the single most important decision that you will ever make in your life. In fact, it is probably the single most important decision in all of history because affects the future of the entire planet and the lives of billions of people, not to mention 90% of the living species on this planet.

I believe that the worldwide goal you set for GHG reduction should be your "signature goal" because no other goal comes even close to being as important to both the country and to the world.

It may take a while to convince Americans of this, but the more you are attacked for taking such a position, the better you look and the worse your attackers look because you have the truth (and the business community and scientists) on your side. It's simply the more responsible and safe position to rapidly eliminate our dependence on fossil fuels both from an economic, health, and world stability point of view.

The timing is right; an aggressive stand is now supportable

As I write this in Los Altos Hills, CA, I hear on the news that the temperature set today in my area is a new record. And I know things are only going to get worse and worse every year.

The stars are aligned into a perfect storm.

> "What was considered left a year ago is now center, and in 6 months, it will be conservative --- that is how quickly the debate about climate change is moving here."
> -- Michael Roux, chairman of RI Capital, a Melbourne investment firm

Consider the following headlines (all true):

- North Pole to melt completely in less than 30 years
- Amazon suffering worst drought in 40 years
- Three countries are planning to build nearly 850 new coal-fired plants, which would pump up to five times as much carbon dioxide into the atmosphere as the Kyoto Protocol aims to reduce
- Without water and the ability to move it efficiently over hundreds of miles --to cities, suburbs, farms and factories -- California would be unrecognizable as the fertile, vibrant state it is today. Already, scientists say, there are clear signs that global warming will put that vital flow in jeopardy.

In Thomas Friedman's column entitled "Parched Australians demand solutions to global warming," the Australian Prime Minister was quoted as saying:

> "if it doesn't rain in sufficient volumes over the next six to eight weeks, there will be **no water allocations for irrigation purposes until May 2008**."

Do we want to end up like Australia who is now getting a small taste of global warming? Don't we want to avoid that to the best of our ability? For everyone on the planet, it's only going to get worse every year as the average temperatures rise at an ever increasing rate.

We're next if we don't take **dramatic** action now. Can you imagine that headline in the US? You won't have to. It will be playing soon in a city near you. As I'm writing this, I just heard on the news that Contra Costa County has experienced the driest year on record. Uh oh.

Today's Mercury News front page lead article: "Bay area gas prices shattering records: Fuel soars to 3.61 in SF, surpasses $3 in 19 other states." **How can the timing be any better to start talking about real solutions to both our oil addiction and the threat of global warming?**

And what is perceived as "affordable for our economy" will increase every year with each new disaster. Global warming just got a lot more "affordable" in Australia with the real threat of no water until May 2008! The meaning of "affordability" ultimately becomes a question of how much are you willing to invest to save your own planet from an environmental melt-down?

So far, the climate change debate has centered on how much it will cost to do something about climate change. The question everyone forgets is how much will it cost to do nothing? As Australia is discovering, and as the US discovered after Katrina, the cost of inaction is simply staggering.

According to scientists, all the ice in the North Pole will be gone in less than 30 years. We should find this terrifying.

But there are many other benefits of doing this quickly beyond just the environmental benefits. These benefits include the creation of millions of new American jobs, cheaper fuel costs, and independence from foreign oil. **And it would provide a great way to position yourself clearly as being well above your opponents in this critical issue.**

The cost to avoid the tipping point is estimated at less than 3% of GDP over 20 years. If we don't act, the cost is between 5 and 20% of GDP every year according to a British government report last year.

The characteristics of great goals

I think it was President Clinton who advised Kerry to adopt one or two "signature goals" that would define his campaign. It was good advice. As I recall, Kerry never took that advice because for the life of me, I can't recall what Kerry's signature goal was. My friends (who voted for him) can't recall what his goal was either. Can you?

Kerry didn't take President Clinton's advice and he lost the election. I hope you will not make the same mistake.

I urge you to follow the lead of JFK. Can you believe it that in the past 50 years that the only bold visionary 10 year goal for our country that most people can remember was the one JFK laid out 46 years ago?

I can remember it today almost word for word and I was only 5 years old when he made it.

JFK said “I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the moon and returning him safely to the Earth." It was a great goal for several reasons.

