

# How to Talk to A Climate Skeptic: Sample Responses

Coby Beck, a writer for [www.gristmill.grist.org](http://www.gristmill.grist.org), has put together a number of responses to common climate denial arguments (or “contrarian arguments”). We excerpted nine of Coby’s articles and three additional articles for use in our role-playing scenarios.

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## Part A: Science Topics

Notice how all of the responses in this section emphasize the weight of scientific evidence and/or clarify the nature of science. Explaining the science by itself is more effective than muddying the waters with opinion or hearsay. They also show when an argument is founded in scientific fact, but has an inappropriate interpretation.

### 'They predicted global cooling in the 1970s'

<http://gristmill.grist.org/story/2006/11/23/18534/222>

Posted by [Coby Beck](#) at 11:45 AM on 24 Nov 2006

Objection: The alarmists were predicting the onset of an ice age in the '70s. Now it's too much warming! Why should we believe them this time?

Answer: It is true that there were some predictions of an "imminent ice age" in the 1970s, but a cursory comparison of those warnings and today's reveals a huge difference.

Today, you have a [widespread scientific consensus](#), supported by national academies and all the major scientific institutions, solidly behind the warning that the temperature is rising, anthropogenic CO2 is the primary cause, and it will worsen unless we reduce emissions.

In the 1970s, there was a [book](#) in the popular press, a few [articles](#) in [popular magazines](#), and a small amount of scientific speculation based on the recently discovered [glacial cycles](#) and the recent slight [cooling trend](#) from air pollution blocking the sunlight. There were no daily headlines. There was no avalanche of scientific articles. There were no United Nations treaties or commissions. No G8 summits on the dangers and possible solutions. No institutional pronouncements. You could find broader "consensus" on a coming alien invasion.

Quite simply, there is no comparison.

If you want some additional detail, Real Climate has [discussed this](#), and [William Connelly](#) has made a hobby of gathering [everything that was written about global cooling at the time](#).

### 'Antarctic ice is growing'

<http://gristmill.grist.org/story/2006/11/4/211834/644>

Posted by [Coby Beck](#) at 9:28 AM on 06 Nov 2006

Objection: The Antarctic ice sheets are actually growing, which wouldn't be happening if global warming were real.

Answer: There are two distinct problems with this argument.

First, any argument that tries to use a regional phenomenon to disprove a global trend is dead in the water. Anthropogenic global warming theory does not predict uniform warming throughout the globe. We need to assess the [balance of the evidence](#).

In the case of this particular region, there is actually very little data about the changes in the ice sheets. The growth in the East Antarctic ice sheet indicated by some evidence is so small, and the evidence itself so uncertain, the sheet may well be shrinking.

But even this weak piece of evidence may no longer be current. Some [recent results](#) from NASA's GRACE experiment, measuring the gravitational pull of the massive Antarctic ice sheets, have indicated that on the whole, ice mass is being lost.

Second, ice-sheet thickening is not inconsistent with warming! Warmer climates tend toward more precipitation. The Antarctic is one of the most extreme deserts on the planet. As it warms, we would expect it to receive more snow. But even a whopping warming of 20 degrees -- say, from -50 degrees C to -30 degrees C -- would still leave it below freezing, so the snow wouldn't melt. Thus, an increase in ice mass.

While on the subject of ice sheets: Greenland is also growing ice in the center, for the same reasons described above. But it is melting on the exterior regions, on the whole losing approximately 200 km<sup>3</sup> of ice annually, [doubled from just a decade ago](#). This is a huge amount compared to changes in the Antarctic -- around three orders of magnitude larger. So in terms of sea-level rise, any potential mitigation due to East Antarctic Ice Sheet growth is wiped out many times over by Greenland's melting.

## 'Warming is due to the Urban Heat Island effect'

<http://gristmill.grist.org/story/2006/10/26/224634/48>  
Posted by [Coby Beck](#) at 9:31 AM on 28 Oct 2006

Objection: The apparent rise of global average temperatures is actually an illusion due to the urbanization of land around weather stations, the [Urban Heat Island effect](#).

Answer: Urban Heat Island Effect has been examined [quite thoroughly](#) (PDF) and found to have a negligible effect on temperature trends. [Real Climate](#) has a detailed discussion of this [here](#). What's more, NASA GISS takes explicit steps in their [analysis](#) to remove any such spurious signal by normalizing urban station data trends to the surrounding rural stations. It is a real phenomenon, but it is one climate scientists are well aware of and have taken any required steps to remove its influence from the raw data.

