THE LUNAR SOCIETY

PANEL DEBATE
at
TOWN HALL BIRMINGHAM

Birmingham's response to climate change: How radical should it be?

TUESDAY, 14 OCTOBER 2008

chaired by Sir Michael Lyons

Professor Kevin Anderson, Energy Programme Leader, the Tyndall Centre
Professor David Henderson, former Chief Economist, OECD
Lord Lawson, former Chancellor of the Exchequer
Professor Jacqueline McGlade, Executive Director, European Environmental Agency
Michael Meacher MO, former Minister for the Environment
Julian Morris, Director, International Policy Network

Sir Michael Lyons: Good evening and on behalf of The Lunar Society let me extend a very warm welcome to tonight's Climate Change Debate.

I don't think there could be a more fitting home for our discussions than Birmingham's beautiful Town Hall which has been at the heart of controversy and debate in this city since it first opened in 1834. Of course what you see around you tonight is the result of an ambitious refurbishment undertaken by the City Council with support from The Heritage Lottery Fund and others and the hall reopened just about a year ago tonight.

As you know, The Lunar Society's origins go back a little further, to the late 18th century when the original Lunarmen gathered in Birmingham for lively dinner conversations that literally shaped the modern industrial world. The Society was named after its practice of holding meetings on the night of the full moon so that members could make their return journeys from Soho House in Handsworth in safety. Amongst their number were some of the truly great names of West Midlands history including Erasmus Darwin, Matthew Boulton, James Watt and Joseph Priestley. The modern Lunar Society which has several hundred members continues to promote debate and seeks to link social, economic, scientific and cultural thinking on issues of critical importance to the common good.

The Society's recent interest in tonight's topic "Climate Change" can be dated back to 2006 when the annual lecture was given by the Chairman of the Royal Commission on Environmental Pollution, Sir John Lawton. Since then The Lunar Society has been encouraging this city region to become a global leader in meeting the challenge of climate change.

So, two years on, tonight gives us the opportunity to hear the views of some of the most respected thinkers on all sides of the debate here in the United Kingdom and they will be focussed on the question *Birmingham's response to climate change, how radical should it be*?

Now before we begin it's right that I give some particular thanks to our sponsors for this evening without whom we simply wouldn't have been able to stage this debate: Martineau Solicitors, Anglian Water, Birmingham City Council, Birmingham International Airport and Midland Heart. Thank you all.

There are just a few parish notices for us. There are no plans for a fire alarm test this evening you'll be pleased to hear but the bad news is that if the alarm rings, it's a serious matter and I'd like you to please evacuate via the fire exits and follow the instructions that you'll be given by stewards.

As you can see, we are recording the event and I'd like to thank the final year students from Birmingham City University for their help in doing that. The Lunar Society hopes to have extracts of the debate and of the discussion on its website in due course. It leads me to reflect how rich we would be today if that'd been possible in 1790.

Finally, can I ask for all obvious reasons for each person to reflect on whether their mobile phone is firmly switched off and if it isn't could you give it the right attention at this moment please.

So let's turn to the debate. We have 90 minutes set aside for what I'm absolutely sure will be a riveting event and I'd like to turn to our distinguished panel to thank them for joining us and to introduce them one by one.

Professor Kevin Anderson leads research on carbon reduction measures at the Tyndall Centre for Climate Change at Manchester University, and believes that there's an urgent need to start bringing down our collective demand for energy.

Professor David Henderson from Westminster University, formerly Chief Economist at the Organisation for Economic Co-operation and Development, the OECD, is altogether more sceptical. In 2006 he co-ordinated a dual critique, scientific and economic, of the Stern Review.

Michael Meacher MP is a former Labour Minister of State for the Environment. In Government he spent many years grappling with the policy dilemmas that the climate change debate throws up and since leaving office has campaigned for what he calls breathtaking initiatives to deal with climate change.

Lord Lawson is a former Energy Minister but is much better known as a former Conservative Chancellor of the Exchequer and author of the recent book *An Appeal to Reason – A Cool Look at Global Warming*. I think the title gives us a pretty clear view of his views on this topic.

Professor Jacqueline McGlade is the Executive Director of the European Environment Agency and although she works in a diplomatic world seeking solutions at a European level she is tonight prepared to resort to undiplomatic language to underline the need for urgent action to counter global warming.

Our final panel member is **Julian Morris**, Director of the International Policy Network. He has no such executive responsibility for forming policy but that doesn't make him shy about voicing his bracing free market critique of those who do.

Welcome all, thank you for joining us tonight.

Now we are loosely following the format of BBC's Question Time except that this is a truly impartial Chair that you have tonight. I'll be asking panel members a series of questions that have been provided by some of you and some who aren't able to be with us tonight. I hope to be able to bring some of you into the debate as we go through and if time permits.

Let's get started and the very first question comes from **Dr Stephen Smith**.

> **Is it possible that climate change is a natural planetary event and not man made and therefore cannot or should not be compromised?**

Now for this opening question I'm going to give each member of the panel a chance to come in but I'm going to start with Jacqueline McGlade.

Jacqueline McGlade

Thank you very much. I think one should take a long view and look back over 130,000 years and see that yes the planet does fluctuate but what we have witnessed in the last 10,000 years is a period of immense stability in which actually humans have developed. Run forward 150 years ago and we started the Industrial Revolution and it is pretty obvious from every record that we look at that round about that time the carbon dioxide emissions were beginning to

increase but more importantly it took us out of a period which we were in a sense able to document, had all natural causes, volcanic eruptions, changes in solar attenuation and flaring. So in the last 150 years what we have seen is an unprecedented and I use that word very carefully and in a sense very scientifically, an increase in carbon dioxide that's taken us from about 280 parts per million to 383 and every observation that we now bring in from the planet, not just models, observations, tells us that we are even now outside of the most conservative models for carbon dioxide emission projections.

So in a way, I'm really looking to my co panelists to tell me why I should not believe the real observations from the ground which tell me day by day, place by place, that the planet is actually taking on more carbon dioxide in the atmosphere and is less able to cope with it and the direct effect of that is that we are seeing differential warming all across the planet. I can come to any reason just to tell you there are even for Europe comprehensive analyses from every single part and walk of life that will tell us that things are changing and they're changing in the wrong direction, so I won't belabour it but I am not only convinced but I have to say that even sceptics who I meet are now becoming even more convinced.

Sir Michael Lyons: Nigel Lawson, I think you take a different view.

Lord Lawson

I take a different view about the second half of what the professor was saying but I agree with her on the first half and I think it is important not to confuse the two, but may I first say how pleased I am to be here in Birmingham in this wonderful historic building and I congratulate The Lunar Society on having a debate on this highly complex but important issue where there is a balance of views. That is all I have to say and I wouldn't like to say it behind your backs, I would say it to you, that is a huge contrast with the behaviour of the BBC which is notoriously biased, slanted on the issue, so much so that I don't even need to give chapter and verse although I am happy to do that privately afterwards if you would like. The BBC's behaviour on this issue is little short of a scandal so Birmingham comes out of it very well indeed.

Now on the two halves of the question; Of course there has been this huge increase in carbon dioxide emissions and therefore carbon dioxide concentrations in the atmosphere, largely due to the activities of mankind since the Industrial Revolution as she quite rightly said. Carbon dioxide itself of course is not pollution, people who tell you it's pollution are telling you a lie. Carbon dioxide is a life force, it is what plants need, plants can't survive without it and without plants we couldn't survive, animal life couldn't survive.

The question is, has it had an effect in making the temperature of the plant a little bit warmer It probably has to some extent but how much is very uncertain. Very uncertain indeed, nobody knows. The official body set up by Governments to advise them, the inter-governmental panel on climate change says that they think that most of the warming in the latter part of the 20th century was due to increased carbon dioxide emissions, maybe it was, maybe it wasn't.

A poll of climate scientists, the only thorough one done by Professor Hans von Storch who is the Professor of Meteorology at Hamburg University and incidentally, who takes the majority view, finds that 70% of the climate scientists think that's right but 30% think it's wrong, so there are two views, the science is anything but settled. Even the majority don't think the warming that there's been is entirely due to carbon dioxide emissions, there are natural forces at work on the climate, there always have been, that's how you had the mediaeval warm period in around 1000 AD which is well attested to. The carbon dioxide emissions have been increasing faster during this century than ever before because of the huge growth in China.

Very many people are not aware that in fact there has been no further global warming this century at all, the official figures covered by the Met Office, the Hadley Centre, that branch of

the Met Office, show absolutely no increase at all, that didn't stop the BBC saying, latest figures show further global warming, even though the figures themselves showed nothing of the sort. So it is very uncertain. It is also not at all certain that even if there is some warming and there was half a degree of warming in the last quarter of the last century perfectly true, it is very uncertain as to whether this is at all damaging because in some parts of the world and some aspects it has beneficial results, in other parts of the world, other aspects, it has harmful results and where the balance is struck is very unclear. This is the last point I'll make on this question, these same climate scientists, 500+ of the most accredited climate scientists in the world, were asked "what do you think is the most serious problem facing mankind this century". How many do you think said either climate change or global warming Precisely 8% and these were climate scientists. So the hysteria that we have on this issue is totally unwarranted and that is why I called my book *An Appeal to Reason*, I think we've got to look at this issue as a complex issue, it's a difficult issue, it's an important issue, we've got to look at it rationally and coolly and calmly.