First, it was a well- formed goal because it met the 3 prong test:

1. simple
2. specific (and it even had the “return him to earth” part!)
3. measurable (e.g., a fixed time limit)

I see goals all the time from our lawmakers and all too often they fail one or more of the 3 prong test. JFK’s goal met all three prongs. And as icing on the cake, it was a one sentence goal that satisfied the 3-prong test so it was easy for us to remember. I know lots of people that remember it 46 later. You can’t do better than that.

The goal I suggest you adopt above also satisfies the 3 prong test. And it stands alone as one sentence, just like JFK’s goal.

There are 5 other prongs of great goals:

1. They set the bar high; they challenge us to do better than we currently think is even possible; they set higher expectations than we’d set for ourselves and they require some sacrifice. When was the last time a President asked the country to make some sacrifices? People respect that. In fact, a lot of people I know are really unhappy that Presidents don’t do this.
2. They inspire us to do our best
3. They are important to achieve
4. They are memorable
5. They specify the goal only and leave the strategies for others to figure out

Again, JFK’s goal met the second 5 prongs. It was important for national pride for us to beat the Russians. The JFK goal was seemingly impossible at the time. We had no idea how to achieve it. But JFK expected greatness and the nation delivered. We rose to meet the challenge and even exceeded our own expectations.

That’s what we have to do now with global warming.

We need someone to take a stand to tell the public the truth about just how bad it is right now and to level with the American people that we have to achieve this aggressive goal you have laid out within 10 years because even though we will have to make some sacrifices now, the total cost of addressing the problem grows geometrically every year

(becoming infinite in 10 years) so that the sooner we take steps to fix the problem, the less it will cost us.

So it simply makes economic sense to invest now rather than later. Because this problem will not go away and it is unavoidable. We either "pay the piper now" or we pay the piper *a lot more* later. And if we don't pay the piper within 10 years, then no matter how much we pay the piper it won't matter because it will be too late. So **aggressively addressing the issue now results in a cost savings** compared to the costs of doing nothing.

Most politicians don't like to tell people bad news. They put it off for later. Until it becomes a crisis.

We're at crisis stage now. It's just that you can't see how bad it is due to the "time delay." But if you look at CO2 concentrations today, you can see that we have a serious problem as the concentrations now are ridiculously higher than at any point in the last 500,000 years (in *Inconvenient Truth*, it was the part when Gore got on the ladder).

We are way late and we need to take DRAMATIC steps to reverse the damage, not baby steps to "avoid the worst consequences of global warming" as some people advocate.

Because if YOU tell America that we can beat global warming, America will rise to the challenge. But you must set the goal high enough so we can win. And you must BELIEVE in America to accomplish it. And to date, not a single environmental group or Presidential candidate has done that.

Why the scientists can't tell you what the goal should be

First of all, **our scientists cannot set a goal**. There is too much uncertainty as to 1) where the tipping point actually is (we may have past it) and 2) what other nations will do. And even if both could be determined with 100% certainty, then you are still left with a cost-benefit tradeoff at a minimum. **The scientists can tell you what the cost-benefit curve looks like, but they cannot tell you which point you should choose. That is a political question.**

It's like asking an economist, "How much car insurance should I buy?" Well, the more the better, but at some point, you're probably wasting your money, but it's really a personal decision as to which point you are comfortable with on the cost-benefit curve.

In this case, we're not only confronted with a cost-benefit tradeoff in setting the goal, but we are also confronted with political uncertainty: if we ask for too much, it's a non-starter. For example, asking Americans to give up their cars for battery electric vehicles with a 100 mile range and 5 hour filling time is unlikely to be a viable strategy.

So the scientific answer to the question "how much do we need to cut?" is simply this: **the faster and deeper you cut in the next 10 years, the better your chances of**

averting a tipping point. I don't think there is a single responsible climate scientist that would disagree with that statement. And therein lies **the way to justify the position you take from a scientific point of view.** But you need to understand the costs as well.

So now we are left with the question, "ok, how much can I cut within 10 years if I'm willing to invest about $100B/yr and I need the public to support it?" That's both a political and scientific question so you must ask it of a group of scientists (to determine what strategies could be done for that money) and political advisors (to determine which strategies could be packaged in such a way that the public would support them).