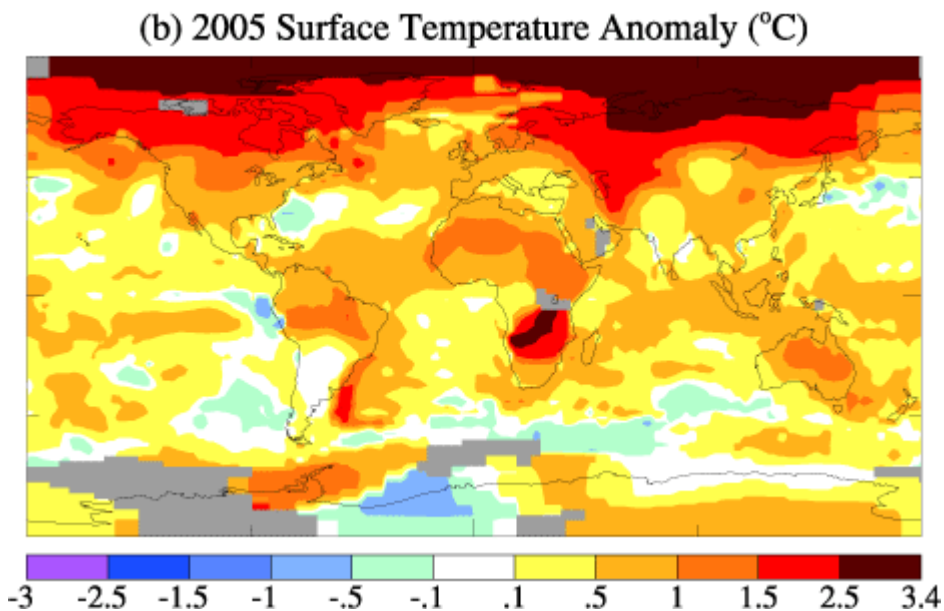
But heavy duty data analysis and statistical processing aside, a little common sense and a couple of pertinent images should put this idea to bed. Here is an image, taken from [Astronomy Picture of the Day](#) (a wonderful site, by the way), of the surface of the earth.

It is a composite of hundreds of satellite images all taken at night. (The [large version](#) is well worth the download time!)



Aside from being very beautiful, it is a perfect indicator of urbanization on earth. As you can see, the greatest urbanization is over the continental United States, Europe, India, Japan, Eastern China, and generally coastal South America.

This next image was taken from [NASA GISS](#). It is a global surface temperature anomaly map which shows warming (and infrequently, cooling) by region.



Look at North America, look at Europe, at Asia, Australia, Africa and the Poles and compare them to the urbanization in the image from [APOD](#). There is quite simply no way to discern any correlation whatsoever between urbanization and warming. If the UHI

effect were the cause of warming in the globally averaged record, we would see it in this map.

The claim that global warming is an artifact of the Urban Heat Island Effect is simply an artifact of the Urban Myth Effect.

## 'It's the sun, stupid'

<http://gristmill.grist.org/story/2006/12/28/090/30666>

Posted by [Coby Beck](#) at 9:23 AM on 29 Dec 2006

Objection: The sun is the source of warmth on earth. Any increase in temperature is likely due to changes in solar radiation.

Answer: It's true that the earth is warmed, for all practical purposes, entirely by solar radiation, so if the temperature is going up or down, the sun is a reasonable place to seek the cause.

Turns out it's more complicated than one might think to detect and measure changes in the amount or type of sunshine reaching the earth. Detectors on the ground are susceptible to all kinds of interference from the atmosphere -- after all, one cloud passing overhead can cause a shiver on an otherwise warm day, but not because the sun itself changed. The best way to detect changes in the output of the sun -- versus changes in the radiation reaching the earth's surface through clouds, smoke, dust, or pollution -- is by taking readings from space.

This is a job for satellites. According to [PMOD at the World Radiation Center](#) there has been no increase in solar irradiance since at least 1978, when satellite observations began. This means that for the last thirty years, while the [temperature has been rising fastest](#), the sun has not changed.

There has been work done reconstructing the solar irradiance record over the last century, before satellites were available. According to the [Max Planck Institute](#), where this work is being done, there has been no increase in solar irradiance since [around 1940](#). This reconstruction does show an increase in the first part of the 20th century, which coincides with the warming from around 1900 until the 1940s. It's not enough to explain all the warming from those years, but it is responsible for a large portion. [See this chart](#) of observed temperature, modeled temperature, and variations in the major forcings that contributed to 20th century climate.

RealClimate has a couple of detailed discussions on what we can conclude about solar forcing and how science reached those conclusions. Read them [here](#) and [here](#).