Sir Michael Lyons Well here you've got a sense that the battle lines are drawn and let me bring Michael Meacher.

Michael Meacher

Well I think Nigel Lawson is quite right when he says that the situation is more complex than to assume that the cause of the rise in average global temperatures is simply and wholly and exclusively to be put down to the rising concentrations of greenhouse gases in the atmosphere. I do believe and I think there is very good evidence for believing that they are the major factor but it is certainly not exclusive. How you disentangle in climatology the effect of the rising greenhouse gases from other effects such as solar activity, such as volcanic activity, such as possibly cosmic rays and such as the intensity of the sun and probably the role of clouds in the atmosphere, all of these, probably in much lesser degree, do have some influence but the key point I think is what Jacqueline said, is that you have to look at the evidence over a very long period of time, not just in the last century or the last quarter of the last century.

The best evidence we have for that is the deep drilling that was done at the Vostok Station in Antartica, which was able to get specimens which give us information about the climate stretching back very nearly half a million years and that shows and this is the really significant point, that the main greenhouse gases, CO2 and methane, operate almost in lockstep with average global temperatures throughout that period of time. So I don't think there is any doubt that the concentration of greenhouse gases as Jacqueline says, has gone up from 280, I thought it was 387, it's rising by something like 1, 1½ , 2 per year and what the scientists are saying is that when you get to the level of 450 let along 550, very serious consequences will follow.

We're already beginning to see some of those in the early stages of climate changes, extremely unusual weather patterns both in terms of hurricanes, the ferocity and intensity of hurricanes, flooding, at the other end the extreme, much more desertification, loss of crop lands, we are seeing mega droughts on a scale. These have of course happened in history but it's the scale of what is happening and the concentration of these at this time which I think is extremely worrying. In Northern China, in Western America, in the African Sahel and what is I think is really worrying is the last time we had a major melt on our planet which was 3 million years ago but we are talking about the longer picture, when we had a major melt, sea levels rose by 25 metres and when they did they rose exceedingly fast, by 20 metres over 400 years only and since nearly all of our major cities are on the coast or on rivers you have nuclear dumps, chemical waste dumps around the coast, this is extremely worrying and I think the only sensible way of behaving, prudent way, is to take the precautionary action now rather than waiting for a point where it actually may be irreversible.

Sir Michael Lyons : Julian, can I look to you for an opening statement?

Julian Morris

Well, like Nigel, I'm honoured to be amongst this audience and here in a debate organised by The Lunar Society which of course honours people like James Watt who invented a device which of course has contributed to the emissions of carbon dioxide. Importantly, the steam engine contributed not only to the emissions of carbon dioxide but to enormous wealth, the wealth of Birmingham, the wealth of the United Kingdom, the wealth of much of the world, owes itself in large measure, to the generation of energy from fossil fuels. We wouldn't be sitting here today under these lights in this wonderful building but for that fact. So we have to take into account the enormous benefits that are generated as a result of the use of these very inexpensive forms of energy in society, but to get to the question, I was struck by all of the responses so far, which, given different perspectives, but especially Michael Meacher's point that we have seen over the course of half a million years, dramatic changes in temperature caused by nature.

If the Earth's climate can change dramatically in the space of only 400 years as a result of nature, surely we should be concerned not only about man, but about nature and take into account all of the possible harmful things that can happen to mankind. Yes, mankind may be contributing to a rise in temperature, it's quite plausible that that rise in temperature caused by man will be gentle, in fact if you look at the inter-governmental panel on climate change forecast, if you can call it a forecast, for the next hundred years, it says that the temperature is going to rise by between 1.6 and 3.8 Celsius, that's the median forecast.

My organisation commissioned a series of studies by some of the world's leading experts on agriculture, forestry, climate related disasters and economics and that assessment concluded that the implications of even a temperature rise of around 3½ to 4 degrees Celsius could be dealt with by mankind at relatively low cost through adaptation. We have to look at ways of adapting more effectively but it can be dealt with by adaptation.

So the thing that we might want to be concerned about is not so much those median scenarios but dramatic changes in the world's climate that might result either from man or from nature and in that respect I think that we should broaden the debate away from looking at purely trying to control carbon dioxide emissions with all of the impacts that that would have for our use of these wonderfully wealth generating burning of fossil fuels and look at other strategies. Look at geo-engineering, look at the possibility of reducing temperature on the planet if we need to or increasing it if we need to. What would happen if instead of going into a massive temperature rise, suddenly the climate flipped and became cold, what would we do then I think that it behoves us to understand better what is causing these changes in the climate, be it man, be it nature and look at ways of addressing those changes, not from a purely narrow, let's focus on carbon dioxide perspective, but much broader.

Sir Michael Lyons: David Henderson.

David Henderson

Thank you Chairman.

I am an economist, I'm not a climate scientist, but I came into this subject by accident rather than as a late evening of life career plan just a few years ago and I am not well qualified to answer a question as to what extent climate change is natural and human induced. My impression from reading, talking, arguing is that both are involved, clearly there were changes in the climate long before the increase in carbon concentrations arising from human activities, from greenhouse gas emissions, so that both factors are at work and are probably still at work.

I think myself that the most important single fact to start with is that this, not really a surprise for an economist because we're very conscious of how little we know about our own systems, we're dealing here with an extraordinarily complex system, a set of inter-locking systems, which even now is not well understood. I am very doubtful therefore about whether one could go as far as people like Michael Meacher and attribute it to recent extreme events, to the increase in the concentrations of greenhouse gases in the atmosphere and I think that right now, what concerns me in a way more than the exact answer to the question, is whether even now the enquiries are sufficiently objective and sufficiently meticulous and sufficiently well documented into what exactly is happening to global average surface temperatures and the reasons behind that so I take a rather cautious view, both are involved. I think probably there is significant effect from the rise in greenhouse gas concentrations which in itself has arisen from human activity and through eugenic level warming, I think it's going too far to say that this is clearly a dominant influence although that is the view of the inter-governmental panel on climate change and has been for 16 years and I think that something that has preoccupied me increasingly so I'm getting more involved with this subject, I am very concerned about the basis on which policy is adopted.

If we go down the road that Michael Meacher would like of drastic and immediate action, the more drastic that action and the more immediate it is, the higher the cost. The cost may be worthwhile, he may be right but one can't get away from that, the more radical the action, the greater the risk of high risk. Since the risks are so great on both sides, I personally would like to see more serious efforts than trying to establish the facts and the relationships involved and if I were still a Treasury official which I was many years ago in an unimportant capacity, I would want to try and see that some effort was put into this outside the existing advisory process.

Sir Michael Lyons : And finally, Kevin Anderson.

Kevin Anderson

Well I'm in many respects in agreement with David. The climate is a complex issue and we don't understand it particularly well, I would also take a cautious approach but my cautious approach leads me in a different direction from David's conclusions.

There are two issues here and we've heard a lot about the science and science is just one part of the issue. The bit that goes with the science are the emissions and it's only when you ally the science with the emissions can you make any useful statements about climate change, so let's just think quickly about the science.

Broadly, everyone agrees the greenhouse effect occurs, without it, we'd all be good skiers because the Earth would be about minus 18 degrees temperature, the average temperature is about plus 15 because of the greenhouse effect. Now that is agreed by everyone, everyone in this panel would accept that. What is the principal cause of the greenhouse effect Well there are a range of gases that are involved, but one of the very significant gases is carbon dioxide. It's the most important of the greenhouse gases but actually water vapour itself, which is a vapour, not a gas, water vapour is actually more important. Probably 60 to 70% of the greenhouse effect is due to water vapour, but water vapour is a product of the temperature and the temperature is principally a product of these other greenhouse gases so the water vapour itself is an outcome of the greenhouse gases.

Now, we know the principal greenhouse gas is carbon dioxide and we know it's gone up since the industrial revolution. We can measure that and there's agreement about that and there's a radioactive fingerprint difference between fossil fuel carbon dioxide and other forms of carbon dioxide if you like, so we know that the rise in CO2 concentrations in the atmosphere are due to our use of fossil fuels. So we know what the greenhouse effect is, we know carbon dioxide is a major mechanism within that, we know the concentrations have gone up very significantly.

There are some uncertainties then about how the Earth would respond to that, so you take your scientists and you weigh them for and against and that's polarising it too simply, but broadly, the broad body, the orthodoxy of the science is that the feedbacks of the planet are likely to make the situation worse.

So your choice then is when you're having breakfast with your child, is to think, the greenhouse effect is understood, CO2 emissions are going up and the majority of scientists, but not all, think that the globe will actually exacerbate the problem brought about by the greenhouse gases. Are you prepared to take that risk with your child I've got two nieces, I'm not prepared to take that risk. You'd have to be a very keen gambler to take those sort of odds.