Our leading scientist in this area, James Hansen, testified just 2 days ago in front of Boxer's EPW committee:

> Note that **I do not specify an exact fraction by which CO2 emissions must be reduced by 2050 or any other date**. Indeed, science is not able to specify an exact requirement now, but we can say that emissions must be reduced to a fraction of their current values.

That's a very responsible answer. Climate science is not an exact science. It is extremely complicated and there are many unknowns.

Indeed, when "StepItUP 2007" ran their successful "80% by 2050" campaign, they admitted the following on their website:

> While few experts have said explicitly "we need to reduce carbon emissions 80% by 2050," we're sticking to this message. Here's why: Scientists have resisted in nearly every case prescribing policy because they don't want to enter the political realm. That's why the Intergovernmental Panel on Climate Change (IPCC) and others won't suggest policy, but rather leave it up to legislators to do the dirty work. That said, Jim Hansen, the Stern Report, the UN Framework Convention on Climate Change (UNFCCC), a number of European countries, the State of California and others (including the new USCAP business-environmental partnership) have either suggested or explicitly referred to 80% carbon cuts by 2050 as a solution commensurate to the scale of the problem.
>
> http://stepitup2007.org/article.php?id=29

And any goals recommended by the IPCC (note that they don't recommend any goals) will be much too conservative because: 1) there has to be consensus among all the scientists for anything to get into the report and 2) governments (in this case the US, China, Saudi Arabia, China, and Russia) censor or re-write the Summary for Policymakers portion of the IPCC report before it is released. For example, according to an AP story on May 1, 2007, instead of saying action must taken in the next 2 to 3 decades, the US will try to replace that with "action must be taken before the end of the century." True, but hardly accurate.

But the point StepItUp makes about scientists sticking to the science is right. Some want the lawmakers to set the goals. But in other cases, they are threatened with their jobs if they talk about policy. The *New York Times* reported that our leading scientist in the global warming area, Jim Hansen, was told that there would be "dire consequences" if he continued to call for rapid reductions in greenhouse gases. After Martin Durkin's film that attempted to discredit global warming was broadcast, one of the scientists it featured, Professor Carl Wunsch, complained that his views on climate change had been misrepresented. Wunsch says he has now received a legal letter from Durkin's production company, Wag TV, threatening to sue him for defamation unless he agrees to make a public statement that he was neither misrepresented nor misled

So what context do lawmakers have to set a goal? They can't do the mathematical calculations and analysis required to figure out where to set the goal. There is no cost-benefit curve anywhere for them to pick a point.

And furthermore, even if they could decipher all the scientific data to come up with a responsible goal that would solve the problem, lawmakers don't want to set any goal that is too aggressive now because they need the votes to get the legislation passed.

I e-mail Barbara Boxer on a regular basis and when I tell her that the 2050 goal is too weak, she emails me back that, in essence, it is all about getting the votes. She's focused on getting something passed. Good for her! She's right of course. And it would be great to get her bill passed. It's a good step in the right direction. But it is not enough because it isn't aggressive enough. And it's not aggressive enough because she needs the votes. I can't disagree with that. Some progress is better than no progress (unless Congress thinks by passing this bill they are done with climate change). But it is not enough to succeed. **What Boxer is doing is necessary and I'm glad she's doing it. But it is NOT sufficient. Not by a long shot.**

But you have the power to change that. It sounds silly to write this, but I believe you have the power to save the planet.

If you adopt an aggressive GHG goal as I laid out above, we actually have a chance of completely avoiding the catastrophic effects of global warming.

But if you do not, then I'm afraid it's all over because I am not optimistic there is another way that the US is going to adopt the goal it must adopt. It must happen in the 2008 election.

As for that 80% by 2050 goal, here's what the scientists are saying about that (from a Reuters story 9 days ago):

> "If we are to have a 50 percent chance of meeting a 2 Celsius target we would have to cut global emissions by 80 percent by 2050," Nathan Rive of the Center for International Climate and Environmental Research in Oslo told Reuters.

