

Speech Topic: Update Paper 5: The Science of Climate Change

Compere:

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Speakers: Ross Garnaut

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Transcript:

ROSS GARNAUT:

Good morning everyone. Thanks for those of you who are here with us in Hobart and thanks around Australia for those who have dialled in.

Today I will be releasing the update paper related to the work on science that was presented in the review a few years ago.

It's nice to be in Hobart for this presentation. It happens to be the home of a lot of the internationally important science that Australia does on climate change, with some of the world's most important work on sea level rise and a range of other ocean issues, in particular; some of it related to the work on Antarctica.

It's also good to be in Tasmania. Because while all Australians will be beneficiaries of successful efforts to reduce the impact of climate change, Tasmanians will be very large beneficiaries of effective efforts at the mitigation stage. Tasmania is very well placed to do well out of climate change mitigation.

In the paper that will be released this afternoon, this evening, on the science of climate change, I note that observations and research outcomes since 2008 have confirmed and strengthened the position that the mainstream science then held with a high level of certainty, that the Earth is warming and that human emissions of greenhouse gases are the primary cause.

By mainstream science, I mean the overwhelming weight of authoritative opinion in the relevant disciplines as expressed in peer reviewed publications. And in the paper I talk quite a lot about the sources of authority in the science and why I think we're able to make a firm judgement about the overwhelming weight of authoritative scientific opinion.

The statistically significant warming trend has been confirmed by observations over recent years. Global temperatures continue to rise around the midpoints of the range of the projections of the intergovernmental panel on climate change and the presence of a warming trend has been confirmed.

They've redone the statistical work that we presented in the original review that demonstrates very clearly that you can't explain what's happened to temperatures in the early twenty-first century, unless there is an underlying warming trend.

The rate of sea level rise has accelerated and is tracking above the range

suggested by the IPCC, and rates have changed in most observable responses of the physical and biological environment to global warming lie at or above expectations from the mainstream science.

It is an awful reality that no major developments in the science hold out realistic hope that for judgements of the 2008 review erred in the direction of overestimating the risks of climate change. I wish that were not so.

The judgement of the review, the greater risks of severe consequences under a scenario of 550 parts per million concentrations of greenhouse gases make the extra mitigation cost to achieve 450 parts per million outcome worthwhile, has been confirmed.

There was increasing discussion in the legitimate scientific literature of the possibility that large damage will occur at smaller increases in global average temperature than the IPCC focus and United Nations agreement on holding temperature increases to two degrees or less above pre-industrial level.

There is a case in managing the risks of climate change for seeking to reduce emissions concentrations below 450 parts per million carbon dioxide equivalent, but that would first require a credible program to get to 450 parts per million.

So I'm suggesting, in the paper, that while our risk analysis does alert us to the possibility of 450 parts per million still having consequences that we may wish to avoid, we should focus on making sure we get to that first objective and then once we're on a path to that, we can talk about whether something stronger is better. To focus on stronger objectives immediately would be to make the best the enemy of the good.

The scientific community has given greater attention to the emissions budget approach that was introduced in the 2008 review to the global and national task of reducing emissions.

This approach warns us that we are rapidly utilising the atmosphere's remaining capacity to absorb greenhouse gases without high risks of dangerous climate change and warns us that we now face the challenge of observing more carbon dioxide from the atmosphere than we are adding from human activity. The immediate implication is that avoiding high risks will require large changes in trajectories at an early date.

I conclude the paper with a few remarks about publication lags and scientific reticence. That I discuss the possibility that the way all of the outcomes are turning out to be at or worse than the central points from the mainstream science suggests that maybe there is a consistent reticence in the science, which means that the risks are that the continued evolution of the science will be consistently in the direction of worse outcomes.

But I suggest that, be that as it may, we still should focus on the outcome suggested by the mainstream science in the peer reviewed literature, take

our decisions on that basis and adjust to new knowledge if and when the mainstream changes its emphasis.

I'm very happy to answer questions from people around the table here in Hobart or on the telephone.

Who'd like to start?

PETER BOYER; Peter Boyer from - well I do a column in *The Mercury* in Hobart.

I was intrigued by a couple of things you said. But, first of all, you mentioned - this is a parochial question, some mitigation benefits for Tasmania.

ROSS GARNAUT: Yeah.

PETER BOYER; What might they be?