Let's now add to that, that's the science, let's add the emissions data to that. The Rio Summit was in 1992, the Earth Summit and you would have thought post that emissions would have started to maybe, we've been concerned about climate change apparently, at least the rhetoric's been there, what's happened to the emissions? The emissions have rocketed. The growth rate in emissions is going up faster in this century than it did in the 1990s so Stern was completely wrong in his analysis because he used two 1990s type growth rates when in fact it's been much much higher than that in the 2000s. So now we have the issue of the carbon dioxide as a principal greenhouse gas and next we have the growth rate in that gas going up very rapidly indeed. Now given that you've got those two together, the emissions are broadly out of control at the moment, growing at about 2-3% every single year around the globe, not going down, going up, including from the OECD countries. So you've got climate change being well understood and the emissions data going up and I just think it's an issue of risk and I'm not prepared to take that sort of risk with my nieces and I ask you to answer that question for yourselves as to whether you're prepared to take that risk or not.

Sir Michael Lyons : So there we have some opening statements in response to that first question and I think it will be clear to you all that The Lunar Society has searched long and hard to find almost a wide range of views as it's possible to get on this subject.

I'm going to go on to our second question now and it comes from Tracey Carty and it strikes a very topical note.

"Would the panel agree that the credit crunch will pale into insignificance compared with the climate crunch"?

Now no better person I think to start than a former Chancellor of the Exchequer, Nigel Lawson.

Lord Lawson

Well obviously if you take this hysterical view about the consequences of temperature change that Michael Meacher put out, if you take that view then it's obviously more serious than the credit crunch and I think most people have enough common sense to realise that life is hard and life is earnest and that the credit crunch and the economic problems that we're facing at the present time while we're on the brink of quite a prolonged recession I think although not a depression, nothing like the 30s, but quite a prolonged recession, that is going to pre-occupy people a great deal, particularly because as I say this whole thing is so uncertain.

There's another thing you know, I'd like to cheer you all up, having just said we're going to enter a recession and you heard all this alarmist twaddle from Michael Meacher, the forecast for the next hundred years, the forecast of the IPCC scenarios, which are the forecasts on which the Stern review is based, are that this century is going to see, they have different scenarios, sometimes by a small margin, sometimes by a large margin, but this century is going to see the biggest rise in living standards worldwide of any century there has been and this is going to be particularly pronounced they forecast in the developing world, which is great, so that's the good news.

You may say it may not happen, well if it doesn't happen, there's not going to be this great increase in carbon dioxide emissions and concentrations in the atmosphere which they project. It is entirely on the basis of this wonderful growth and this wonderful growth in living standards that they project the warming which they do project. I prefer warming to climate change because of course climate change are such weasel words, the climate is changing all the time, it always has done, it changes in different parts of the world, in different ways. The climate in different parts of the world is different and everybody manages to adapt to most climates, but the real issue is, is this is a disaster

Now I think that to be on the safe side and it is something to be prudent, it's the right approach. That is what I do in the book that I have written, I say, well, it is very uncertain, science, but let us suppose that this majority, this 70% of climate scientists or whatever it is, this majority who think that it the carbon dioxide emissions are the main factor, not the only factor, but the main factor in the slight warming that there was in the last quarter of the 20th century, there was no warming in the third quarter of the 20th century, there's been no warming at all in the 21st century so far, despite unprecedented increases in carbon dioxide. Let's suppose that they are right and their projections are right. On that basis, let us look at the projected increase in temperatures that they say is going to arise and look at the damage they think it will do, which is a very greatly exaggerated amount of damage because they assume that adaptation is to a large extent not going to take place, which I think is quite unrealistic.

Even then, you find if you do the basic economics to the cost benefit, you find that the cost of going to much more expensive energy, because that's what we'd have to do. If you departed from carbon based energy to go to other forms of energy, it would be much much more expensive, that is why people haven't done it already, they've chosen the cheapest form of energy. That is a very very heavy cost in terms of economic growth and future well being, not just for this generation but for our children as well and our grandchildren too. The benefits are almost certainly less, so it doesn't seem to stack up, but maybe if we feel good about it we can do that.

What is quite clear is that it makes no sense to do it at all unless everybody is doing it but it is a global problem. Unless you can cut back on global emissions drastically, pretty well the target now is said to be 50-60% by 2050 and pretty well 96% total decarbonisation by the end of the century, unless there's a global cut back, it's going to have no effect at all, it can't have any effect, that's scientifically obvious.

The Chinese and the Indians, to take the two most important countries, have made it absolutely clear that they're not prepared to do that and I think they are right because their primary need is to get millions of their people out of poverty, malnutrition, disease and premature death as fast as they possibly can and that means using the cheapest form of energy and they are quite right to do it and those who want them to go to more expensive energy, which is what they have to do to contribute to this global solution which I think is mistakenly recommended, means that millions and millions and millions of people are going to suffer unnecessary poverty, suffer unnecessary malnutrition, suffer unnecessary disease and premature death, simply because we have this hysteria over the effect of very gentle, very slight, warming of the Earth's temperature.

Sir Michael Lyons : Jacqueline McGlade.

Jacqueline McGlade

I felt very contained, I shall now let loose. Where to begin Let me just go back to the opening statement that I made. I was trying to be, let's put it this way, short and to the point but of course you can have the 90 minute lecture.

The evidence is overwhelming. I'm a personal witness of ice caps melting, of drought, of disease spread, of other things. They can be as alarmist as you want them to be, they can be as passive and as quiet as you want them to be, but take my word it is happening and whether you wish to take a prudent or an imprudent stand tonight, when you walk out of that door, I hold every one of you accountable if you are not prepared to do something to fight climate change. That's the first thing.

The second thing is, the science is incontrovertible, when it comes to bringing back evidence as to where we actually are today, so you can put aside the IPCC models and actually look at what the global carbon observatory, what the sea surface temperatures are sending us and I can tell you for a fact, whether you like to believe it or not, that the observations from across the planet are telling us that we are already outside of the bounds of where we thought we would be. The planet cannot absorb as much carbon as it could by 5% over the last forty years, so we're hitting the buffers already in the efficiency of the planet to deal with the extra carbon dioxide in the atmosphere and so on and so on. The point I think that the science tells us is that the long view that we add that things would take longer, actually every one of those areas, whether it's yields of agriculture, bio-diversity, water, wherever you go, it's happening quicker than we ever would have projected.

So those are the kinds of words of warning, but now let me come to energy. Let me come to some of the drivers which really I think are what's at the back of all of this.

Yes, fossil fuels are cheap, but at what cost We've actually paid the burden of that through a whole series of issues. One is health, the burden of evidence and the burden of exposure to fossil fuels has not come without a health cost. Secondly, there have been massive subsidies on the, what I would call, traditional fuels. Estimated using OECD and working with your colleagues in OECD in 2005, we estimated that the fossil fuel subsidies in Europe alone were 35 billion Euros, the subsidies from renewables were 5 billion. So, let's talk about level playing fields, 82,000 Euros per German coal miner doesn't strike me as being a particularly good way to continue to put energy into the system. When it comes to absolute costs, why is it that other countries, why is it that other communes, that other cities, have made that transition and it hasn't been a massive cliff edge hanger in terms of cost and we've actually got multiple communities across Europe that are actually running on clean energy, they've come off the grid and they are not fossil fuel dependant. So it is possible, it is absolutely possible in today's market place, even without subsidies, to make yourself a clean environment through the renewable energy and we can have that discussion as well a bit later on.

Let me come back to the consequences. If we get this wrong and we decide to wait 10, 20 years, then I think we really will be looking at ourselves in a very different world and this is really serious because China, I'm afraid I have to contradict my panellist, I've just received the China climate change package proposal, actually not their proposal, what they're planning to do. It just came out a couple of days ago. Their targets are more aggressive than we have in Europe and what they're saying is that if Europe cannot step up in the next few weeks in the place called Posnan and actually vote in the energy package and all the other things, that they will challenge Europe to come up and meet their challenge in terms of target setting. So, the Chinese are not prepared to compromise on wealth and ways of living and quality of life, but they are prepared to say today that they will find ways to feed their population, clothe their population, keep a GDP that is decoupled from an energy from which emissions arise and actually saying to the rest of us, well, if we can do it, then so can you.

One final thing, please do not confuse India and China, they are totally different economies. One is a rural economy, the other is an industrial economy. They have completely different trajectories and they should be treated very carefully and very differently when it comes to what their role is in the future of climate change.

Sir Michael Lyons: I'm going to ask for a slight change of pace from this point and for very very much shorter answers otherwise by the end of the evening we'll have only covered four questions. At that point, I am eager to try and bring some of the audience in from time to time and if I look to Tracey Carty, is she in the audience tonight? Tracey, do you have a view on this?