> "Any delay in implementing emissions reductions will make a 2 degree target practically unreachable," he and colleague Steffen Kallbekken wrote of findings to be published in the journal Climatic Change.
>
> The EU reckons that there would be dangerous disruptions to the climate such as ever more droughts, heatwaves, floods and rising seas beyond a 2 C ceiling. Temperatures already rose by about 0.7 Celsius in the 20th century.
>
> An 80 percent global cut **would mean rich nations**, responsible for most heat-trapping emissions from fossil fuels burnt by power plants, factories and cars, **would have to axe emissions by about 95 percent below 2000 levels by 2050**.

In short, if we are to have a 50% of avoiding catastrophe, then the US must cut by 95% below 2000 levels by 2050, not 80%!

But who wants to aim for a 50% chance of catastrophe?

Why are we setting our goals so low that we have a 50% chance of success? That is preposterous. Is this the best our leaders can do? Lead us to failure?

And **a 43-year goal is silly when progress must be done in the first 10 or it's all over**.

And the more progress we can achieve in the first 10 years, the easier and less expensive it will be for us later, i.e., the more we cut now, the less we have to cut later.

We need a leader to step up and to set the bar so we have the best chance of success.

Look at the impact of just one global warming catastrophe: Katrina. Damage estimates are over $100B for just one global warming "event." And that is just the tip of the iceberg for what is coming.

So the economic cost even today is enormous. Imagine what it is going to be like if we lose the 50% chance!!

That means that your competitors in this race such as John Edwards who advocate for an "80% reduction by 2050" are setting the bar way too low.

The environmental community agrees: the next 10 years are critical.

That's why your leadership is required.

You need to challenge America to WIN the war on global warming by inspiring them by setting a high goal; a goal that if they achieve it, we can avoid the catastrophic tipping points that Hansen warns us about.

You have an opportunity to rise above all the other candidates in this race. You will set yourself apart from the others who set a goal so low that even if we achieve their goal, we only stand a 50% chance of winning. Who wants that? And you can make it clear to the American public that your opponents are basically advocating flipping a coin with our futures while you will fight to actually get the job done.

I want to win. We need to win. And we need someone who has confidence in America and who has high expectations to allow America to win. We need someone who will root for America to win. Someone who will inspire us and cheer us on to victory, not someone who guides us to a 50% chance of avoiding the most catastrophic effects.

I don't want to vote for a candidate who is resigned to lose the global warming battle because they refuse to challenge America to rise to the task.

You can set a goal that allows us to win and you will inspire hundreds of thousands if not millions of people to work with their heart and soul to get you elected. Because those people realize our world is at stake. One youth activist wrote me:

> True. If any candidate separated themselves from the pack on this issue, I for one would dedicate myself to getting them elected! And I know many others who would as well.

But right now, there is nothing to get us engaged. People are looking for a candidate who believes in this country, who has faith in the ingenuity of the American people, and who will lead us to victory in this battle against global warming. Wouldn't it be great if a candidate said something like this:

> "If I am elected, I will heed the advice of virtually every climate scientist in the US. They all tell us if we are to have the greatest chance of avoiding catastrophe, we should cut our GHG emissions as fast and as deep as possible. My opponents aren't doing this. They are ignoring this advice and are recommending we respond over the next 43 years. This is irresponsible. I have set for our country a **bold and aggressive goal** to win the war on global warming. I've outlined a way that we can do in only 10 years what my opponents promise to do in 43 years. I think there are other strategies that may be even better. But America can do this under my leadership. And the sooner we do this, the sooner we reap the economic benefits. And under my plan, we'll create millions more new jobs in America than under their plan. etc. etc."

America needs this leadership. The world needs this leadership.

Leaders set specific goals. They leave the creation of strategies to others and then they decide which strategies to implement. So when you are elected, I hope that you assemble our smartest minds (e.g., National Academy of Science) and ask them to come up with a business plan for how to achieve the goal. And then have other non-partisan groups and leading experts (like Amory Lovins) validate that plan. And then you'd implement the plan rather than ignore it as so many politicians tend to do (which is why people I know

hate serving on blue ribbon committees because they work their butts off only to find out that their advice goes nowhere).

And in the meantime, America's CEOs, scientists, environmental groups, and our leading universities will validate that your goal is achievable, and it is responsible from both an ethical, moral, and also economic grounds. So you'd have credible support for your position.