## 'Current global warming is just part of a natural cycle'

<http://gristmill.grist.org/story/2006/12/17/22147/335>  
Posted by [Coby Beck](#) at 9:19 PM on 18 Dec 2006

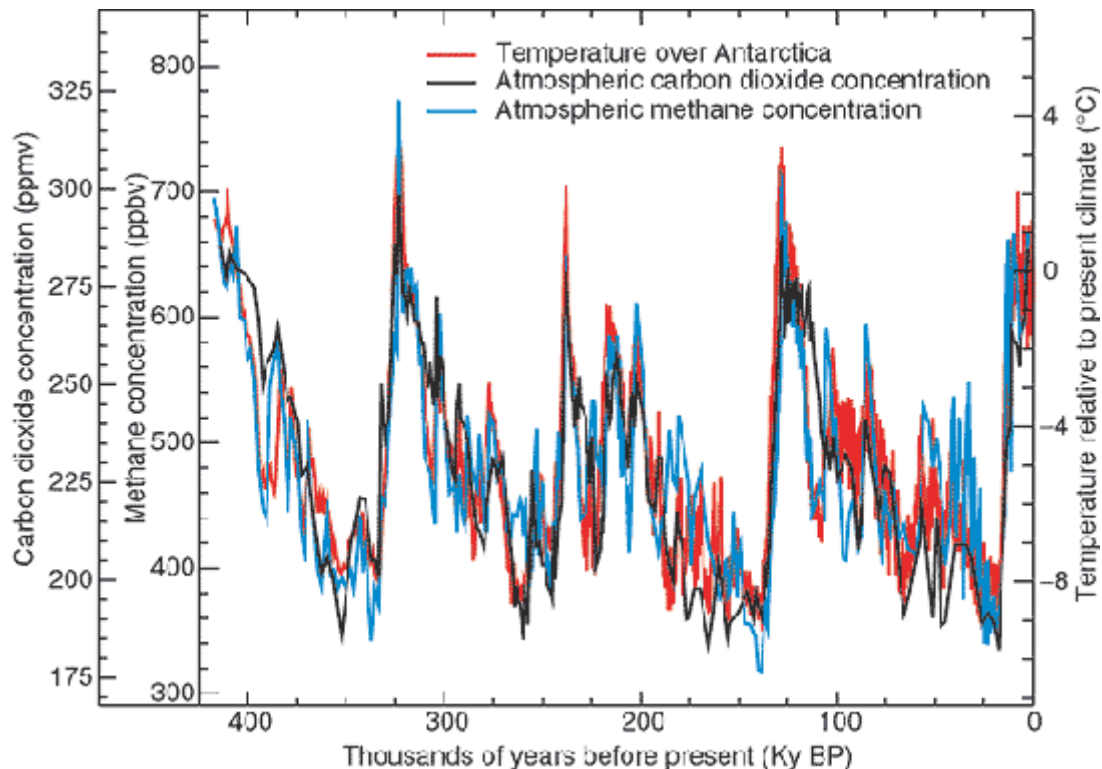
Objection: Current warming is just part of a natural cycle.

Answer: While it is undoubtedly true that there are natural cycles and variations in global climate, those who insist that current warming is purely natural -- or even mostly natural -- have two challenges.

First, they need to identify the mechanism behind this alleged natural cycle. Absent a forcing of some sort, there will be no change in global energy balance. The balance is changing, so natural or otherwise, we need to find this mysterious cause.

Second, they need to come up with an explanation for why a 35% increase in the second most important greenhouse gas does not affect the global temperature. Theory *predicts* temperature will rise given an enhanced greenhouse effect, so how or why is it *not* happening?

The mainstream climate science community has provided a well-developed, internally consistent theory that accounts for the effects we are now observing. It provides explanations and makes [predictions](#). Where is the skeptic community's model or theory whereby CO2 does not affect the temperature? Where is the evidence of some other natural forcing, like the [Milankovich cycles](#) that controlled the ice ages (a fine historical example of a dramatic and regular climate cycle that can be read in the [ice core records](#) taken both in Greenland and in the Antarctic)?



Is this graph a candidate for explaining today's warming? A naive reading of this cycle indicates we should be experiencing a *cooling* trend now -- and indeed we were gradually cooling over the length of the pre-industrial [Holocene](#), around .5C averaged over 8,000 years.

Not only is the direction of the change wrong, but compare the speed of those fluctuations to today's changes. Leaving aside the descents into glaciation, which were much more gradual, the sudden (geologically speaking) jumps up in temperature every ~100,000 years represent a rate of change roughly *ten times slower* what we are currently witnessing.

So could current changes be part of a natural cycle? Well, no natural cause has been identified. There is no climatological theory in which CO2 does not drive temperature. And natural cycle precedents do not exhibit the same extreme changes we're now witnessing.

In short: No.