> **Tracey Carty: I think the point I'd like to make is that there are actually similarities between credit crunch and climate change. I heard someone recently say that they felt like jumping off a building, that feeling it's happening to him [. . .] with climate change, will hit the ground pretty hard really, with devastating and irreversible consequences. Now, we can bail out the credit crunch but unfortunately we can't bail out the climate.**

Sir Michael Lyons: Thank you very much. Time I think for two very quick comments. David Henderson as an economist, do you want to come in on this?

David Henderson

Clearly this is a very serious problem in assessing risk that we're dealing with a system which is far from being well understood. I don't disagree with what Kevin was just saying about the case for precautionary action and in fact I have advocated precautionary action and we shall be coming to that later. I would stress the risk of credit crunch is short term and this is something a century or two centuries ahead so they aren't directly comparable so I won't try to weigh them together.

Let me just say that the risks are not on one side here. It is also possible, though this is a minority view, it's also possible that if we go down the path which Michael and Kevin think is only prudent, we shall find in due course, probably not in my lifetime, that quite significant costs are being imposed on people right across the world in aid of an objective which on closer examination in the light of further experience and knowledge, proves not to have been well chosen. You may say that's alright, that's a risk that we should take in our stride, it depends how far and how costly that experiment goes and I'm quite concerned with the way in which quite very costly actions are already being taken by governments on the basis of evidence which is not well examined and an atmosphere which is increasingly less tolerant of minority opinion.

Sir Michael Lyons: Now we're going to come back to this issue of the possible choice between planet change and economic development later in the evening and perhaps give you a chance to vote on that but let me bring Kevin in for a quick comment.

Kevin Anderson

There's one similarity here between the two, well there are set boundaries. One's time, obviously in the very short time, the credit crunch is very important to a lot of people, generally people who actually are not the major causes of climate change. I earn £52,000 a year and I would have guessed that most people on the panel here earn 2, 3 or 10 times that and we are in the top few per cent of the major emitters, so we are the causes of climate change on this panel and we will not be affected by the credit crunch significantly. We might have to sell one of our holiday homes or something along those sort of lines but it's hardly going to affect the causes of climate change. So there is an equity issue there that we can live out the credit crunch and carry on being profitable in our CO2 emissions. So time is a huge issue here, that in the short term obviously the credit crunch is very important but in 20 years from now it'll be almost forgotten, it'll be an interesting footnote in the history book and the climate change will still be with us. So time is an important boundary there, income is an important boundary there and thirdly, I would say the concern for others is an important boundary there, as to whether we feel we have any moral responsibility for other people elsewhere who have not caused climate change and will be impacted both by climate change and by the credit crunch, so I think there are three sets of issues there.

Coming up very quickly to Nigel's cost benefit analysis, it wasn't done for $100 a barrel, let along $200 a barrel, it was done for far, far lower numbers. If you do the analysis for fossil fuels at $100-$200 a barrel, if you factor in things like Iraq which is maybe a moral case but simply was a small issue to do with oil as well, put that into the costs then you start to find that in fact the renewables are often much, much cheaper and more reliable than are the fossil fuels.

Sir Michael Lyons: Now, Kevin wasn't to know, but he's rightly anticipated the next question which continues the discussion about who stands to lose and it's from **Debbie de Haes**.

"Will inequalities between the world's people be made worse by climate change. If so, do we as a rich nation have any moral obligations"?

Michael Meacher

Well, I think we do have obligations to developing countries and to the bottom billion who exist we are told on less than $1 a day and probably 2 billion on not much more than $2 a day. That is an enormous indictment of our world. It is also true that the impact of climate change, extremely unfairly and unjustly, is very largely visited on the Southern world and something like nine tenths of the casualties and the destruction has happened in the developing world, not in the rich world, though as Kevin said, unquestionably we are overwhelmingly the cause of climate change. It is our dirty industrialisation over the last 200 years which has created the problem which developing countries are now having to deal with. When one looks at flooding in China, one looks as the desertification in Africa, the loss of crop lands in South America, Latin America, I mean, all of these are very very major issues and we certainly have a moral obligation. The real reason we have a moral obligation is not just because they are poor but because we have caused we have caused something and we have it more in our power to deal with it than they do, because we are the major cause of it and at the moment, political action is pretty glacial.

When I was at the Kyoto conference in December 1997, there was an agreement that we would reduce carbon emissions by something like 5% by 2010 compared to 1990. It seems doubtful partly because America up to now has kept themselves out of it, it seems doubtful if we'll reach that. The real problem is that there are 185 countries in the world and those who signed up at Kyoto are about 30, the other 150 includes the vast majority of mankind so they are very much dependent on action that we take. It is also true of course that their reduction of 5% is nowhere near enough. It is broadly agreed scientifically that we need a reduction of something like 60% and many people are talking about 80% and indeed a decarbonisation of the industrial system across the world. So there is an enormous responsibility on us and I have to say I agree I think the one common point in all of this panel is that there are uncertainties about the theory. Where we differ is the degree of uncertainty and whether, as is my view, not hysterical, I think prudent and sensible, that there is enough evidence perfectly clear, not only to the scientific community but to any objective observers of the facts and of the evidence that already enough has happened to prompt much much further action and the responsibility lies squarely with us to initiate it.

Sir Michael Lyons: Julian Morris, room for agreement?

Julian Morris

There are clearly going to be differential impacts of different changes in the climate over time, whatever causes those changes.

Today, about 10 million children die every year from preventable and treatable diseases, from diarrhoea, from malnutrition, from various respiratory infections, from malaria and so on. It's hypothesised that a rise in temperature may make that situation worse but if it were possible dramatically to reduce, even eliminate all of those deaths by various interventions and it is definitely possible, with current technologies, then no-one would die from climate change

diseases in the future. A rise in temperature would make winters warmer, it would also make summers warmer, but more people die on the whole in winter from cold than die in the summer from heat exhaustion. It is certainly true in all of the places that we have good data on. So, a rise in temperature might even be a good thing for those people.

Economically, it all depends on what is done at a political level and I don't mean what is done in terms of controlling carbon emissions although that is a factor. Mainly what matters for economic development is the governance of a country. We're rich in Britain, we're rich in Birmingham, we're rich in the western parts of the world, what we call the western world or some people call the north. Why are we rich in these places Largely because we have institutions, we have the ability to own and exchange property, we are able to engage in entrepreneurial activities that benefit all of us. In poorer parts of the world entrepreneurship takes place but it's suppressed, governments force people to have licenses.

In India they've gradually been getting rid of a thing called The License Permit Raj System which basically benefited a very small minority in the elite, this was created hundreds of years but was made worse by the British colonists and then was perpetuated after the colonial system ended in 1947. This system continues and it benefits the elite at the expense of the masses which is why India is still predominantly rural, it's why 800 million or so of the billion people in India are rural, but China isn't that much better.

You say that it's an industrial society. I'm sorry, but a billion of the 1.3 billion people in China live in rural areas and those people, if they're going to live better lives are going to be using more technologies, they're going to be using especially in the first instance, for example, fertiliser, pesticides to improve the efficiency of their land, they're going to be using tractors so that they can farm more efficiently, they're going to be transporting goods using fossil fuel powered vehicles and they're going to be refrigerating goods using fossil fuels. There's going to be a dramatic increase in the use of these fossil fuels in those countries if they're to develop.

So, we've got to be very careful when we talk about the impacts of climate change and not to forget the impacts of taking action to address climate change. Yes, it may be worth cutting back on carbon emissions over the long term but the economic analyses that have been done and many many have been done, apart from the Stern review, have suggested that the best trajectory for addressing climate change in terms of reducing carbon emissions it to start very very gently, because if you start with a big shock to the system you will create a credit crisis, in fact the credit crisis, just to get back to the last question, is an interesting analogy because one of the fundamental causes of that was under-pricing of money. Here, we're undervaluing, if we take this, let's cut emissions dramatically now, if we take that approach, what we're doing is undervaluing the impact today on people who are relatively poor compared to people who are going to exist in the future according to those who demand action. I think that's quite perverse. It's basically a transfer from poor people to rich people, now is that morally justifiable?

Sir Michael Lyons: The next question takes us onto the role that governments might play and it comes from **Jack Shepherd**, who asks:

> **"In a democratic society, how radical can a government's interventions to affect individual behaviour actually be"?**

I'm going to turn to David Henderson for the first crack at that, David.

David Henderson

Well, if there's consent, the actions can be fairly radical and there have been plenty of examples of that in history. It wouldn't be easy to manage a radical process, but one could imagine it taking place.

Let me just give you, following from the last question, a sketch of a possible radical future. I've just been reading a report by a fellow economist in Australia, a sort of Australian counterpart to the Stern review in which the author takes the view that over the not so long term, the only possible reasonable solution to the problem of controlling emissions is that countries should agree so that the right principle is to have equal emissions per head and that means extraordinary radical reductions on the part of the rich countries including ours. So I think if the case really appears strong then something like this could be done.

