GLOBAL WARMING VERSUS GLOBAL GREENING

[This is Matt Ridley's full lecture delivered Monday, 10/16, at the Royal Society of London, the oldest – founded in 1660 – and one of the most prestigious institutions of science in the world. Ridley's lecture will likely be considered the currently definitive refutation of the fraudulent doomsday science of Man Made Global Warming. –JW]

I am a passionate champion of science.

I have devoted most of my career to celebrating and chronicling scientific discovery. I think the scientific method is humankind's greatest achievement, and that there is no higher calling.

So what I am about to say this evening about the state of climate science is not in any sense anti-science. It is *anti-the distortion and betrayal of science*.

I am still in love with science as a philosophy; I greatly admire and like the vast majority of scientists I meet; but I am increasingly disaffected from science as an institution.

The way it handles climate change is a big part of the reason.

After covering global warming debates as a journalist on and off for almost 30 years, with initial credulity, then growing skepticism, *I have come to the conclusion that the risk of dangerous global warming, now and in the future, has been greatly exaggerated while the policies enacted to mitigate the risk have done more harm than good, both economically and environmentally, and will continue to do so.*

And I am treated as some kind of pariah for coming to this conclusion.

Why do I think the risk from global warming is being exaggerated? For four principal reasons.

1. All environmental predictions of doom always are exaggerated;
2. The models have been consistently wrong for more than 30 years;
3. The best evidence indicates that climate sensitivity is relatively low;
4. The climate science establishment has a vested interest in alarm.

Global greening

I will come to those four points in a moment. But first I want to talk about *global greening*, the gradual, but large, increase in green vegetation on the planet.

I think this is one of the most momentous discoveries of recent years and one that transforms the

scientific background to climate policy, though you would never know it from the way it has been reported. And it is a story in which I have been both vilified and vindicated.

In December 2012, the environmental scientist Jesse Ausubel of Rockefeller University Dr.ew my attention to a video online of a lecture given by Ranga Myneni of Boston University. It was entitled A Greener Earth?

In this lecture Myneni presented ingenious analysis of data from satellites proving that much of the vegetated area of the planet was getting greener, only a little bit was getting browner, and that overall in 30 years there had been a roughly 14% increase in green vegetation on planet Earth.

In this slide he argued that this was occurring in all vegetation types – tropical rain forests, subarctic taiga, grasslands, semi-deserts, farmland, everywhere.

What is more, Myneni argued that by various means he could calculate that about *half of this greening was a direct result of rising carbon dioxide levels in the atmosphere*, rather than the application of agricultural fertilizer, irrigation, warmer temperatures or increased rainfall.

Carbon dioxide, along with water, is the raw material that plants use to make carbohyDr.ates, with the help of sunlight, so it stands to reason that raising its concentration should help plants grow.

I was startled by Myneni's data. I knew that there had been thousands of so-called free-air concentration (FACE) experiments, in which levels of CO2 had been increased over crops or wild ecosystems to find out if it boosted their growth (it did), and that commercial greenhouse owners now routinely maintain CO2 levels in their greenhouses at more than double ambient levels – because it makes their tomatoes grow faster.

But the global effect of CO2 levels on the quantity of vegetation had not, as far as I could tell, been measured till now.

Other lines of evidence also pointed to this global greening:

* the increased rate of growth of forest trees,

* the increased amplitude of seasonal carbon dioxide variation measured in Hawaii and elsewhere,

* photographic surveys of vegetation,

* the increased growth rate of phytoplankton, marine plants and some corals, and so on.

I published an article in the Wall Street Journal in January 2013 on these various lines of evidence, including Myneni's satellite analysis, pointing to the increase in green vegetation.

This was probably the very first article in the mainstream media on the satellite evidence for global greening.

For this I was subjected online to withering scorn by the usual climate spin doctors, but even they had to admit I was “factually accurate”.