## 'CO2 doesn't lead, it lags'

Posted by [Coby Beck](#) (Guest Contributor) at 12:07 AM on 27 Dec 2006

Objection: In glacial-interglacial cycles, CO2 concentration lags behind temperature by centuries. Clearly, CO2 does not cause temperatures to rise; temperatures cause CO2 to rise.

Answer: When viewed coarsely, historical CO2 levels and temperature show a [tight correlation](#). However, a closer examination of the CH4, CO2, and temperature fluctuations recorded in the [Antarctic ice core records](#) reveals that, yes, temperature moved first.

Nevertheless, it is misleading to say that temperature rose and then, hundreds of years later, CO2 rose. These warming periods lasted for 5,000 to 10,000 years (the cooling periods lasted more like 100,000 years!), so for the majority of that time (90% and more), temperature and CO2 rose together. This remarkably detailed archive of climatological evidence clearly allows for CO2 acting as a cause for rising temperatures, while also revealing it can be an effect of them.

The current understanding of those cycles is that changes in orbital parameters (the [Milankovich](#) and [other](#) cycles) caused greater amounts of summer sunlight to fall in the northern hemisphere. This is a small forcing, but it caused ice to retreat in the north, which changed the albedo. This change -- reducing the amount of white, reflective ice surface -- led to further warmth, in a feedback effect. Some number of centuries after that process started, CO2 concentrations in the atmosphere began to rise, which amplified the warming trend even further as an additional feedback mechanism.

(You can go [here](#) for a discussion of exactly this question by climate scientists, with greater technical detail and full references to the scientific literature.)

So it is correct that CO<sub>2</sub> did not *trigger* the warmings, but it definitely *contributed* to them -- and according to climate theory and model experiments, greenhouse gas forcing was the dominant factor in the magnitude of the ultimate change.

This raises a warning for the future: we may well see additional natural CO<sub>2</sub> come out of the woodwork as whatever process took place repeatedly over the last 650K years begins to play out again. The likely candidates are out-gassing from warming ocean waters, carbon from warming soils, and methane from [melting permafrost](#).

## Part B: Policy and Action Topics

Notice that this section draws upon scientific facts sometimes, but also draws upon logic, economics, history, opinion and values. It's important to let your audience know if you move from a scientific argument, rooted in the scientific consensus, to the realm of opinion. There is much room for debate on topics of policy and action. It's OK to base an argument about policy or action on your values. Let folks know: "I am doing X because I believe that Y is important."

### 'Climate change mitigation would lead to disaster'

<http://gristmill.grist.org/story/2007/1/24/18548/9954>  
Posted by [Coby Beck](#) at 12:24 PM on 25 Jan 2007

Objection: The kind of drastic actions required to mitigate global warming risk the destruction of the global economy and the deaths of potentially billions of people.

Answer: Is this supposed to mean the theory of anthropogenic global warming must be wrong? You can not come to a rational decision about the reality of a danger by considering how hard it might be to avoid. First things first: understand that the problem is real and present.

Once you acknowledge the necessity of addressing the problem, taking action suddenly become less daunting. There is no point in discussing the best solutions or the cost of those solutions with someone who does not yet acknowledge the problem.

But even if mitigating global warming would be harmful, given that famine, droughts, disease, loss of major coastal cities, and a tremendous mass extinction event are on the table as possible consequences of doing nothing, it may well be we are faced with a choice between the lesser of two evils. I challenge anyone to conclusively demonstrate that such catastrophes as listed above await us if we try to reduce fossil fuel use.

Now, in terms of conservation and a global switch over to alternative fuels, the people who oppose doing this for climate change mitigation are forgetting something rather important. Fossil fuels are a **non-renewable resource**, and as such we have to make this global economic transformation regardless, whether now or a bit later. Many bright minds inside the industry think we are already at peak oil. So even if it turned out that climate mitigation was unnecessary, we would still be in a better place as a global society by making the coming switch sooner rather than later.

Seems like a win-win situation to me.

# 'Why should the U.S. join Kyoto when China and India haven't?'

<http://gristmill.grist.org/story/2007/1/9/172316/4448>

Posted by [Coby Beck](#) at 9:46 AM on 11 Jan 2007

Objection: Why should the U.S. join Kyoto while India and China haven't?

Answer: The U.S. puts out more CO<sub>2</sub> than any other nation on earth, including China and India, by a large margin. Considering the relative populations (a billion-plus each for China and India versus 300 million in the U.S.), per capita emissions in the U.S. are many times larger. This has been true for the past 100-plus years of CO<sub>2</sub> pollution.

For the U.S. to refuse to take any steps until India and China do the same is like the fattest man at the table, upon realizing the food is running out, demanding that the hungry people who just sat down cut back just as much as him, at the same time.