I personally think that that is not the right approach because again I disagree with Michael Meacher about the extent to which it is extremely [. . .] leading to [. . .] be plausibly attributed to a rise in concentrations of CO2. I don't think we're in a manifest emergency and I think that if we were to consider seriously radical actions that go much further than those that have already been taken which themselves in some cases have been and are continuing to be quite costly, we should have a much firmer basis of knowledge and enquiry than we now possess.

Jacqueline McGlade

I think that there's a point that we're arriving at where we have to radically change our concept of public good and it goes back to responsibility and equity and if I'm sitting in another part of the world where I don't have access to technology and I'm getting the pressure, let's put it this way, from Western Europe to do something about my emissions and I could be in China, I could be Brazil, I could be anywhere, I would be saying to them, ok, you have all these great innovations, you've got good technology, make it a free good. Don't come to me with an intellectual property right that stops me using it.

So I think there's a moment at which governments have to collectivise the intellectual solutions to what we're looking at and actually create opportunities for businesses downstream. So I think there's a core public good discussion that has to be held and ok, it flies in the face of a lot of commercialisation but I know from practical experience just what it is to create core public goods and services and then find how much actual benefit flows from that.

I'm actually very serious that one of the issues that we have is, through the energy sector, this idea that you can only contribute to the energy debate if you have big centralised solutions. You have big centralised solutions because it's easy for politicians. You've only got to make a couple of decisions, you know, one nuclear power plant there and a coal fired power plant there. If you want to give power to the people and you want to decentralise, you get into the messy job of having lots and lots of little decisions, access to technology and rolling it out. So I don't believe in all this statement about hysteria leading to catastrophic changes, the economy collapsing. There is a way to take us through a smooth transition over the next 10-15 years which puts in place these technologies, does not require the dead drop kind of political decision making, but what we would require is insight and foresight from governments to create the right environment in which these decisions could be made.

So coming back to, what can governments do, what is their responsibility, it's actually to look very very keenly at, not necessarily corralling more information, not necessarily making the cost benefit analysis for every case, because frankly we don't get the benefits right. Equity doesn't even really get its face properly on the table. We know the costs, we know how much it costs to put a power plant in, but when we talk about the benefits and the ancillary benefits and the disbenefits to the public, actually we don't see those very well articulated.

So I think government needs to take on a completely different view of how the economy could run, a different jurisprudence, a rights based approach for people and for nature and really shift the balance away from every single decision having to have a cost benefit analysis that works in the favour of profit motive. I think we should work for the public good and make

more things available for the rest of the world to work on. This is not a time to go and put your intellectual property and patenting rights in the bank.

Sir Michael Lyons: Now I've got the perfect follow up question to that from **Phil Davis**.

> **"Can a politician who puts climate change ahead of economic growth still be elected"?**

I am going to turn to our political sparring partners here and I'll ask Michael Meacher to begin.

Michael Meacher

Of course. Obviously governments can only proceed down a radical course if they have consent, that's obviously true, but what I do think is important is that one looks to government for political leadership. I want to make some comments about the British government, a Labour Government at the present time of which I am a member.

I certainly believe that we could do a great deal more and I say that, Britain together with Germany and Sweden, are probably the most activist countries within the EU in terms of climate change but I still think manifestly lacking. When I talk about political leadership, I'm not talking about raising taxes, forcing people to do things they don't want to, what I am saying is, do we actually have to have a coal fired power station in Kings North in Kent We certainly don't and the fact is that is going to have a worse impact on carbon emissions than any other single choice which the government could possibly make at this time. Do we have to triple airport capacity I'm not suggesting we prevent people flying but I am suggesting that to triple airport capacity if you believe in climate change targets is absurd. Why do we not say that the airlines should be subject to exactly the same targets of reducing their carbon emissions as every other industry is at the present time Why don't we say in regard to cars that we want to see a shift towards electric cars, towards hybrid cars, towards hydrogen fuelled cars, all of these are not immediately available but we could put a lot more resources into making them available.

My last point is on renewables. Let me ask you, how many of you realise that when it comes to the generation of electricity in Europe, if you look at our counterpart countries, Germany, France, Italy, Spain, they produce electricity 10-25% from renewable sources of energy. In Sweden and in Scandinavia, which is perhaps a special case, it's 30-50%. In the UK, being an offshore island with enormous opportunities because of wind, wave and tidal power, it is a pathetic 4%. What I say is in this country of ours we have a responsibility and we need leadership and I believe that we could get majority support behind these proposals if we had a government which believed in them and pushed them, advocated and promoted them with vigour and enthusiasm.

Sir Michael Lyons: Nigel Lawson.

Lord Lawson

Of course it is likely that politicians who talk this sort of stuff which I will be polite and say nothing further about, can be elected. That is why the leaders of all three parties are committed to this sort of thing, because it makes people feel good. It gets the sort of applause which you've just given. Of course they're doing it. They're doing it because they think they'll get re-elected on this, that it gives a plus. Not that they're doing anything about it, it's all talk. All talk.

I mean, Michael Meacher talked about Kyoto, he says that 5% reduction in Kyoto, that wasn't enough but it was a start, doesn't look as if we might get it. Doesn't look as if we might give it, despite all this talk, emissions from those who signed up to Kyoto have increased. There's never been such a disconnect between words and actions and it often is with politicians, but never never such a huge disconnect because they know that the people wouldn't tolerate the actual

measures needed but they know that it sounds terribly good to talk about it, particularly being a much more serious time because people want to feel good and we live in an age now where the belief, particularly in Europe, belief in the secular religion of communism has taken a knock, belief in the traditional religion of Christianity has decline. There is a kind of vacuum, people want to believe in something, so they believe in this kind of what David Henderson has rightly called 'salvationism'. It is the new religion which appeals to people but are they going to do it? No.

As for China, Jacqueline's remarks have been the most fanciful remarks I've ever heard for a long time, but she is right about one thing, there should be free technology transfer, I agree with her about that. That is only not going to scratch the surface of the problem, if indeed there is a problem. The Chinese, what are the Chinese doing actually They're in the midst of a 12 year I think or maybe longer multi programme of building a massive new coal fired power station every week. That's what the Chinese are doing.

What about the Germans Somebody said the Germans are so good, unlike us. The Germans as Jacqueline might have said, the second thing I agreed with, are massively subsidising their coal industry. We don't do that, quite right. The government of which I was a member decided that wasn't a very good thing to do. The Germans are doing it and I'm all in favour of abolishing coal subsidies and we should abolish renewable subsidies too, so let's have an agreement around all of this, we abolish all subsidies, that would be a good start and a good agreement.

I am concerned about the developing world. I'm concerned about the developing world in three ways, what our duties are to them.

First of all, if we are going to try and bully them into having higher cost energy than they need that would be a terrible thing. Maybe one day in the future, carbon based energy will not be the cheapest, fine, but at the moment it is the cheapest, the cheapest by a long way and everybody knows that, so it is wicked to try and make them pay more for their energy and suffer as a result. They suffer enough as Julian said at the present time.

It is also I think what we can do positively because the only sensible thing if there's some warming and there's no warming going on at the present time and there's no increase in extreme weather events at all, that's quite untrue. There's always been extreme weather events but all the scientists show that there's actually been no increase and even if there were it wouldn't prove that it came from warming but there hasn't been an increase. What if there is some warming and there might be, nobody knows, then we want to adapt to it. Temperatures vary enormously in different parts of the world and people have learnt how to adapt to them. This is happening gradually without doubt, but there is a problem for the developing countries, it may be difficult for the developing countries to be able to adapt despite all modern technology so I do think we have an obligation to help them to adapt. That's the obligation we have.

The final thing which is very very dangerous indeed and I think Julian touched on this, that there is the economic system, the free market economic system, which broadly we have, not perfect by a long chalk but broadly we have in the world, which has been extended now globally called globalisation, has brought enormous benefits to the whole world and particularly to the developing countries. It is now being suggested by Europeans, by the democrats in the United States, that if these countries like India and China and others are not prepared to cut back on their emissions, which they are not prepared to and Jacqueline is slightly mistaken on this, and they're not prepared to, then we should put tariffs against their imports because they are unfairly competing with us because they have cheaper energy than we do and that's unfair. So we should put tariffs. A relapse into protectionism would do far

more harm to the world economy and in particular to the developing world than anything that warming could do, so we've got to avoid that.

Finally a last quick point. I was interested in what Michael Meacher said but he refrained from drawing the logical conclusion. The logical conclusion of what he said was that the Industrial Revolution was the most ghastly mistake and should never have happened. I think if he'd said that in Birmingham, the heart and birthplace of the Industrial Revolution, that would have been a first.

Michael Meacher

If only I'd said it, I've said nothing of the kind.

Sir Michael Lyons: It's just possible we might return to that subject later in the evening. Let me just ask our questioner, Phil Davies, are you here No he's not, it's OK. Let me move on, because I want to just give a quick opportunity and can I underline quick opportunity to Julian to come in on this question and also Kevin.