Also, setting high goals will cause us all to think differently about solutions and what is "possible." For example, if we have to cut by 30% in 10 years, lots of things don't get us there. **And things we'd never consider before start looking like the best options**. Wind power is a great example. We have enough wind power in this country to power the entire country 24 x 7 since if you build out in enough places, there is always guaranteed to be sufficient wind 24x7. You'd have to over build to do that, but it's possible. And with a national electric grid, you can take that power from the central states and deliver it where it is needed. And wind power can be deployed extremely quickly: within a matter of years. But you'd probably not consider a national electric grid and rapid deployment of massive wind farms as part of your strategy if you have a 43 year goal because in that case, you'd do more incremental things. The more aggressive goal forces us to consider things we wouldn't consider otherwise; things that would cost us relatively more in the short term than a longer term goal would require, i.e., we'd invest the same dollars, but invest them all "up front."

And it will cost us more to cut a lot faster, no question about that. But Terry Tamminen's book points out that we currently spend close to $100B *per year* on subsidies for fossil fuels. If we just diverted those funds, we'd have lots of money to pay for this. And the cost of a single global warming incident makes the economic investment prudent. The sooner we invest, the lower the cost.

George Monbiot's *Heat: How To Stop the Planet from Burning* has put together a case for cutting Great Britain's carbon production 90 percent by 2030, and details how to do it. His is a more severe and faster cut than anyone is proposing presently at the legislative level; Monbiot makes the case that anything less will not prevent us from moving past a tipping point (if we haven't already).

How come other people aren't suggesting this?

You might ask, "if this is such a great idea, why aren't other people proposing I do this?"

Well, in fact, they are!

Bob Geldof was recently quoted in articles on May 14, 2007:

> 'I would only organize ["Live Earth"] if I could go onstage and announce concrete environmental measures from the American presidential candidates, Congress or major corporations," he said. "They haven't got those guarantees, so it's just an

> enormous pop concert or the umpteenth time that, say, **Madonna** or Coldplay get up onstage."

After I wrote all the text above, I read an op-ed in the San Jose Mercury News on April 29 on the front page of the opinion section entitled, "U.S., China should take lead in global pollution solutions." The op-ed was authored by Orville Schell who is the Dean of the UC Berkeley School of Journalism, the author of 14 books, nine about China. He suggested a strategy that is amazingly similar to the suggestions I had just written. The same op-ed also first appeared in the *Washington Post* on April 15. He wrote:

> But justice or no, the world is left to confront a situation in which the two largest polluters have opted out of the solution. If the United States will not lead, China will not follow, and the results will be tragic: Both countries will suffer grievously, and so will the rest of the world.
>
> What, then, is to be done?
>
> The next U.S. presidential election will present a fleeting moment of opportunity, **if only the candidates can be persuaded to commit themselves to pursuing a major new cooperative effort to tackle our common problem**.
>
> What could be more promising than our leaders jointly seizing the reins of lapsed global leadership and guiding our two countries, and the world, out of this impasse? Interestingly, **both countries are in need of a rebirth of national leadership**: the United States because of the miasma of Iraq and the Bush administration's foreign policy, and China because of its failed Marxist revolution, whose vestiges it has still not been able to shed entirely.
>
> How should we proceed? By forming a coalition of respected scientists, business leaders and policy experts, calling a high-level emergency summit with their counterparts in China and then **enlisting the U.S. presidential candidates to pledge to make the coal/climate change issue a priority**.

I asked a group of voters their reaction to this and they said that global warming is just one of the issues and a candidate can't run a single issue campaign. A candidate who just talked about a goal for global warming would not be credible in their mind because it is easy to talk about goals. But if a candidate had a goal that would fix global warming and could articulate a strategy for achieving that goal, and had endorsements from the business community of that strategy, that such a candidate would be a miracle worker and they would definitely vote for that candidate instead of the candidate they are currently supporting.

The changes can also be justified based on the positive economic and health benefits to our society which I've outlined above. These positive 'carrots' should be a major part of how any carbon reduction goal is packaged and sold to the American public. It's about a)

avoiding doom and gloom global warming, but also about b) making America stronger, safer, healthier, richer and more competitive than it is today!