Six months later Randall Donohue and colleagues in Australia published a paper using satellite data to conclude that the arid parts of the planet, such as western Australia and the Sahel region, had seen a net greening of 11% over 30 years – similar results to Myneni’s.

Myneni’s results, however, remained unpublished. I was puzzled by this. Then I realized that one of the IPCC’s periodic assessment reports was in preparation, and that probably Dr.. Myneni and colleagues might delay the publication of their results until after that report was published, lest “the skeptics have a field day” with it.

That last phrase, by the way, is from one of the Climategate emails, the one on 22 September 1999 in which Dr. Michael Mann approves the deletion of inconvenient data.

Sure enough, Myneni’s results were eventually published three years later in April 2016 in a paper in Nature Climate Change, with 32 authors from 24 institutions in eight countries – when the IPCC report was safely in the public domain and the great Paris climate jamboree was over.

His results in 2016 were now even stronger than he had concluded in his 2012 lecture. Now he

said that *70% of the cause of greening was carbon dioxide – up from half.*

As Myneni's co-author Zaichun Zhu, of Beijing University, puts it, it's equivalent to adding a green continent twice the size of mainland USA.

Frankly, I think this is big news. A new continent's worth of green vegetation in a single human generation.

At the end of 2015, when his paper had been under peer review for eight months so he knew these results were coming, Dr. Myneni, criticized me specifically, saying on a green blog that "[Ridley] falsely claims that CO2 fertilization is responsible for the greening of the earth".

Yet a few months later he himself published evidence that "CO2 fertilization explains 70% of the greening trend".

In the press release accompanying the article in April 2016 he once again referred to me by name: "The beneficial aspect of CO2 fertilization in promoting plant growth has been used by contrarians, notably Lord Ridley…to argue against cuts in carbon emissions to mitigate climate change…"

As Richard Tol commented: "The new paper vindicates what Matt Ridley and others have been saying all along — yet they apparently deserve to be kicked nonetheless."

I wrote to Dr. Myneni politely asking him to justify his criticism of me with specific examples. He was unable to do so. "There are no 'up-sides' to having too much CO2 in the air," was all he said.

In the very same issue of the same journal was another paper from an international team about a further benefit of global greening, which concluded that CO2 fertilization is likely to increase crop water productivity throughout the world, for example by up to 48% for rain-fed wheat in arid areas, and that "If realized in the fields, the effects of elevated [CO2] could considerably mitigate global yield losses whilst reducing agricultural consumptive water use (4–17%)."

Their chart shows that without CO2 fertilization, crops will become more water-stressed during the current century, with it they will become LESS water-stressed.

These are huge benefits for the earth and for people. *The CO2 fertilization effect is already worth trillions of dollars*, according to detailed calculations by Craig Idso.

At this point Steve McIntyre of Climate Audit drew attention to my vindication on twitter. Richard Betts, the Met Office's twitter frequenter, protested that global greening was well known and had been referred to in the IPCC's report.

This was misleading at best and false at worst. The Summary for Policy Makers of Working Group 2 refers to global greening not at all.

The full report of WG2, produced six months after the Summary for Policy Makers in that reprehensible fashion so beloved of the IPCC, does very gently hint at there being some evidence of greening, but in a dismissive way, and far too late to catch the attention of journalists. These are the only mentions I could find:

If that's a clear and prominent statement that carbon dioxide emissions have increased green vegetation on the planet by 14% and are significantly reducing the water requirements of agriculture, then I'm the Queen of Sheba.

Back in 1908 Svante Arrhenius, the father of the greenhouse theory, said the following:

"By the influence of the increasing percentage of carbonic acid in the atmosphere, we may hope to enjoy ages with more equable and better climates."

It appears he was not wrong.

The Consensus

Now let me back to global warming.

Gro Harlem Brundtland, former Prime Minister of Norway and UN Special representative on Climate Change, said in a speech in 2007 that "it is irresponsible, reckless and deeply immoral to question the seriousness of the situation. The time for diagnosis is over. Now it is time to act".