Julian Morris

Well I think that I've already said mostly what I would say about the developing world so I'll address this question you asked of whether politicians get elected on a [. . .] but I broadly agree with Nigel. I think that this has become an emotive issue. Partly what's happened over the course of the past quarter century is this secularisation but there's also been a decline in people's belief in politicians because political decisions have been elevated away from the voting public. We now vote partly for national elections but partly occasionally we'll vote for some bods in Brussels or Strasbourg or somewhere where they do something and actually you know, that's the locus, the place where decisions on climate change in a political sense are mostly made in Europe. I mean, Britain didn't individually sign up to the Kyoto protocol, it was signed up for by the European Commission initially.

Jacqueline McGlade

No.

Julian Morris

Yes. There was subsequently a parliamentary decision which is unusual actually. Most of the countries in Europe didn't even bother with that, they just agreed with what had happened in Brussels. The point is that decisions have been moved away from the individual, decisions are made at the European level, they're made at the UN, so we feel disempowered. So what do we do when we're disempowered Well we go to other people that we think are reliable sources of information and it seems that groups that represent themselves as being in the public interest, even if they're actually not acting in the public interest, get our support, so we'll give our, I used to be a member of Friends of the Earth and I was also a member of the Worldwide Fund for Nature when I was a student and for a little bit afterwards. I even did some consultancy work for the Worldwide Fund for Nature so I'm obviously not completely evil. My point is that we give our money to these groups, why do we give our money to these groups, because we believe that they're doing good for the world. Politicians recognise that, they can see that people are voting with their wallets for those non-governmental organisations as NGOs that represent the "environment" (in inverted commas because what is the environment), but what's the natural consequence of that Well, politicians like to see themselves side by side with those groups because they can see that actually they're no longer, sad to say in some sense given that there are two politicians present, but politicians are in feebled if you like, with regard to the public. The public are much more interested in what the NGOs are saying so the politicians want to sidle up to the NGOs and if the NGOs are all singing in unison "hey, the world is going to end, we've got to do something about it" then unsurprisingly the politicians will also sing the same tune.

Sir Michael Lyons: Kevin Anderson.

Kevin Anderson

I'm not sure where to start here. Going back to the question as I remember it about three hours ago, could a politician be elected who, I think it was broadly going towards, pursuing action on climate change over issues to do with growth.

Well, politicians will be elected if we support them and they demonstrate leadership and there's a mutual supportive circle there, it's not just them and it's not just us, we work together and certainly there have been many times in the past where democracy has taken radical action, I mean I think there's a bit of radical action going on in democracy at the moment as far as I can gather with huge amounts of public money being pumped into private purses as far as I can see. That's fairly dramatic action and I hazard a guess that actually Gordon Brown has probably gone up in the polls during this process, not gone down in the polls. Now I'm not sure about that but I doubt it's weakened his position.

So clearly with the privatisations under Margaret Thatcher whether you agreed or disagreed with it, it was a radical action. 1947, all issues to do with welfare and some of the nationalisation that went on there, these were radical actions. We have had radical actions in the past. Having said that, I'm going to make you all glum because I don't think any of these levels of radical action are anywhere near approaching the levels of hysteria we must be aiming for.

I want hysteria. I'll say why I want it. We are in a car blasting towards the cliff, accelerating towards the cliff faster and faster, our scientists keep telling us there's a cliff ahead, not very far, you're getting faster and faster, eventually it will be too late to break and Nigel and his pals, they're discussing the velour of the fabric in the car, not actually trying to discuss. I mean, it's a bit like the Titanic thing, that we rearrange the deckchairs on the Titanic, when actually you need to steer it in a different direction, or to go a bit slower or take a different route, actually we're not even rearranging the deckchairs, we're just thinking about recovering the deckchairs prior to moving them around, hoping we're going to miss the iceberg.

This is a ridiculous situation we're in and the reason I'm saying this and why I'm saying it's about hysteria, but controlled let's say, controlled hysteria, the reason I'm saying this, I have a feeling that most people around here have absolutely no grasp of the emissions data. Now, Nigel's already talked about S-curves, these curves in the scenarios in the Inter-Governmental Panel on Climate Change, they had a big wide range of curves of what the emissions might do in the future. These were scenarios put together in the early 90s. Now they covered what we thought was the full extreme range of what could possibly be the case and I hazard a guess, I could be wrong, that there were many people at the time who said we'd never be at the top end of those curves and they could never be that bad. We're not at the top end, we're well above and accelerating away from the worst side of the scenarios that we estimated for emissions in the 1990s so let's get the emissions data understood.

The next thing is, I disagree both with Michael on this, about the temperatures of the last few years and the relevance of climate change terms so you can talk about it if you want, it has nothing to do with the science. Similarly Michael's claim that these particular events have something to do with the consequence of climate change, we cannot say that and we'll never be able to say that. So those are both scientifically irresponsible things to be saying in my view. When we come to the emissions data we have to recognise what's actually happening. We are rocketing out of control with emissions, there are no policies put in place to drive these emissions down, these emissions are global, they are significant, even in China and India but 23% of emissions are China are related to exports they make to the OECD countries, so we can't separate these things out, no doubt this microphone came from China and the emissions associated with that are not just the Chinese, they're ours as well.

So, coming back to the idea of the politician, if a politician is going to be elected, I don't know what manifesto they're going to be elected on here because it is not about easy choices, it is not about, as Jackie keeps saying, technologies. Technologies are important, particularly important are the supply technologies for the non-OECD countries, for China, for India, for places that are building up their infrastructure, low carbon technologies are hugely important. For the OECD countries, for us here, what's important for us is behavioural change and we're not allowed to mention that. Al Gore never mentioned that in his film. We'll find some way of actually living with new technologies, actually it's too late for that. The OECD countries have to make radical changes to our behaviour and the reason for that is because Michael again was wrong when he talked about a 60 or 80% target for 2050. These have nothing to do with climate change. What matters about climate change particularly are the emissions in the next 5-10 years and the reason for that is that CO2 remains in the atmosphere for 100-200 years, so each day where we have very high levels of emissions now are going higher each day, those emissions will be there, the emissions from these lights will be there likely in 200 years time from now, so it's not about 2050, it's about now to about 2015 to 2020. So it's radical, hysterical, controlled action is what we need now if we're going to deal with this issue, or carry on with this spurious view of the pseudo science, as far as I can see it's astrology, it's not actually science.

Sir Michael Lyons: Now I'm going to resist the temptation to suggest we turn the lights off and spend the rest of the proceedings in the dark, but what I am going to do and I know this is only half way through our discussion and I'm not asking you to make up your mind on the whole debate, but I do just want to test your opinion on that question of whether you would be willing as electors to sacrifice economic growth for more urgent action if you thought it was appropriate on climate change.

Well, I'm going to leave the niceties to one side, how many of you would vote for less economic growth if you felt that that would give …….

Member of audience

That's not a fair question.

Sir Michael Lyons: Why would it not be a fair question I'm going to insist on this because I do want to get your opinion. I'll just keep on reformulating the question until we have a consensus on this, so it will be much quicker if you leave it with such imperfections as I've introduced. What I'm asking those who would give priority to economic growth to put your hands up now.

Panel member

Is that for the UK or for the globe?

Sir Michael Lyons: For the UK. We're electing UK politicians. OK. Those of you who would give priority to protection of the environment, well there we are, we've clearly drawn this body from an interesting set of thoughts but let's move on because we've got much more to explore and the next question takes me to the role of business and it comes from **John Banyard**.

"Business leaders have urged government to act more decisively on climate change. Are they being hypocritical and shirking their own responsibilities"?

Jacqueline McGlade

You know, climate change makes good business change if you decide to do something about it. I keep hearing this from good business leaders because what does it mean? It means you'll use your resources more wisely, you'll use less energy, you'll think about the way you get your workforce to and from work and every single argument in the book adds up but what you need is a bit of co-operation from government to help you achieve that. I say that genuinely, I do a lot of work with business leaders now and when they are and they take the time and I hope you will take the time.

You're obviously a very intelligent audience because you're already stayed awake for a long time listening to this debate. I think you should inform yourself of the facts if you don't

already have them at your fingertips because I hope that this debate will make you one of those bar room bores who will sit there and answer questions about climate change because it fundamentally matters.

I think Kevin's right, it's about our consumption, so whether you're a business man, business woman, a leader in business in the commercial world or you're actually somebody who consumes, we are in the same business of how we produce things, how we consume things and how we deal with waste.

So it just makes good business sense to deal with the problem from the very beginning which is, if we use less energy, if we think about what we're doing in a much more constructive way, if we don't have a just in time economy which creates all kinds of problems about getting things in a truck at the last minute to do all these various activities in factories, if we really do try and bring innovation in and stop, for example, in the car industry the intermediate procedures that say, well, you know, we've got a workforce that only knows how to spot weld so we're going to stick with steel whereas we've got a car that could be made ten times lighter by using other materials. We have to help workforces obviously move forward but at the same time I think business leaders do need back up from government to create the right kind of environment where they can make these shift changes, so I think it's an equal responsibility but I do see an appetite for it and as I say, bottom line is it makes good business sense.