There is no morally sane assessment of the global warming problem that does not place a greater burden on the U.S., the worst polluter. Perhaps we should divide global emissions by global population and allocate carbon credits according to census data. Or, using a Kyoto 1990-levels approach, perhaps we should demand that all nations target the per-capita levels of the U.S. in the 1990s. If you live anywhere but inside U.S. borders, these proposals do not sound preposterous.

All that aside, it is simply untrue that China and India have not joined the Kyoto treaty. They have. They were simply not required to return to the third-world level of emissions they produced in 1990. What comes next for them has yet to be negotiated. Further, this framework of differing responsibilities and the acknowledgement of differing social needs was *explicitly* accepted in the [UNFCCC treaty](#) -- which was ratified by the U.S.

The U.S. has already agreed that China and India should be held to different standards!

Paragraph 3:

Noting that the largest share of historical and current global emissions of greenhouse gases has originated in developed countries, that per capita emissions in developing countries are still relatively low and that the share of global emissions originating in developing countries will grow to meet their social and development needs ...

Paragraph 6:

Acknowledging that the global nature of climate change calls for the widest possible cooperation by all countries and their participation in an effective and appropriate

international response, in accordance with their common but differentiated responsibilities and respective capabilities and their social and economic conditions ...

Clearly, the notion that it's unfair to expect the largest historical polluters to make the greatest reductions is not only *wrong*, but it is a violation of an already signed and ratified treaty on the issue of global warming.

But now that the world's biggest polluter has refused to make any sacrifices, what do you think China will have to say when renegotiations come around in 2012?

## 'What's wrong with warmer weather?'

Posted by [Coby Beck](#) (Guest Contributor) at 2:09 PM on 09 Jan 2007

Objection: The earth has had much warmer climates in the past. What's so special about the current climate? Anyway, it seems like a generally warmer world will be better.

Answer: I don't know if there is a meaningful way to define an "optimum" average temperature for planet earth. Surely it is better now for all of us than it was 20,000 years ago when so much land was trapped beneath ice sheets. Perhaps any point between the recent climate and the extreme one we may be heading for, with tropical forests inside the arctic circle, is as good as any other. Maybe it's even better with no ice caps anywhere.

It doesn't matter. The critical issue is not what the temperature is, or may be, or will be. The critical issue is how fast it is [moving](#).

[Rapid change](#) is the real danger. Human habits and infrastructure are suited to particular weather patterns and sea levels, as are ecosystems and animal behaviors. The rate at which global temperature is rising today is likely unique in the [history of our species](#).

This kind of sudden change is rare even in geological history, though perhaps not unprecedented. So the planet may have been through similar things before -- that sounds reassuring, right?

Not so much. Once you look at the impact similar changes had on biodiversity at the time, the existence of historical precedent becomes anything but [reassuring](#). Rapid climate change is the prime suspect in most mass extinction events, including the [Great Dying](#) some 250 million years ago, in which 90% of all life went extinct.

What we know about ecosystems, and what geologic history demonstrates, is that dramatic climate changes -- up or down or sideways -- are a tremendous shock to the biosphere and cause mass extinction events. That, all in all, is not likely to be a good thing.

From Salon.com, Oct. 5, 2004

## Coal: Clean, green power machine?

Forget about that nasty oil or radioactive nuclear waste: If you want to breathe fresh air, says the coal industry, burn, baby, burn!

The 30-second TV ad opens with a bald eagle struggling to fly through a smoggy sky. The year is 1970, and the location is a mountain in North America. But wherever this range supposedly is, you would have to wear a gas mask to hike it.

After a few seconds of flapping through the soot, the wheezing eagle gives up, crash-landing on a rock. With a deep cough, like a smoker who has been puffing away for decades, the eagle sputters: "Not a good day for flyin'."

Cut to the next scene; the year is 2004, and the bald eagle is floating above the same mountains. But now the sky is bright blue, dotted with puffy white clouds. The eagle soars, true and proud -- God bless America!

Is this a self-satisfied broadside from environmentalists celebrating the Clean Air Act? Not at all. The free-flying eagle is bringing happy tidings from a group called [Americans for Balanced Energy Choices](#), a 5-year-old nonprofit funded by the coal, rail and power industries. ABEC's primary purpose, apparently, is to promote the notion that coal is, as its Web site declares, not only "affordable" but also "increasingly clean."

A voice-over in the rehabilitated-eagle ad intones: "Thanks in part to clean coal technologies, our air quality has been improving. And by 2015 emissions from coal-based power plants will be 75 percent less than they were in 1970."