I disagree. It is irresponsible not to challenge the evidence properly, especially if the policies pursued in its name are causing suffering.

Increasingly, many people would like to outlaw, suppress, prosecute and censor all discussion of what they call "the science" rather than engage in debate.

"We will not, at any time, debate the science of climate change," said three professors at the University of Colorado in an email to their students recently.

Shamefully, much of the scientific establishment and the media are prepared to go along with that program. And to bully any academic or journalist who steps out of line.

This coercion was displayed all too vividly when the distinguished scientist Lennart Bengtsson was bullied into resigning from the academic advisory council of the Global Warming Policy Foundation in 2014 by colleagues' threats. He even began to "worry about my health and safety…"

And when Philippe Verdier was sacked as weather forecaster in France for writing an honest book. And when Roger Pielke was dropped by the 538 website for telling the truth about storms.

No wonder that I talk frequently to scientists who are skeptical, but dare not say so openly. That is a ridiculous state of affairs.

We're told that it's impertinent to question "the science" and that we must think as we are told.

But arguments from authority are the refuge of priests.

Thomas Henry Huxley put it this way: “The improver of natural knowledge absolutely refuses to acknowledge authority, as such. For him, skepticism is the highest of duties; blind faith the one unpardonable sin.”

What keeps science honest, what stops it from succumbing entirely to confirmation bias, is that it is decentralized, allowing one lab to challenge another.

That’s how truth is arrived at in science, not by scientists challenging their own theories (that’s a myth), but by scientists disputing each other’s theories.

These days there is a legion of well paid climate spin doctors. Their job is to keep the debate binary: either you believe climate change is real and dangerous or you’re a denier who thinks it’s a hoax.

But there’s a third possibility they refuse to acknowledge: that it’s real but not dangerous. That’s what I mean by lukewarming, and I think it is by far the most likely prognosis.

I am not claiming that carbon dioxide is not a greenhouse gas; it is.

I am not saying that its concentration in the atmosphere is not increasing; it is.

I am not saying the main cause of that increase is not the burning of fossil fuels; it is.

I am not saying the climate does not change; it does.

I am not saying that the atmosphere is not warmer today than it was 50 or 100 years ago; it is.

And I am not saying that carbon dioxide emissions are not likely to have caused some (probably more than half) of the warming since 1950.

I agree with the consensus on all these points.

I am not in any sense a “denier”, that unpleasant, modern term of abuse for blasphemers against the climate dogma, though the Guardian and New Scientist never let the facts get in the way of their prejudices on such matters. I am a lukewarmer.

Should UK's Royal Society host those who deny climate science?

The scientific society risks undermining some of its good work by hiring out its prestigious platform to people who should be ignored, says **Michael Le Page**

Incidentally, some of my scientific friends accuse me of inconsistently agreeing with the scientific consensus that genetic modification of crops is safe and beneficial, but refusing to agree with the scientific consensus that climate change is dangerous. Other people – Prince Charles, for example — do the exact opposite.

Well, my friends are wrong. I agree with the scientific consensus on GM crops not because it is a consensus but because I've looked at sufficient evidence.

And in any case, as I say, I am not disagreeing with the consensus on climate change.

There is no consensus that climate change is going to be dangerous. Even the IPCC says there is a range of possible outcomes, from harmless to catastrophic. I'm in that range: I think the top of that range is very unlikely. But the IPCC also thinks the top of its range is very unlikely.

The supposed 97% consensus, based on a hilariously bogus study by John Cook, refers only to the proposition that climate change is real and partly man-made. Nobody has ever shown anything like a consensus among scientists for the proposition that climate change is going to be dangerous.

Professor Daniel Sarewitz put it well recently:

> "Even the vaunted scientific consensus around climate change…applies only to a narrow claim about the discernible human impact on global warming. The minute you get into questions about the rate and severity of future impacts, or the costs of and best pathways for addressing them, no semblance of consensus among experts remains."