Julian Morris

I like the idea Jacqueline that we should move away from a just in time production economy so you're presumably advocating then the move back towards warehousing of stocks and all of the costs entailed in creating things which won't get used and keeping things warm when they're cold and all of the costs associated with it and is this a new dictate How bizarre.

Jacqueline McGlade

How is it that Sweden can change its whole production line away from a just in time economy and actually talk about local production?

Julian Morris

Sweden has moved mostly to a services economy, as we have as well, but let's not get too bogged down in this.

To answer the question, why do business leaders say that politicians should act more decisively and it was a carefully worded point, more decisively on climate change, because business really demands or wants at least, certainty.

Now, as we've seen in the past few weeks, business doesn't have certainty, but in order to operate in the most profit making way possible, businesses would like certainty. Some of those businesses will certainly benefit from regulations. In the recent emission trading programme in the European Union, Exxon, Shell and BP were amongst the biggest earners from trading permits. They earned hundreds of millions of dollars a piece from trading permits. Meanwhile the NHS and lots of smaller businesses which had higher costs of reduction of carbon dioxide had to buy permits at huge costs because these trades were zero sum trades, the carbon trading programme is a zero sum gain, some people made money and others lost money. This was not an entrepreneurial activity that led to benefits all round, this was a zero sum transaction between rich big companies who made lots of money and smaller companies in the public sector that lost money. If that's the approach which they're advocating then I think it's disgusting and I'm against it.

Lord Lawson

Jacqueline McGlade is delightful because she just believes whatever she wants to believe must be the truth. The fact is….

Jacqueline McGlade

You have said so many things that are outrageous tonight.

Sir Michael Lyons: I'm very keen to move this onto another question.

Lord Lawson

There are two quick things I must say. She says that this is costless. There's no cost. Every single environment economist who's looked at it anywhere in the world knows that to cut back on emissions would be considerably and seriously costly. There is a cost.

The other thing is that what Julian said is absolutely right. Of course business leaders say they want decisive action because they want two things. They like subsidies and putting their hands in the taxpayer's pocket, they always like doing that, it doesn't mean to say we have to indulge them. The other thing is that of course they are always afraid of competition from new entrants, newcomers and so on and the more you have a government organised subsidy economy then the more the big boys will benefit at the expense of the new entrants and the smaller boys. So no wonder they're saying that.

Michael Meacher

I must say, it is extraordinary the degree to which Nigel fails to see what is absolutely staring him in the face.

The fact is, in both the United States and in the UK we have a business community which is far more radical than its government and it doesn't take that attitude because of [. . .] reasons, of course he's right that they're concerned about economic gain, because they can see, as he can't, the way the world is going. It is absolute clear that we are moving towards a non-fossil fuel renewal energy economy and those countries, those business communities which get in on that first, including let me say, carbon storage for Chinese power stations, coal fired power stations, are going to make an enormous profit.

If I may say Mr Chairman, I'm beginning to disagree with everyone, including you. It is a false dichotomy to say, are you in favour of economic growth or are you in favour of tackling climate change . . .

Sir Michael Lyons: I'm duly reprimanded. Of course you are absolutely right, I should have given more thought to that question.

Right let me move us on, because I want to get now into a sense of locality and I've got a question from **Harriet Martin** and on this occasion, literally, I just want a two sentence answer from each member of the panel. I know that will be difficult for you.

> **"How does the panel think the people of Birmingham can be persuaded to embrace the changes necessary for life in a zero carbon city"?**

Kevin Anderson

Embrace the changes, broadly I think the best way of setting your mind in the right frame for that is to, if you have children, is to look at your children, if you have other relatives that are young, look at them and to think what you're leaving them behind. Maybe Nigel Lawson's right, maybe David's right, but is it worth the risk I don't think it is worth taking that risk with our kids so do something about it ourselves and hopefully our leaders will follow our example.

Sir Michael Lyons: David, any advice for Birmingham?

David Henderson

My advice would be that, it's up to each person to decide for himself or herself what kind of action to take and I don't think it's especially, of course it isn't especially a Birmingham problem. I would say that I don't like the question because I don't think it's established that so drastic changes are necessary and I think that for that to be investigated more objectively than

it now is, a lot of changes are needed in the whole process by which governments are advised. It's much too credulous and not objective enough.

Sir Michael Lyons: Thank you. Just for the record, I didn't write the questions and neither did the BBC. Jacqueline McGlade.

Jacqueline McGlade

I think that we should Birmingham citizens should get themselves properly informed, make wise choices, do a bit of choice editing every time they go out to buy something and in the end I think demand a third Industrial Revolution.

Julian Morris

The question was how about how one could prepare. I think that first of all, you'd want to make an enormous amount of money because the only people who can afford to live in a zero carbon way are very very wealthy people. If you're living on an average income, being zero carbon is, because bear in mind that you actually have to absorb some carbon, of course, I'm producing carbon dioxide now. So you actually have to be sucking carbon dioxide out of the atmosphere in order to be zero carbon and that's going to be pretty damn costly and frankly, the benefits to yourself are going to be kind of small and the benefits to the planet are zero for any individual and for the whole of Birmingham, even if the whole of Birmingham went zero carbon the impact in 100 years time of going zero carbon from now until 2108 would be unobservable. Even if the UK went zero carbon for 100 years it would have very little impact on the world so I think it's a bit of an absurd idea frankly.

Sir Michael Lyons: Thank you. I'm going to move onto the next question and just give our two ex-ministers a change to comment.

What does the panel say to the idea that over-population of the planet is the fundamental cause behind global warming and that it's just political correctness that stops us saying so Should we be encouraging everyone to reduce their baby emissions?

Michael Meacher

Well I have four children so I am guilty. I think we're absolutely right to raise this as an issue. It is one of the taboo subjects and it is very very serious.

Homosapiens, which is us, took, depending on where you think we became homosapiens, about 150-200,000 years to reach 1 billion population in about 1800. We then took 150 years to reach 2 billion. We then took 14 years to reach 3 billion. We took another 14 years to reach 4 billion. We took 13 years to reach 5 billion and 12 years to reach 6 billion. We're now at about 6¾ billion.

You don't have to be a rocket scientist to know that that is utterly and totally unsustainable and the combination of resource or lack of resource availability, particularly oil, which will gradually begin to run out in 30, 40, 50 years time, plus even more seriously, water. There are already areas of the world which are water stressed, probably a fifth of the world where people do not have enough water for washing, for cleaning, for hygiene and the UN expects that that number could double or triple over the next 20, 25 years. It is completely unsustainable and climate change is making it all the worse, reducing the world's water supply, reducing the world's food supply and using up this enormous bountiful availability of resources. All of this is now being concentrated in a relatively short period of time but we should not neglect that it is indeed the demands of us human beings, all of us and of course in the developing world they want the same standard of living as we have and they have every right to that which of course is a reason why we have got to reduce our carbon emissions more than otherwise in order to enable them to develop. Overall, the combination of those factors is completely unsupportable and all of them, not just one of them, not just population, but all of them need to be urgently

tackled, but that certainly includes world population. It's a very difficult, prickly, sensitive subject but it has to be tackled.

Sir Michael Lyons: Rather more than two sentences there I think. Nigel, can you be succinct?

Lord Lawson

I'll try and be as succinct as Michael was. He is of course an all purpose doomster, everything is doom, doom, doom and obviously some people are inclined that way. He's not the first.

We've heard this for 250 years or so since Malthus said that there's no way in which the agriculture could feed the growing population and very soon we'd all have war, destitution and there was every disaster which people are now talking about in the context of climate change and various other people have predicted this. Right recently Paul Ehrlich said that there would be millions extra starving by 1980 I think. This goes on and on, in America along, that's right. There's a market for these doomsters but we are onto something which is a little bit more realistic than the complete non-problem of global warming.

We are on onto something serious with population and something even more serious with water. Nothing to do with global warming or climate change but the population I think, the solution to that will be found because it's largely the question of whether the people can be fed and so far we've done very well, living standards have been rising, living standards as I say even by Nicholas Stern had predicted to go on rising hugely over the next hundred years. The fact is that with the agricultural revolution, with the revolution of bio-technology and genetic modification, the capacity to feed a hugely increased population is very much greater than it has ever been. We need to watch this, I am not prepared to do what the Chinese have done.

The Chinese say we've already made our contribution incidentally on the carbon dioxide front, because we have got this rigorous one child per family policy which is rigorously and ruthlessly enforced and leads to the most terrible family tragedies and our population as a result is declining and just think of what would happen to emissions if we hadn't done that, they're already the biggest emitter. Well if Michael wants to go along that road he's welcome to advocate it but I don't like that kind of population control policy.

In water there's actually I think a rather bigger problem because the agricultural revolution that I spoke about is not going to help if there isn't enough water, but there is fortunately huge technological progress going on in desalination and I think there is a reasonable chance that technology will solve this problem, but clearly it is something that we have to watch very carefully. Clearly also it has nothing whatever to do with global warming or carbon dioxide emissions.