ROSS GARNAUT: Well Tasmania, uniquely in Australia draws its power, its energy, at the moment mainly from renewable sources.

So if the Australian price of electricity goes up, as a result of carbon pricing and people are compensated with tax cuts or in some other ways for that, then people in Tasmania will find themselves compensated like other Australians for the price increase, that the Tasmanian Government will get a nice bonus in the increased profitability of Tas Hydro.

PETER BOYER; Great. Okay. One other question about the science. It's fairly obvious to those of us who read newspapers and watch television that there is a public perception about the science of climate change that seems to have headed in the reverse direction from where you seem to have headed, over the past three years, since your review. That is you've - for you the science has been confirmed, for many others it's become a more doubtful proposition. Do you have any sense of how that could have happened?

ROSS GARNAUT:

First, it's not a universal phenomenon and I do discuss this briefly in the paper. But it is a - I think it's true in Australia, although we don't have enough observations in reliable polls asking the same questions to statistically tie down the significance of that, but there does seem to have been some tendency in that direction. It seems to have also been the case in the United States and in some European countries.

It's gone the other way in India, in the Middle East and some other countries in which the Pew Institute in the United States has done polling.

But it's an important question why it seems that in Australia and the United States and some European countries, confidence in the science has diminished. I can't hold out myself as a particular authority on this. I suppose the people whose job it is to interpret public opinion can do a better job.

But one must presume that as an issue moves from something of purely scientific interest into the subject of political debate and dispute, there is a whole lot of communications come into play that aren't actually about the science. That will affect people's perception of the science. So I imagine that that is one of the factors.

REPORTER:

How did you feel having a say...

REPORTER:

[Interrupts] Would you say that - you make reference in the paper often to sort of peer reviewed science and mainstream science and those sorts of things. Do you think that people get given kind of equivalent air play or equivalent credence who don't fall into that category?

ROSS GARNAUT:

Oh yes. In fact if you take our mainstream media and it will often seek to provide some balance between people who base their views on the mainstream science and people who don't. That is a very strange sort of balance.

It is a balance of numbers of words and not a balance of scientific authority and I think that has been a factor in the question that - in the answer to the question that Peter asked.

REPORTER:

You talked about the awful reality that the science has basically gone on its - the trajectory it started and in some cases above. Can you just repeat that for me?

ROSS GARNAUT:

Yes. If you go through the measurable implications of what the science was saying, if you look at particular predictions and say we take as the integration of the mainstream science of the day the report of the IPCC back in 2007, the latest general assessment report, if you take what they said about temperature increases, we are tracking more or less in line with that.

If you take sea level rise, they gave a range where we look as if we are way on top of that range. If you look at a number of physical and biological phenomena that they have made predictions about, in all cases we're tracking along with the centres of those ranges or above it.

So on the measurable phenomena then it does seem that certainly there has been no evidence of overstatement. It does seem to be quite a number of points of understatement. And I call that an awful reality because it would be much better if the opposite were true.

It would be much better if the evidence that we are showing that the earlier science had overstated things but that is not the reality.

SID MAHER;

Ross, Sid Maher here. I guess are you saying that - is the 550 parts per million no longer an option they have to go for 450 and maybe lower given what you have just said?

ROSS GARNAUT:

Oh well anything is an option, Sid. I have also mentioned that the way we are headed, we are headed towards 650, which on some calculations - it depends of course what happens next, but if there is not a big change in effort.

But there was a very big change in trajectory of emissions in the last couple of years; a favourable one. We are doing much better than we would have been under business as usual. But we are not doing anywhere enough to get us to, at this stage, to 450.

What I am saying is that the conclusion of the review, that it is in Australia's national interest, strongly in Australia's national interest for the world to succeed in holding emissions to 450 parts per million. That is much better than the world being moderately successful in mitigation and holding things to 550.

I note that there is some scientific authority saying 450 is not good enough, but I am saying, let's not be distracted by that at this stage. Let's focus on getting to 450 because in any case there is going to be over-shooting. So that a path to anything lower depends on us first having a credible path to getting to 450.

So really what I am saying is what my report recommended in terms of an objective of 450 being in Australia's national interest; an objective that was actually taken up and agreed in Cancun put in a different way with the two degrees' objective, that's in Australia's national interest. Let's make sure we do everything we can to get on that path and only when we're on that path is it worth thinking about anything more ambitious.