The claim doesn't sit well with environmentalists. "What emissions are they talking about? Clearly, they're not talking about CO<sub>2</sub> [carbon dioxide] -- there's no question," says Aimee Christensen, executive director of [Environment 2004](#), a political group dedicated to exposing the Bush administration's anti-environmental record. Under Bush, the [Environmental Protection Agency](#) has refused to regulate carbon dioxide as a pollutant, even though emissions of CO<sub>2</sub> have been closely linked by scientists to global warming, and coal-fired power plants are significant producers of CO<sub>2</sub>.

No Americans for Balanced Energy Choices would return calls for this article, but the eagle spot, which has been broadcast on CNN, can be seen on the Web [here](#). It's the latest salvo in the [industry group's](#) ongoing [campaign](#) to promote "clean coal" as a cheap and increasingly green electricity source for the future.

Environmental and corporate watchdog groups have taken pains to debunk the nonprofit front group's trumped-up "Don't worry, love coal" claims, but in an election year where coal-loving swing states such as West Virginia and Pennsylvania are very much in play,

both presidential candidates have embraced the "clean coal" mantra. That's easy enough for them to do even if their positions on global warming differ, because "clean coal" is one of those catchphrases that mean less the closer you look at them. Ultimately, "clean coal" is an umbrella term for many technologies, everything from widely available [scrubbers](#) that reduce sulfur dioxide, which causes acid rain, to cutting-edge [carbon-sequestration](#) technologies that hold out the hope of capturing greenhouse gases and storing them under the earth in vast geologic reserves.

With access to energy resources now [synonymous](#) with national security, it's not hard to see why King Coal has taken its new spin. "When oil prices started spiking, they started calling themselves domestic, secure energy. They're making people think about coal as a safer alternative to oil and natural gas," says Kert Davies, research director for [Greenpeace](#).

With oil at \$50 a barrel, and [natural gas](#) prices on the rise, look for more feel-good coal messages. But no matter how high that eagle flies, don't expect it to escape the consequences of global warming anytime soon, no matter how squeaky clean the coal industry claims to be.

From [gristmill.grist.org](http://gristmill.grist.org):

## **Peak oil: Not an environmental silver bullet**

**Posted by [David Roberts](#) at 12:51 PM on 28 Nov 2005**

Something's been bugging me about peak oil, and today we got a letter to the editor that crystallized it. I put it below the fold -- give it a read.

It's this: Environmentalists seem to have a somewhat naive faith that once the concept of peak oil sinks in, people will move -- as though by the force of tides -- to support renewable, decentralized energy.

But why should that be true? A much more natural, predictable reaction would be to push like mad for more drilling and for more coal gasification. Both more drilling and more coal-to-liquid-fuel production would fit better with our existing infrastructure and practices, however environmentally malign they may be.

The economics of peak oil will scare and motivate people, but there's no particular reason the *environmental* aspects of it will grip them. You know?

Anyway, read the letter.

Re: [Take a Peak](#), Main Dish, by Amanda Griscom Little, Nov 3 2005

If only Matthew Simmons were right, environmentalists would have a stable platform for crusading for fuel conservation, huge investment in oil alternatives, and a major

restructuring of our economy and society. Unfortunately, the peak oil hypothesis is desperately naive about oil alternatives and infrastructure.

The technology already exists for turning coal into oil or natural gas on a scale that will be more than adequate to offset the decline of conventional oil and gas supplies. Even without considering numerous renewable alternatives, the vast coal reserves would allow the fossil fuel economy to keep humming (or Hummering) with only a few years of marginally higher oil prices. Instead of worrying about rising oil prices, we should strategize about directing energy investor *responses* to high conventional oil prices.

Some will push to drill for oil everywhere. Others will seek investment in infrastructure to convert coal. Both parties will have the upper hand because their solutions are most compatible with our existing infrastructure. Interest in these activities is already evident in rapidly escalating exploratory drilling rates, massive investments in oil and tar-sand developments, and near record share prices for fossil energy companies.

This rush to fill the shortfall will lead to over-capacity. There will be a glut in the liquid fuels market, and the price of oil will not rise beyond \$100 per barrel, but will fall towards the marginal cost of production from tar sands and coal -- \$20-40 per barrel. Since tar sands and coal are far dirtier and more carbon-intensive than conventional oil, and low fuel prices will encourage consumption, this scenario would entail disastrous environmental and health impacts.

"Peak oil" represents not a crisis but a cross-roads. One path leads to energy production methods that are more environmentally destructive, but easier because of our existing infrastructure. The other realizes the promise of renewable alternatives and smart growth. When focused, environmental advocacy has been successful in helping society choose the right path. To do so here, we must recognize that "peak oil" brings both threats and opportunities, and will not alone define the right path. We're still living with a six-century fossil fuels legacy prompted by "peak wood" in the UK; it is time to make sure the path chosen now is more sustainable, socially and environmentally.