Sir Michael Lyons: We're running towards the end of the evening. I'm just going to try and get two questions in. One is one of many questions that we had about different particular initiatives that might make a difference and its from **Chris Crean**.

Is nuclear power the silver bullet with respect to climate change?

Kevin Anderson

Again this is an issue of OECD and non-OECD, it's a very simplified version of this.

If you're in the OECD countries, nuclear power, I mean, if you can imagine the UK, could we have three power stations by 2020, could we have five power stations If we were talking about having forty nuclear power stations, I'm not for or against nuclear power, if we're talking about forty nuclear power stations by 2020 they might start to have some impact on CO2 emissions from the UK but we're not talking about that sort of number in that sort of timeframe. So for most of the OECD countries, nuclear is a red herring.

Most of you may know this, at the moment, nuclear power represents about 3.3% of UK final energy consumption, so of what you consume, nuclear power and energy is only 3.3%. Now for the non-OECD countries, who are building their energy infrastructure like there's no tomorrow as some people have made reference to already, for those countries nuclear power is an option to be considered. Now I'm not saying whether I think that's a good idea or a bad idea, but I'm saying that nuclear power is without doubt a low carbon, not zero carbon, it is a low carbon option. It has a whole host of other sustainability issues which you may or may not want to concern yourself with and there are some significant economic implications associated with nuclear power because they're very expensive to build. They're cheap to run, expensive to build and very expensive to de-commission. We don't care about that because that's in the future and that's our kids and we don't really give a damn about their future it appears. So nuclear power for the non-OECD countries is a player but it's a red herring for the OECD countries.

David Henderson

I think that if policies are adopted to reduce emissions in a serious way then nuclear power will certainly become more competitive in OECD countries as well as developing countries and there will be stronger pressure to deal with the problems it already poses and to deal with the problems of de-commissioning and storage which I think are manageable so I would say, the more concerned you are about the environmental aspects of climate change, the more you should be prepared to look at nuclear power as an alternative other form of power generation including coal and the more concerned you should be about exaggerated statements of the case against it.

Kevin Andersen

Could I just argue there, it would be interesting though, from David, have you actually done the maths on that, related to the cumulative emissions of carbon dioxide emissions for having a higher penetration of nuclear power stations, even for the UK, let alone say the EU. I'd like to see your numbers on that please.

David Henderson

Between us, yes?

Sir Michael Lyons: Can I then thank you for that and move us on to the very last question of the evening which I am going to give each of the panelist a chance to give a very brief answer. We are actually right up against the clock, this was anticipated earlier in the evening, the last question comes from **Ian Byatt**.

Should Birmingham now apologise for the Industrial Revolution?

Julian, that looks as if it's crafted for you.

Julian Morris

The benefits of the Industrial Revolution both to Birmingham and to the world have been absolutely enormous. We wouldn't be here today obviously but for the Industrial Revolution but much more than that, we wouldn't live the kinds of lives we live today, life expectancy wouldn't have risen from 40 to 80 but for the Industrial Revolution, so I think that Birmingham should be enormously proud of its industrial history and should be looking forward to a wonderful future as a result of that history and absolutely there is no way that you should be thinking about the Industrial Revolution as a bad thing, it's just a bizarre concept.

I mean, a little caveat. There were people who lost out as a result of the Industrial Revolution and if you're interested in my academic work, I've done some studies looking at some of the people who suffered as a result of the Industrial Revolution and this was as a result of unjustified government action allowing industry to take place in places where it shouldn't have done and without compensating the losers. With that caveat aside, the Industrial Revolution was a great thing.

Jacqueline McGlade

No of course it shouldn't apologise but what it should do is seize the opportunity for the third Industrial Revolution.

Unlike my neighbour, I have actual figures from actual governments that tell me that we are going to meet our Kyoto targets but I think there's so much more that Birmingham can do and I think that you have a workforce, you have a passion and there are other places and there are other places that will do it if Birmingham doesn't, so why not?

Lord Lawson

Europe, this is an important one, Europe is not going to meet its Kyoto targets and what is more, the only reason it's going to get reasonably near but it's not going to meet them, is because it's been outsourcing emissions to China and India, the developing world, very good.

When you have a global agreement you can't outsource your emissions to Mars and there is no way that that is actually practical so Kyoto points in the opposite direction. As for the Industrial Revolution as I mentioned earlier, that is the logical consequence of Michael Meacher's alarm and despondency and his attack on what we did in this country and what we did in Europe in having a carbon based economy, so I think Michael might want to apologise. I think the people of Birmingham are far too sensible to do so and for the same reason, the Chinese have wanted to follow along the same path and the Indians want to follow the same path, they think it's their turn to do so and they're going to do so.

Sir Michael Lyons: Michael, do you want to?

Michael Meacher

Yes, I'm not going to ask Nigel to apologise because I know he never will to anything, but I absolutely think so far from apologising, I think Birmingham should take pride in its role in the first Industrial Revolution and like Jacqueline, I think the role of Birmingham is to lead the way towards another and better Revolution which is coming. I believe nothing remains the same for very long in this world and what is needed is a new vision about an alternative better world based on renewables, on energy efficiency, on green technology and I think Birmingham has got all the skills to lead it.

David Henderson

I'm very pro the Industrial Revolution and what's gone after it. When I was just beginning my career which has now entered well into its seventh decade, we were looking ahead at future prospects for the world and not one of us imagined the extent of the progress which has taken place since the end of the Second World War, not only in the countries which are already advanced, but also and this far exceeded anyone's expectations or even dreams, increasingly, in countries which then were poor and which no-one was confident would not stay poor. That progress has not just been in material standards and consumption, but in length of life, in education, in leisure, in almost everything that makes life worth living and I would hesitate very much before committing myself now to proposals to put that under threat even if the promise of that was rescuing the planet.

Kevin Anderson

No I wouldn't apologise for the Industrial Revolution but as a mechanical engineer who likes nucon bean engines and likes internal combustion engines I find it hard to apologise for it. The Industrial Revolution gave us many benefits, again all benefits are boundaried. I think it did give us many benefits but in industrialised nations and the UK being a good example of this, essentially welfare from most studies that are out there, welfare effectively flatlined from the 1950s onwards so let's break with the Lawsonian dogma on this. Let's say that the Industrial Revolution had its place and it performed wonderfully for quite a long period of time, though many people suffered in the run through the Industrial Revolution, but overall we all benefited

very significantly from the Industrial Revolution, but that has not led to a lot of additional welfare throughout the 1950s, 1960s onwards so perhaps we need a new model.

I'm going to disagree with Michael now, I do not want Michael's new model. Michael's new model is just the old model but with green technologies. Now, I'm an engineer, I like my technologies, but the idea we're going to swap just to hydrogen and fuel sales and all this whizz bang technology which I would be only too happy to work on if he was prepared to give me some money, but what matters is the new Revolution is about behaviour, it's about value, it's about policy, it's about other things that let us build on the benefits of the Industrial Revolution. The old model had its day, we need a new model now and it's not just about green technology.

To finish off on the Kyoto issue, to disagree with everyone on the panel which I like to do, I disagree with Jacqueline and I disagree with Nigel. We meet the Kyoto targets in the UK, we'll only meet them because Maggie and Arthur didn't get on so we swapped to gas away from coal but that was purely fortuitous, nothing to do with climate change and because we outsourced a lot of our emissions elsewhere. However, Nigel's completely wrong, it's irrelevant whether we meet the Kyoto targets or not, because they weren't about climate change, they were about the mechanism. Is the mechanism sufficiently robust for us now to ratchet it up so it can start to bring about meaningful changes so I disagree with almost everyone on the panel.

Sir Michael Lyons: Well there you are. There seemed to be some agreement at times but it always escaped us.

I'm afraid we have come to the end of our time tonight. I think it has been an absolutely fascinating debate, although it will inevitably continue well beyond our efforts tonight and indeed that's one of The Lunar Society's purposes, to stimulate debate in this city and beyond.

Before we all go, I'd like to thank all of the panelists for the energy, sometimes excessive energy, that they've brought to our questions and all of you for the questions that you posed. There were many more than we could use and I can only apologise for the fact that we couldn't bring you more fully into the debate.

So, perhaps a round of applause as thanks for the panel.

Once again, can I ask as normal on these occasions, thanks and our appreciations for each of this evening's sponsors, Martineau, Anglian Water, Birmingham City Council, Birmingham International Airport and Midland Heart. Can I also thank The Lunar Society and particularly those individuals, both within The Lunar Society and the Town Hall staff for organising this event so professionally.

For those of you who are not members of The Lunar Society, I hope this event has wetted your appetite. The Society has a unique place in this city in encouraging creative thinking and active debate about the big issues of the day. If you want to know more about membership, The Society has a desk outside with more information and indeed there is a book stall with a number of contributions from some of our distinguished panelists, so you can take those away to explore for yourself the quality of the science that underlies their views.

Finally, can I thank you most of all for attending and participating in The Lunar Society's Town Hall debate. Thank you and good night.