Some questions we should ask the Presidential candidates

2. Will you adopt a goal of cutting GHG emissions by **at least** 30% from 2009 levels by 2020 and encouraging other nations to do the same?
3. Will you make that goal a centerpiece of your campaign?
4. Are you willing to set a goal for the US higher than the 30% that our leading experts say is achievable and inspire the US to achieve a higher goal than many think is possible? A tougher goal, if the rest of the world follows our lead, would allow us to stop temperatures from increasing at an ever increasing rate in less than 20 years (at which time they would still increase, but at a sub-linear rate instead of a super-linear rate).
5. If credible experts in this field believe a 30% GHG reduction by 2020 goal is possible to achieve, and the costs to our economy to achieve this reduction is estimated to be less than $100B/yr, will you adopt this as a goal in your campaign and do everything in your power to achieve that goal if elected?
6. Will you make combating global warming the top issue of your campaign? Note that the goal can be positively positioned as creating jobs, strengthening our economy, and energy security by reducing our dependence on foreign oil.
7. For countries that choose not to voluntarily reduce their GHG emissions, will you impose sanctions in proportion to the amount of non-compliance, e.g., a carbon tax or some other type of economic sanction that makes goods and services from other countries more expensive in proportion to the amount of GHG emissions from that country?
8. If a country refuses to reduce its GHG emissions even after the imposition of economic sanctions and their emissions continue to increase, are you willing to cut off all trade with them until they comply?
9. Are you willing to go on the record that if you are elected that you will end all tax breaks and government incentives related to the production of fossil fuels and instead re-allocate those funds to incentivize the development of clean and renewable sources of energy?
10. Are you 100% committed to creating a new path to clean renewable energy, which will protect our children, re-energize our economy, and create a bright future for America?
11. My vision is a future where all the stationary power is renewable and clean (no GHG), and all transportation is powered by 100% renewable clean fuel. Do you share my vision? Are you willing to share your vision of what energy will look like in 30 years from now with the public?
12. Would you be willing to set a 30 year time frame for power companies and car companies to move to virtually 100% clean power and transportation? If not, then over what time frame would you set?
13. Suppose cutting GHG emissions by 30% by 2020 costs more than was budgeted. Are you willing to do what it takes to get the job done regardless of cost? If not, then how do you put a price on the future of the planet?

14. Would you support bringing CAFÉ standards be higher than the requirements in Europe and China, i.e., above 45 mpg by 2008
15. Would you create a Manhattan Project for energy? How much would you fund it with?
16. How much would you invest in foreign countries per year to help them reduce their GHG emissions?
17. The business plan of how we are to achieve the global warming goal you set for the country and the world may be the most important business plan ever written. How will this plan be created? Will you have a blue-ribbon panel of non-partisan experts prepare the plan? One of our top universities?
18. And now the most important question of all: Are you willing to take a position on GHG reductions that is beyond the 30% in 10 years, i.e., are you willing to challenge and inspire America to do cut emissions more than twice as fast as the rate required under California law? Are you willing to set a goal of a 60% reduction by 2020 which would, if the rest of the world followed our lead, cause GHG levels to stabilize by 2020? If not, how far are you willing to go?

Reader comments

Thomas Lovejoy is President of The Heinz Center He served on science and environmental councils or committees under the Reagan, Bush, and Clinton administrations. Here's what he wrote after he read this letter (emphasis is mine):

> As someone who looks (and has been looking for 20 years) at climate change through the lens of what it does to ecosystems -- the biological underpinnings of society -- **the issue is as urgent as you portray it, and probably more so**. There is enough change occurring in the natural world already (including threshold changes in ecosystems) that **I shudder at what the climate change already built in will bring**. So I believe 450 ppm is too high to avert big problems for some ecosystems. We are so close in CO2 equivalents that **we should not think about going up to some concentration level** and stopping there, but in addition then dropping below it.
>
> All that said I completely agree with the thrust of the letter. **The sooner and the more aggressive the proposal the better**.
>
> The caveats about biofuels are important if they are to make a contribution to the solution without causing additional problems. Also the mention of the importance of dealing with forests is hugely important. Currently 23% of global CO2 emissions come from deforestation.

Here's an email I got from an green blogger (commenting on an earlier draft where the goal was solely worldwide):

> Dear Steve,

Thank you for sharing the letter with me. It is outstanding. Steve Kirsch for President I say.