Kai M. A. Chan and Hadi Dowlatabadi  
[Institute for Resources, Environment & Sustainability](#)

## **How to explain peak oil to everybody (even Paris Hilton): Target your peak oil message to your audience**

**Posted by [Sharon Astyk](#) (Guest Contributor) at 2:23 PM on 22 May 2008, [gristmill.grist.org](#)**

Peak oil is all over the place. The cover of the *Wall Street Journal*, CNN, you name it. The peak has tipped into the consciousness of the world. And those of us who were aware before are going to be fielding some questions. So it pays to have a response ready for the latecomers.

It has occurred to me that there must be a simple way of explaining peak oil to everyone - but most solutions have concentrated on creating a *single* simple method of explaining peak oil, when what is needed is a highly specialized approach, designed to help people grasp the issue in the most basic terms imaginable. Being a helpful sort, I have undertaken to provide those explanations. Thus, all you need to do is evaluate the person you are explaining things too, and from there, insert the proper explanation, using my handy list.

**If the person is a lot like Homer Simpson:**

The way to explain it is: "Beer comes from oil. You use oil to run tractor to grow barley. You use oil to run fermenting equipment. You use oil to ship beer to liquor store. You use gas, made from oil, to drive drunk to the store to get beer. No oil means no more beer -- *ever*."

The solution you offer: More beer good. Beer comes from oil. Must. Save. Beer.

**If the person is a lot like A Soccer Mom:**

The way to explain it: "Yes, I heard how awful it was that the coach criticized your Christina -- I agree, he was completely out of line to hurt her self esteem like that. Speaking of self-esteem, did you know I've lost 11 lbs on the 100-mile diet? I feel great, and I fit into some clothes I haven't worn since Jared was born. All that fresh produce and unprocessed food has been so wonderful -- Mike says I look younger, too, and it seems to improve my skin. And Jennifer is a lot less hyperactive since we've been biking everywhere. And Lisa is writing her college application essay on the impact of our environmental lifestyle changes. My friend Rita who is a guidance counselor told me that this will really help differentiate her from all the soccer players and school newspaper writers for the people at Yale. Green is the new black, you know."

The solution you offer: You will be thinner, happier, sexier, and your kids will be smarter if you do this stuff. Oh, and btw, it saves energy, too.

**If the person is a lot like Rush Limbaugh:**

The way to explain it: "Evil people in China and India are burning up all of America's oil. Those selfish bastards are trying to compete with us just so that they can have running water, and the Democrats in Congress won't let us nuke them like we really should. They are trying to prove that Americans can't compete without a lot of energy. We need to prove that we're better than they are, with or without oil, because God loves America best. With Jesus to help us conserve, we don't have to have oil."

The solution you offer: Conservation is patriotic, and a good way to stick it to people in other countries.

**If the person is a lot like Paris Hilton:**

The way to explain it: "Without oil to manufacture TV sets, run Entertainment Tonight and power all that TV, no one will watch what you do. No one will care if you have sex on the internet, go to jail, or kill Britney Spears with your bare hands while mud wrestling on reality TV. Yes, you'll probably still be rich enough to buy oil, but all the good hotels will be having brownouts, and everyone will be so busy trying to get along that they won't care about you. Oh, and if they get a chance, your servants will probably kill and eat your little rat-dog."

The solution you offer: "Think how much attention Angelina Jolie got by adopting all those poor kids. Maybe you should take some of your money and bring renewable power to a whole city in India. You could have a series on almost any network but Fox about making your home environmentally sound and helping poor people get access to renewable energy."

**If the person is a lot like Grandpa Simpson:**

The way to explain it: "You know, back in the old days we didn't have all this newfangled technology crap. We just did good, hard work, and knew the value of a dollar. Back then we didn't need TV or cell phones or cars. We didn't sit around downloading music from that there internet; we had real music, in real speakeasies, and we danced for hours. And that pornography on that there filthy computer -- in our day, we had to do real work to see naked women, carve real peep holes through rock-hard chestnut boards. Kids these days wouldn't know what to do with a hoe or a horse or a jackknife if it bit them in the ass. We need legislation to get them off the streets and back onto the farms!"

What to suggest: national service programs, chain gangs and Victory Gardens.

**If the person is an Aging Hippie:**

What to say: "You were right about everything. Absolutely everything. Growing your own food. Renewable energy. The economy. Drugs. How sexy greying ponytails are. Not trusting old people ... oh wait ..." Well, almost everything.

What to suggest: Stop looking so smug.

**If the person is an Economist:**

The way to explain it: "OK, just for a moment, let me ask you to suspend your belief for just a moment. Imagine that unicorns and fairies roam the forests, that the sun goes around the earth and that the U.S. has a meaningful third party. OK, now imagine that it is just possible that we can't actually substitute grain for gasoline, or benzene for water. And further imagine that people dying is bad, even if it seems like it is good for the economy."