SID MAHER;

Will a carbon tax get us towards that?

ROSS GARNAUT:

I think that you need a mix of policies, but carbon pricing has to be the centre of it. We're talking here not about small adjustments over the next thirty or forty years. We're talking about large ones. To think of getting all the way to those large reductions in emissions through central planning, through regulatory decisions, deciding that this plant is too emissions-intensive and shouldn't be allowed to operate, that this set of emissions can be avoided cheaply – I don't think that humans have ever made a success of regulatory intervention of central planning on that sort of scale.

So certainly a carbon price is a central part of any policy that has a reasonable chance of getting us to the large reductions of emissions that are going to be necessary in Australia's national interest.

MARCUS PRIEST: Ross, Marcus Priest. Just following up on Sid's question. Is it the case that on the basis of your update you believe there is less justification for a target of 550?

ROSS GARNAUT: Yes, well my report said the target should be 450, Marcus. The...

MARCUS PRIEST: If a target of 550 was to be adopted...

ROSS GARNAUT: Yes.

MARCUS PRIEST: ...would you believe that is setting Australia up for quite severe consequences in terms of climate change consequences?

ROSS GARNAUT: That's right, severe consequences and consequences that are more costly than it would cost for Australia to play its proportionate part in avoiding them.

PETER BOYER: Ross, just a couple of technical clarification. You mentioned we can't explain the warming without an underlying warming trend. I presume you meant greenhouse warming trend there?

ROSS GARNAUT: Well there are two separate issues, Peter. One is, is there a warming trend? And that particular bit of econometric analysis, using the sorts of time series statistics that are bread and butter to some economists, that exercise is about whether there is a warming trend.

PETER BOYER: Okay.

ROSS GARNAUT: And there is a definite warming trend. There is a separate question, what is the attribution of the warming trend. There is a separate - that's for the science not the econometricians, not the statisticians.

PETER BOYER: Right.

ROSS GARNAUT: But separately I am presenting evidence in this paper that the evidence of human attribution is even stronger than it was three years ago.

PETER BOYER: Yes and one more. Now your 550 and 450 are of course carbon dioxide equivalent...

ROSS GARNAUT: That's right.

PETER BOYER: ...which incorporates all other greenhouse gases at an equivalent level, yes?

ROSS GARNAUT: Yes that's right.

REPORTER: You talked about sea level rise being higher than the range suggested. What will that mean? What will be the consequences?

ROSS GARNAUT: Oh yes, we are now sitting in the CSIRO building in Hobart. A lot of the world's path breaking work on Antarctica is done not far from here. And that work is showing that there are risks of - well risks pointing to something more probable than a risk - that sea level rise will be well above the levels, the range indicated in the IPCC report.

I present the results of quite a few studies. You will see from the update that the different studies have given different ranges. None of the ranges are lower than the IPCC. I don't want to put a number on it. Other people working on this in Hobart will - have contributed to that. But the range is - moves upwards from the IPCC numbers. The credible numbers go up to about 1.9 metres.

But let me stress, this area of science is an active one; a lot of work going on. The uncertain element is the rate of ice flow in west Antarctica and Greenland, not the melt so much as the flow of ice which then melts when it gets into the sea. There is a lot of work going on to try and get a handle on what will determine that rate. It's greater than the mainstream science thought a few years ago, but there's a range of views about how great it will be.

REPORTER: There was a paper out last Friday, in Nature, suggesting that the ice sheets were now taking over - in the process of taking over as the major source of sea level rise, which will be a big shift.

ROSS GARNAUT: Yeah, coming out last Friday, it was - I don't think we caught it, but that's consistent with the general story.

REPORTER: You talked about the ability to absorb greenhouse gases and that that's running out. Can you explain that?

ROSS GARNAUT: Yes and bear in mind, I don't pretend to be a climate scientist, I've just tried to understand what other people have been writing. But in the natural systems of this Earth, there are a number of sources of carbon dioxide, a number of ways in which carbon dioxide is absorbed into the oceans, into land. Now for a very long time and all of the time since a species like us has existed on Earth, there's been a reasonable balance between carbon dioxide going into the atmosphere from the earth and carbon dioxide being absorbed from the atmosphere and the oceans and the earth.