I really liked how you encourage X to set a bold and necessary GHG reduction goal - and 5 specific goals in general. It is true that X is currently weak on specific goals, and he would be wise to head your advice. I can't tell you what Kerry's goals were either.

It is also enlightening how you explain why scientists and NGOs have been unwilling to set a BHAG for global warming to date. They are waiting for the politicians, and the politicians have only been willing to think small and "feasible" and popular" so far; thereby selling the planet short. An excellent point.

It is so true that the war is a major distraction. I couldn't agree more. A mindshare, financial, and airtime black hole.

I love how you say "the U.S. must lead because if we don't, nobody will follow" and how you point out that "we either pay the piper now or pay the piper a lot more later." Again so true and such critical statements.

The following paragraph is excellent and could be positioned near the front of the letter it is so strong:

"The goal you adopt for global warming is the single most important decision that you will ever make in your life. In fact, it is probably the single most important decision in all of history because affects the future of the entire planet and the lives of hundreds of millions of people, not to mention 90% of the living species on this planet."

My only comments might revolve around:

1. The interrelationship between global warming and oil addiction, peak oil, and energy independence. If we move boldly to solve global warming, we will also be making a simultaneous dent in the current oil dependence and oil addiction crisis. They go hand in hand obviously. If we tackle one, we help to solve the other and vice versa.

As Thomas Friedman says, if we reduce our dependence on oil, we won't have to be in Iraq indefinitely (and pay billions of dollars) to maintain a stronghold over ME oil. It is essential for national security and will stimulate jobs here. As we reach peak oil worldwide, moving to non-fossil fuel sources of energy will both reduce global warming and increase energy independence.

2. The worldwide portion of the goal you advocate. You are suggesting a worldwide goal and global leadership from the U.S. I agree that this is 100% essential for planetary survival.

Global warming is such a tough issue because local emissions drive global warming, so we have to focus on the whole pie

worldwide to solve it. We need a bold Montreal Protocol for carbon. This is what George Schultz has been advocating for a while. Too bad nobody (i.e. you know who) has listened to him to date.

Solely a worldwide goal might be challenging for X because of the risk of seeming unfeasible for a new candidate, because he doesn't have direct control over the other countries. On page 10, you mention that an 80% global cut would translate into a 95% reduction for U.S.

Perhaps the signature goal could be two-part and stated in the spirit of "Reduce U.S. GHG emissions by X%, and work with foreign leaders to reduce worldwide GHG emissions by 80% by 2020."

There could be a specific goal for the candidate to state for the U.S. and for Americans to rally around locally. Many Americans are sadly very myopic as we know. And there could be a planet-wide goal for the candidate to emphasize in international relations - and truly fix the problem.

Was JFK's goal to put a man on the moon in general, or was it for the U.S. to put a man on the moon? I don't recall!

That said, I have been thinking a lot about our relationship to China. China as we all know is about to overtake us as the leading emitter of GHG gases. I hear people lamenting the 1 new dirty un-scrubbed coal-fired power plant per week in China, and I empathize. And China's maniacal focus on economic growth and resulting 11% growth per quarter.

But where is China's growth coming from? True it is centrally-government-mandated practically. But the U.S. economy and companies like Wal-Mart, which forced its suppliers to make goods in China or else, are at least partially responsible. Virtually everything is made in China now. So what do we expect? We want China to make everything at the lowest cost, and then we are shocked that they are belching GHG emissions into the air and poisoning our pets. It seems to me that if Wal-Mart really wants to fight global warming, they should have their suppliers make goods in countries with cleaner energy again.

Prices would go up slightly, but the planet would have a greater chance of being saved. Along with the new president's goal should come a message of sacrifice. As you say, "When was the last time a President asked the country to make some sacrifices?"

On another note, I love how you advocate for clean elections at the end. I am a huge supporter of this concept and of organizations like MAPLight.org that aim to expose the connections between money, special interests, and politics as a driver of reform. They are launching their U.S. Congress search engine in a few days.

http://www.maplight.org

Please let me know other ways to get involved in clean elections if you hear of any.

Imagine if the oil companies hadn't had a headlock over the government, what the Energy Policy Act of 2005 could have been. We would be much farther along with renewables right now. Sigh.

I hope that X wins too. But don't tell Y. :)

Thanks again for sharing with me and hope to meet you someday.

Best,
Nadine