Besides, *consensus is a reasonable guide to data about the past but is no guide to the future and never has been. In non-linear systems with feedbacks, like economies or atmospheres, experts are notoriously bad at forecasting events. There is no such thing as an expert on the future*.

So, as my good friend Christopher Hitchens once said: "Don't take refuge in the false security of consensus."

And remember, as Richard Feynman said, “science is the belief in the ignorance of experts”.

The track record on doom

I said that one reason to be skeptical about dangerous climate change is that environmental predictions of doom are always wrong.

Here’s a list of predictions made with much fanfare and extensive coverage in the media in the 1970s, when I was young and green, in both senses of the word:

- the population explosion would be unstoppable;
- global famine would be inevitable;
- crop yields would fall;
- a cancer epidemic caused by pesticides would shorten lifespan;
- the desert would advance at two miles a year;
- rainforests would disappear;
- acid rain would destroy forests;
- oil spills would worsen;
- oil and gas would run out;
- and so would copper, zinc, chrome and many other natural resources;
- the Great Lakes would die;
- dozens of bird and mammal species would become extinct each year;
- and a new ice age would begin;

All these were trumpeted loudly in the mainstream media. Not one of them has come even close to meeting the apocalyptic expectations of their promoters. Sometimes this was because we took action to avert the danger. Sometimes it is because the jury is still out. More often it was because the scare was exaggerated in the first place.

These were later joined by more predictions of doom:

- sperm counts would fall;
- mad cow disease would kill hunDr.eds of thousands of people;
- genetically modified weeds would devastate ecosystems;
- nanotechnology would run riot;
- computers would crash at the dawn of the millennium, bringing down civilization;
- the hole in the ozone layer would cause blindness and cancer on a huge scale;

Many predictions of climate doom have already been proved wrong, and many of the impacts of global warming have not happened as predicted either:

- malaria was going to get worse because of rising temperatures; it didn’t.

- snow would become a thing of the past; yet northern hemisphere snow cover shows no trend

- hurricanes/cyclones would get worse; they haven’t.

- Droughts would get worse; they haven’t

- the Arctic sea ice would be gone by 2013; it wasn’t.

- glacier retreat would accelerate; yet more than half the retreat of glaciers happened before 1950.

sea level rise would accelerate; it hasn’t

- All these predictions have also failed so far.The death toll from droughts, floods and storms has been going down dramatically. Not because weather has got safer, but because of technology and prosperity.

James Hansen in 1988 said that by the year 2000, “the West Side Highway will be under water. And there will be tape across the windows across the street because of high winds. And the same birds won’t be there.”The UNEP predicted in 2005 that by 2010 there would be 50 million climate refugees. In 2010 it tried to delete the web link.Ten years ago, Al Gore said that within ten years we would have reached the point of no return. We haven’t.

So we should take predictions of doom with a pinch of salt.

The models

The climate models have failed to get global warming right. As the IPCC has confirmed, for the period since 1998, “*111 of the 114 available climate-model simulations show a surface warming trend larger than the observations*”. [IPCC Synthesis report 2014, p 43]

That is to say there is a consensus that the models are exaggerating the rate of global warming.

The warming has so far resulted in no significant or consistent change in the frequency or intensity of storms, tornadoes, floods, droughts or winter snow cover.

As two climate scientists, Richard McNider and John Christy, have put it,

“We might forgive these modelers if their forecasts had not been so consistently and spectacularly wrong. From the beginning of climate modeling in the 1980s, these forecasts have, on average, always overstated the degree to which the Earth is warming compared with what we see in the real climate.”

In 1990, the first IPCC assessment included this statement, forecasting a temperature increase of 0.3 Cº per decade (with an uncertainty range of 0.2 Cº to 0.5 Cº).