That imbalance started - that balance started to be disturbed with the acceleration of modern economic growth and industrial activity early in the nineteenth century. As an economist, I focus on 1820 as the point that modern economic growth spread from being an idiosyncratic phenomenon on a little island to the west of Europe into the European mainland. Since that time, there's been more carbon dioxide entering the atmosphere than the natural systems have been able to absorb.

I note in the paper that that rate of introduction of carbon dioxide into the atmosphere has been steadily accelerating, especially in the second half of the twentieth century and the first decade of the twenty-first century. This is the period of most rapid modern economic growth. And from the beginning of this new century, the most rapid period of global economic growth of all, with our growth spreading to the big developing countries with large populations. A wonderful thing from the point of view of human development, but some very challenging environmental consequences.

Now in the evidence is that over this half century about half of the emissions in the atmosphere have been absorbed, but there are some signs that the capacity to absorb those might not be quite keeping up, but I'm not making a very big point of that at this stage. Of course if you're only absorbing half, the concentrations of greenhouse gases in the atmosphere are steadily warming and that is the source of the human-induced warming.

ADAM MORTON; Adam Morton here. On the politics, was it a mistake for Labor to announce the framework of its plan without more detail and are you worried its failing in selling its proposal?

ROSS GARNAUT: On the first point, Adam, I'm not here to comment on the politics. You and your colleagues dialled in are the experts on that. On selling policies, this was always going to be a complex set of policies to sell. I think the

fundamentals that are driving us towards first a strong commitment to play our proportionate part in a global effort to reduce greenhouse gas emissions are compelling in Australia's national interest.

If we've got a big job to do there, we have to think about the most efficient way, the way at minimum cost to the Australian standard of living, a minimum cost to high income Australian jobs and doing that, I don't think there's - well there's no doubt in my mind that a carbon price has to be part of the suite of policies that get us to strong mitigation outcomes at reasonable cost.

And there's two risks with setting about a big emissions reduction task with inefficient policies. One risk is that it will cost more and do unnecessary damage to the Australian standard of living. The second risk is the cost will become so high that we will give up on the mitigation objective and then the costs of unmitigated climate change will be too high. And for Australia not to play its proportionate part in a global effort would be damaging to that global mitigation effort.

GILES PARKINSON;

Giles Parkinson here from Climate Spectator. You talked about the reticence of the scientists, particularly those who have more sort of gloomy outlooks. Can you explain a bit more about what you meant by that and what your concern was on this?

ROSS GARNAUT:

Yeah. We'll they're personal reflections. I include some personal reflections of my own. In any area of scholarly endeavour, if you find that your analysis is leading you to a position that's way outside the mainstream, you wonder if you should pull your punches a little bit. Well it's actually a subconscious process and I recount how I was the first economist to work through the implications of the new Chinese policies of 1978 for the global economy and global trade and for Australian opportunities.

I made a lot of speeches, wrote a lot of papers through the '80s, culminating in my 1989 report to the Prime Minister, Australia and the North East Asian Ascendency. And when I read those papers now, what strikes me is the understatement, the direction of change, the state - the shape of change is all there in the paper, but I understated it.

And yet I was out on a limb, going much further than anyone else anywhere was going and sometimes I wonder a little bit if the reason I was understated was I was already way ahead of the pack out on my own and that's an uncomfortable position to be.

So now I quote from the Edwin Reischauer autobiography. Edwin Reischauer was Kennedy's ambassador to Japan, professor of history at

Harvard in the post-war years. And when I read his autobiography, it reminded me of my own experience in the '80s. He was ahead of the pack in predicting very strong economic recovery and growth in Japan, found that he was always criticised for being too optimistic. But every time he revised his main book, he had to be more optimistic.

So he said finally the penny dropped that it's more scholarly to be pessimistic and wrong than optimistic and right. I give a quote from Hansen, the head of the NASA climate program, in which he says that scholarly reticence has led scientists who have come to conclusions about large risks of climate change to pull their punches a bit because if you're already ahead of the pack, you get all the kudos you can get from being the frontrunner, but you only get more criticism for getting further out in front.

And so he suggests that scholarly reticence has been a factor in the climate science not going - not following the full conclusions of their analysis. Now I'm not making a strong point of that, but I am commenting that there has been a consistent tendency since the beginning of the IPCC for each new report to have to have to be - to issue stronger warnings than the one before. The new science since the last report in 2007 suggests that the next report may be in that direction as well, and I'm just wondering if scientific reticence is part of the explanation.