What to suggest: Give up now.

### **If the Person is Your Dubious Spouse:**

The way to explain it: "I'm doing this because I love you and I want us to have a positive future. Preparing for a low energy future will definitely bring us closer together and make our marriage stronger, happier, and sexier. I can't think of anything more romantic than discussing our feelings, the current depletion rate, and the latest apocalyptic novel while canning okra in the 90-degree heat. And I think you are never more beautiful than when you are putting up rainwater cachment."

What to suggest: A literal roll in the hay. Move the scythe first.

### **If the person is The President of the United States:**

What to say: Ask Dick. He'll explain it to you.

What to suggest: Invade Venezuela, Iran, Russia, Mexico, and Norway by Thursday

<http://gristmill.grist.org/skeptics>

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## **How to Talk to a Climate Skeptic**

Below is a complete listing of the articles in "How to Talk to a Climate Skeptic," a series by Coby Beck containing responses to the most common skeptical arguments on global warming. They are grouped by "stages of denial".

1. **There's nothing happening**
  - a. Inadequate evidence
    - [There is no evidence](#)
    - [One record year is not global warming](#)
    - [The temperature record is simply unreliable](#)
    - [One hundred years is not enough](#)
    - [Glaciers have always grown and receded](#)
    - [Warming is due to the Urban Heat Island effect](#)
    - [Mauna Loa is a volcano](#)
    - [The scientists aren't even sure](#)
  - b. Contradictory evidence
    - [It's cold today in Wagga Wagga](#)
    - [Antarctic ice is growing](#)
    - [The satellites show cooling](#)
    - [What about mid-century cooling?](#)
    - [Global warming stopped in 1998](#)
    - [But the glaciers are not melting](#)
    - [Antarctic sea ice is increasing](#)
    - [Observations show climate sensitivity is not very high](#)
    - [Sea level in the Arctic is falling](#)
    - [Some sites show cooling](#)
  - c. No consensus
    - [Global warming is a hoax](#)

- [There is no consensus](#)
    - [Position statements hide debate](#)
    - [Consensus is collusion](#)
    - [Peiser refuted Oreskes](#)
- 2. **We don't know why it's happening**
  - a. Models don't work
    - [We cannot trust unproven computer models](#)
    - [The models don't have clouds](#)
    - [If aerosols are blocking the sun, the south should warm faster](#)
    - [Observations show climate sensitivity is not very high](#)
  - b. Prediction is impossible
    - [We can't even predict the weather next week](#)
    - [Chaotic systems are not predictable](#)
  - c. We can't be sure
    - [Hansen has been wrong before](#)
    - [If we can't understand the past, how can we understand the present?](#)
    - [The scientists aren't even sure](#)
    - [They predicted global cooling in the 1970s](#)
- 3. **Climate change is natural**
  - a. It happened before
    - [It was warmer during the Holocene Climatic Optimum](#)
    - [The medieval warm period was just as warm as today](#)
    - [Greenland used to be green](#)
    - [Global warming is nothing new!](#)
    - [The hockey stick is broken](#)
    - [Vineland was full of grapes](#)
  - b. It's part of a natural change
    - [Current global warming is just part of a natural cycle](#)
    - [Mars and Pluto are warming too](#)
    - [CO2 in the air comes mostly from volcanoes](#)
    - [The null hypothesis says global warming is natural](#)
    - [Climate is always changing](#)
    - [Natural emissions dwarf human emissions](#)
    - [The CO2 rise is natural](#)
    - [We are just recovering from the LIA](#)
  - c. It's not caused by CO2
    - [Climate scientists dodge the subject of water vapor](#)
    - [Water vapor accounts for almost all of the greenhouse effect](#)
    - [There is no proof that CO2 is causing global warming](#)
    - [Mars and Pluto are warming too](#)
    - [CO2 doesn't lead, it lags](#)
    - [What about mid-century cooling?](#)
    - [Geological history does not support CO2's importance](#)
    - [Historically, CO2 never caused temperature change](#)
    - [It's the sun, stupid](#)
- 4. **Climate change is not bad**
  - a. The effects are good
    - [What's wrong with warmer weather?](#)
  - b. The effects are minor
  - c. Change is normal
- 5. **Climate change can't be stopped**
  - a. Too late
    - [Kyoto is a big effort for almost nothing](#)
  - b. It's someone else's problem
    - [Why should the U.S. join Kyoto when China and India haven't?](#)
    - [The U.S. is a net CO2 sink](#)
  - c. Economically infeasible
    - [Climate change mitigation would lead to disaster](#)