In fact in the two and half decades since, even though emissions have risen faster than in the business-as-usual scenario, the temperature has risen at an average rate of about 0.15 C per decade based on surface measurements, or 0.12C per decade based on satellite data; that is, less than half as fast as expected and below the bottom of the uncertainty range!

What about 2015 and 2016 both being record hot years? Well, because of the massive El Nino, the HADCRUT4 surface temperature line just about inched up briefly in early 2016 into respectable territory in among the lower half of the model runs for a few months before dropping back out again. That's all.

Notice also that the warming has been twice as fast in the Northern hemisphere as the southern, that it has been concentrated in colder areas, colder seasons and at night. The difference between the red and blue lines on this chart is 20 years of global warming.

Notice too that the warming has definitely not taken us into uncharted territory. We are in the cooling part of the current interglacial, as shown by Greenland’s ice cores, and tree lines in the Urals are still lower than they were in the middle ages.
By the way, I trust the satellites more than the surface temperature data sets.

The latter are hopelessly contaminated by failures to correct properly for urbanization around measuring stations and a habit among those who control these data sets of “adjusting” old temperatures downwards without giving good reason.

The global temperature in 1910 has been mysteriously falling over the last eight years. The global temperature in 2000 has been mysteriously rising.

But – and here is the amazing thing – even if you take the surface data sets, the rate of global warming is far slower than predicted by the models.

The Intergovernmental Panel on Climate Change says it is 95% sure that more than half of the warming since 1950 is man made. If you use the surface temperature sets that still implies less than half a degree of man-made warming in more than half a century.

This is still nothing like a dangerous change. At this rate dangerous warming is at least a century away. And the slower it happens the less dangerous it is, and the easier to adapt to.

Sensitivity

So why is the atmosphere not doing what it is told?

Actually it is. These results are precisely in line with the physics of the greenhouse effect.

We think recent warming was mainly caused by a change in the composition of the atmosphere, an increase from 0.03% to 0.04% carbon dioxide.

We know that the next 0.01% increment, expected soon after mid century, will have a lesser effect than the last 0.01% – that's basic physics, the diminishing returns or logarithmic nature of the curve, as shown by Guy Callender in 1938.

A doubling of CO2 in the atmosphere cannot on its own produce dangerous warming.

The sensitivity of the atmosphere to CO2 is about 1.2C per doubling. That is the consensus, spelled out clearly (if obscurely) by the IPCC several times over the years. And that's what we are on course for at the moment.

So what is the problem? Well, the theory of dangerous climate change depends on a whole extra step in the argument, one that very few politicians and journalists seem even to know about – the supposed threefold amplification of carbon dioxide's warming potential, principally by extra water vapor released into the atmosphere by a warming ocean, and accumulating at high altitudes.

This is Warren Meyer's diagram to show the difference.

This is where the evidence is much more shaky. Some studies find an increase in water vapor high in the atmosphere, others do not. One complication is that water vapor condenses into clouds and we cannot either measure or model clouds anything like adequately yet.

We know that clouds keep the surface warm at night, while low clouds in particular cool it during the day by reflecting sunlight back into space. The models generally claim that there is a positive correlation between the net cloud radiative effect and temperature, boosting the water vapor amplification.

Yet NASA's CERES data show that there is a strong and significant, negative correlation: that higher temperatures lead to more cloud cooling.

That's a glaring discrepancy between models and data.

Consistent with these discrepancies, recent attempts to measure the sensitivity of the climate system to carbon dioxide using real data nearly all find that it is much lower than the models assume, as Nic Lewis, Marcel Crok, Judith Curry and Pat Michaels have shown in recent years.

Of particular note, the cooling effect of sulphate aerosols is smaller than thought, so cannot be an excuse for the slowness of recent warming.

So, if it’s consensus that floats your boat, there is an emerging consensus from observational estimates that climate sensitivity is low.

The models are assuming too rich a feedback.