I'm not suggesting we should act on that. I'm suggesting we act on the peer review mainstream science but just be alert to the possibility that we may be adjusting to more negative outcomes from the mainstream science in the future.

MATT JOHNSTON:

Matt Johnston from the *Herald Sun* here. You mentioned Black Saturday and heatwaves and those other events. Can you just flesh out how much global warming contributed to those events?

ROSS GARNAUT: Oh, you can never attribute any particular event only to global warming. What you can say is that a warmer world and a warmer Australia and warmer oceans around Australia, will increase the probability of extreme events of some kinds. The science says they'll increase the probability of - not of cyclones, but of intense cyclones. They'll increase the probability of flooding events and droughts and of extreme heatwaves which provide the background to greater fire vulnerability.

The temperature events that preceded Black Friday - Saturday, Black Friday was 1939 - were beyond anything in Australian recorded history. Now you can't say that if there was no general warming there would never be a day, or series of days, as hot as those in late-January or early-February. You can say that spells of weather like that become more probable the higher the general average level of temperature.

One has to also note that the general increase in temperature in Australia over the last century is only about 0.9 degrees so far on average, a small fraction of what we would expect with unmitigated climate change. So if you can already see the signs in increased probabilities, then with the higher temperatures in future, the vulnerabilities will be that much higher.

COMPERE: We've only got time for one more question, folks.

ANDREW TILLET: Professor, Andrew Tillet from *The West Australian* here. You mentioned - you touched on how the science is getting more compelling to taking action as public opinion swings the other way. What does Government need to do to reverse that tide in and to get the public back on side on supporting climate action?

ROSS GARNAUT: Well again, Andrew, others are experts in that. I don't advise the Government on that sort of thing. I've been asked to update my report on the costs and benefits of doing - of Australia playing a role in global mitigation and how we should go about that. That's what I'm focusing on. Other experts, like yourself, can you work out what should be done to change the politics.

COMPERE: Thanks everybody.

ROSS GARNAUT: Bye.

REPORTER: This 550 parts per million, is that an agreed to target?

ROSS GARNAUT: No, 450 is the agreed to.

REPORTER: That's, sorry, globally?

ROSS GARNAUT: Globally, yeah. And the Australian Government holds the view that in Australia's national interest for the world to get to 450 parts per million and for us to play our part in that.

But Kevin Rudd as Prime Minister announced that as an objective after my original report and that became an objective of the international community. It was part of the Copenhagen meeting and then it was confirmed and became actually agreed internationally at Cancun.

So in the form of a two degrees, which is roughly equivalent of 450 parts per million, a two degrees objective. It's now part of the international objective.

REPORTER: James Hansen, here, you mentioned, of course, is strongly arguing for a reduction well below that - perhaps back to 400, I think it is, 350 CO₂, 400 CO₂e - is pursuing such an argument - I guess that's putting him outside the reticence brigade, he's getting out in front of the pack - you would approve of that, I presume, coming from a scientist such as that? Not that you would necessarily support the practicalities, but...

ROSS GARNAUT: Yeah, but I am also saying that a non-scientist like me, he can take that position but a non-scientist like me has to wait until it's part of the received scientific wisdom. If your science is good enough then that will gradually influence the received scientific wisdom.

REPORTER: So just to confirm on this scholarly reticence, what you're saying is you think the scientific community should play in a way a more active role in shaping opinion one way or the other.

ROSS GARNAUT: No, what I'm actually saying, Peter, is let's be ready when they further revise their views in an unhappy direction. Don't be surprised.

REPORTER: Yeah.

ROSS GARNAUT: Let's make sure that the positions we adopt on policy are capable of being scaled.

REPORTER: So it's up to us in a way to interpret the data more carefully, yeah.

ROSS GARNAUT: Yeah. I'm not saying we should aim for what some people in the literature are saying, what Hansen's saying or some others, but the fact there has been this tendency of scholarly reticence should alert us to the possibility that it might get worse.

REPORTER: You mentioned, and you probably don't want to really go into too much, but a sea level rise of 1.9 metres. Over what time period?

ROSS GARNAUT: End of the twenty-first century. But you'll get a lot of detail on that in the paper, much better to go to that. All I'm doing is taking one of those - the top of one of those ranges. And I'm not saying that's what it will be. There're a lot of studies and they come out at different ranges.

COMPERE: We're going to have to finish it up there.

- ENDS -

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