What's more, all the high estimates of warming are based on an economic and demographic scenario called RCP 8.5, which is a very, very unrealistic one. [RCP stands for Representative Concentration Pathways; the UN's RCP 8.5 has been called "The Mother of All Junk Climate Science". –JW]

It assumes that population growth stops decelerating and speeds up again.

It assumes that trade and innovation largely cease.

It assumes that the ability of the oceans to absorb CO2 fails.

It assumes that despite all this the income of the average person trebles.

And most absurd of all, it assumes that we go back to using coal for almost everything, including to make motor fuel, so that by 2100 we are using ten times as much coal as we are today.

In short, it is a barking mad scenario, yet whenever you hear a scientist or a politician say something like we are committed to warming of "up to" four degrees, that – and implausibly high sensitivity – is what they are assuming, often without knowing it.

Vested interests

Let me turn to the topic of fossil fuels.

To paraphrase Monty Python, What have fossil fuels done for us?

Apart from a new continent's worth of green vegetation.

And removing the need to cook over a wood fire, the smoke from which is one of the biggest killers in the world, dispatching over three million people a year according to the World Health Organisation.

And removing the need to fetch wood from the forest and dismantle an ecosystem in doing so.

Apart from that what have fossil fuels done for us?

Well, I suppose they supply the power to pump water so that it does not have to be fetched.

They allow electric light and hence help literacy and education.

They bring the refrigeration of food and vaccines.

They enable the child to catch a lift to school.

They make the fertilizer that raises farm yields, ending most hunger and sparing land for wildlife.

Yes, but apart from ending starvation, enabling kids to get to school, refrigerating vaccines, boosting literacy, pumping water, reducing the pressure on forests, reducing indoor air pollution, and creating 14% more green vegetation – apart from all this, what have fossil fuels done for us?

"Fossil fuels don't take a safe climate and make it dangerous, they take a dangerous climate and make it safe," says Alex Epstein.

From time to time, I stand accused of letting the fact that I have a commercial interest in coal, which I have declared many times and hereby do again, influence my assessment of climate science.

But if my critics argue that way about me, then I can argue that way about them. Perhaps Al Gore's commercial interest in renewable energy influences his assessment of climate science. Perhaps Michael Mann's grants and James Hansen's prizes for studying man-made climate change influence his conclusions. I don't think they should be censored, so why should I be?

If climate change is not dangerous then there's no justification for renewable energy subsidies.

> It is beyond question that global warming has generated enormous research funds, measured in many billions, that this has stimulated all sorts of scientists, from botany to psychiatry, to link their work to climate change, and that almost none of this money flows to those with skeptical views.
>
> As the distinguished NASA climate scientist Roy Spencer has written,
> "If you fund scientists to find evidence of something, they will be happy to find it for you. For over 20 years we have been funding them to find evidence of the human influence on climate. And they dutifully found it everywhere, hiding under every rock, glacier, ocean, and in every cloud, hurricane, tornado, raindrop, and snowflake. So, just tell scientists 20% of their funds will be targeted for studying natural sources of climate change. They will find those, too."

Opportunity cost

Suppose I am right and our grandchildren find that we were greatly exaggerating the risks, and underestimating the benefits of CO2.

Suppose they do indeed experience carbon dioxide levels of 600 parts per million or more, but do not experience dangerous global warming, or more extreme weather, just a mild and decelerating increase in global average temperatures, especially at high latitudes, at night and in winter, accompanied by spectacular global greening and less water stress for both people and crops.

Does it matter that our politicians panicked in the early 2000s? Surely better safe than sorry?

Here's why it matters. Our current policy carries not just huge economic costs, which hit the poorest people hardest, but huge environmental costs too.

We are encouraging forest destruction by burning wood, ethanol and biodiesel.

We are denying poor people the cheapest forms of electricity, which forces them to continue relying on wood for fuel, at great cost to their health.

We are using the landscape, the rivers, the estuaries, the hills, the fields for making energy, when we could be handing land back to nature, and relying on forms of energy that nature does not compete for – fossil and nuclear.

But there is a further reason why it matters. Real environmental problems are being neglected. The emphasis on climate change as the pre-eminent environmental threat means that we pay too little

attention to the genuine environmental problems in the world.

We bang on about ocean acidification when it is overfishing and run-off that is most hurting coral reefs.

We misdiagnose climate change as the cause of floods when it is land drainage and urban development that is the cause.

We claim climate change as the cause of extinctions, when it is invasive species that disrupt and damage ecosystems and drive out rare species.

We say climate change is a threat to air quality, when it is climate policy that has hindered progress in improving air quality.

We talk about losing seabird colonies to warming seas and then build wind farms that slaughter the birds while turning a blind eye to overfishing.

Here's why I really mind about the exaggeration: it has downgraded, displaced and discredited real environmentalism, of the kind I have devoted part of my life to working on.

I have worked on wildlife conservation projects in India, Pakistan and elsewhere. Climate change is the least of the problems facing birds like the western tragopan, the lesser florican, the cheer pheasant and the grey phalarope, rare species that I once studied and published peer-reviewed papers about.

The climate obsession has used up money and energy and political will that could have been used for getting rid of grey squirrels, for protecting coral reefs, for preventing deforestation and overfishing, for weaning the rural poor in Africa off bushmeat and wood fuel.

Please remember that the IPCC agrees with me that, in terms of its economic impact, climate change is a minor issue. Once again, I am not departing from the consensus.

The opening words of the executive summary of working group 3's report on the impacts of climate change in AR5 read as follows:

> "For most economic sectors, the impact of climate change will be small relative to the impacts of other drivers (medium evidence, high agreement). Changes in population, age, income, technology, relative prices, lifestyle, regulation, governance, and many other aspects of socioeconomic development will have an impact on the supply and demand of economic goods and services that is large relative to the impact of climate change."

That's the IPCC's consensus view.

Renewables

And here is the maddest thing of all. Current policy is not even achieving decarbonization. Whatever your views on the urgency of reducing emissions, the policy of subsidizing renewable energy is not achieving it.

Switching to biodiesel or ethanol actually increases emissions. So does burning wood in power stations. So does solar power in cloudy Germany. So do wind farms because they prevent the replacement of coal by gas or nuclear.

In 2012 Bjorn Lomborg calculated that 20 years of climate policy had reduced global emissions by less than 1 percent. During that time the world had spent more than a trillion dollars to subsidize wind and solar power, yet between them they had still not achieved 1% of world energy provision. In this country (the UK), they have just passed 2%.

In Germany, a 20% increase in renewables between 1999 and 2014 has resulted in no change in emissions at all.

Testifying to Congress in 2014, Professor Judith Curry, chair of Earth Sciences at Georgia Tech University said:

"Motivated by the precautionary principle to avoid dangerous anthropogenic climate change, attempts to modify the climate through reducing CO2 emissions may turn out to be futile."

Winning the argument

When Nigel Lawson set up GWPF (Global Warming Policy Foundation) in 2009, virtually everybody agreed that global warming was the greatest threat to humankind in the twenty-first century. Now almost nobody except those with a vested interest thinks that.

The proportion of Americans who are not worried at all about global warming has doubled since 1990. [Gallup poll, 1989-2015]

The presidential candidates are not talking about climate change because voters consider other issues more pressing. In one recent poll of Americans, just 3% said they think climate is the most important issue.

Most devastating of all, to those who have spent a fortune on propaganda, in a huge United Nations online poll of people all around the world, called My World (see link for chart), to which almost ten million people have now responded, "action on climate change" comes dead last, 16th,

and by some margin – well behind the 15th priority, which is phone and internet access.

The skeptics, with their shoestring budgets, with zero public money, under constant assault, are winning the argument.

Thank you.

Matt Ridley is the author of The Rational Optimist, and as 5th Viscount Ridley is a Member of the British House of Lords. His latest book is The Evolution of Everything: How New Ideas Emerge.