Australian Government

AUSTRALIA'S CHIEF SCIENTIST
PROFESSOR IAN CHUBB

EMISSIONS REDUCTION SUMMIT DINNER

20-MINUTE KEYNOTE

8 PM

MONDAY, MAY 5

AFL DINING ROOM,

LEVEL 2

GREAT SOUTHERN STAND, MCG

Thank you for the opportunity to speak to you tonight.

I have done enough of these ‘during dinner speeches’ at the end of a long day to know that they shouldn’t be too heavy. So I will try to keep this one digestible.

But a serious topic like our climate doesn’t lend itself to too many jokes, nor is there much room for levity. So you won’t be rolling in the aisles either.

I won’t go chapter and verse through the detail of the science of climate change, and I won’t regale you with data.

I will, however, give you an outline of some of what I accept as strong evidence that there is global warming with an anthropogenic component; and I will make a couple of comments along the way about how we debate that evidence.

I do want to talk about the climate of the climate debate and end with a few words about leadership.

To begin.

I note that the Attorney General in his recently reported comments about free speech remarked that alternative views have a right to be heard and that to suppress them would be ‘medieval’ – by which I infer he meant that we in contemporary times are better than that.

And I think the first part at least is right – we should not suppress views. But views should be given the weight they warrant- and that weight should be based at least in part on the knowledge and expertise of the individual offering the view.

I particularly agree that genuine scientific evidence should be aired and be subject to the scrutiny of peers, wherever it may lead. And if the evidence is shown to be soundly based it will add to our knowledge and understanding and be used to adjust our conclusions. If it is not, it has no place in the argument. As I said, it should be given the weight that it warrants.

On the other hand, there are those who only offer opinion, but they often do so with a level of certainty that disguises that it is more likely: *a leap*

of faith. *An intuitive step outside the limitations of science-based argument* - as I saw it described elegantly in a spoof corporate video I saw recently. Belief trumping evidence, you might say.

A couple of weeks ago, I was told about one of those shows we now see often on TV. You know the ones – where journalists talk to other journalists all of whom have complete confidence in their ability to offer certitude on any topic.

During the course of this particular program I gather they discussed climate change. One of them, I am told, commented that they didn't need to kowtow to experts on the subject. Now I would be pretty sure that when their car breaks down none of them would take it to the fish monger to get it fixed – or even to get an opinion. So I suggest that what they really meant was that they didn't need to have particular regard for the overwhelming bulk of opinion because it is expert. After all, it would tell them what they clearly didn't want to know, so don't listen and it isn't there.

And we all know what follows: cherry pick and sow the seeds of doubt.

As a consequence, climate science experts have been labelled and disparaged. They have been represented as part of one giant conspiracy for ideological (i.e. destruction of the free enterprise system) or (personal) financial reasons.

There are accusations of fraud, that climate change is a 'delusion' or that the science is 'a religion'. There are calls for some scientists to be jailed; accusations of venality – where scientists say and do whatever it takes to get another research grant or another airfare to a conference where the group thinkers huddle, or that they are Nazis.

And this is all because there is no body of scientific knowledge that can refute what we now understand to be happening to our planet. And because some of the scientists express exasperation even irritation at what they see as a distortion of the science and the misuse or worse of scientific evidence. And because they are telling us what some people just don't want to hear.

Then there is 'group think', apparently a characteristic of the climate scientists.

It is an intellectually bankrupt argument bordering on the facile.

Have those who trot out the line ever stopped to think just how 'group think' might be arranged? How a few thousand scientists from all sorts of disciplines using all sorts of techniques and technologies and from all over the world could be coerced into a shared view (dare I say consensus) that human activity is having an impact on our climate?

In other words, regardless of what their observations show, it is suggested that the scientists will spin them or manipulate them so that they can rise as one and declare that human activity is one of the reasons why the planet is warming. Really?

Unlikely, so let's sow the seeds of doubt.

As big tobacco discussed in 1969[1] - *"Objective No. 1: To set aside in the minds of millions the false conviction that cigarette smoking causes lung cancer and other diseases; a conviction based on fanatical assumptions, fallacious rumors, unsupported claims and the unscientific statements and conjectures of publicity-seeking opportunists.* Even more florid than now maybe, but the direction is familiar.

The Attorney General might have been right in labelling suppression of alternative views as medieval. But if the passage of time is supposed to lead to enlightenment, let me just say that the notion of 'shooting the messenger' goes back further than medieval times, all the way back to ancient Greece in fact. Bring on enlightenment.

I know that by the very nature of science *not every single detail is ever totally settled or completely certain. Nor has every pertinent question yet been answered*.[2] But the evidence is mounting, it has been scrutinized as never before – and it leads inexorably towards a level of probability that the prudent would heed.

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[1] http://tobaccodocuments.org/landman/332506.html **Derived from:** /bw/332506.html snapshot_bw 0000332506

[2] *Climate Change Evidence & Causes: An overview from the Royal Society and the US National Academy of Sciences,2014*

I know that there are issues of legitimate and continuing debate: the sensitivity of the climate to increases in CO2, the role of the oceans in warming, the extent of warming into the future, the regional impacts of warming to name just a few. All need further work and the soundness of our knowledge will depend on the scientific method: observation, robust scrutiny, peer (or expert) review, skepticism and replication. We will learn more as we do more.

But there are now findings that I think can help us draw conclusions with a high degree of confidence:

At the outset, let me make clear that I accept that work on the 'climate' is riddled with complexity. There is more than one variable – and there are some over which we have no control. However, let me say:

- I accept that CO2 is a greenhouse gas – that means that it traps heat and keeps it in the lower atmosphere – simple physics.
- I also accept that the bulk of the atmosphere (Nitrogen and Oxygen) is 'invisible' to infrared radiation – so while there are those who point out that the **concentration** of CO2 is very low and therefore the effect will be marginal, it is the actual **amount** of CO2 in the atmosphere that is important. A point I'll come back to later.
- I know that over the last 800,000 years, the CO2 concentration measured using ice-cores varied between 170 and 300 ppm. This makes the present concentration of nearly 400ppm unprecedented over that period.
- During the period of the most rapid rise during the past 800,000 years, the CO2 concentration increased by approximately 90ppm over ~6000 years. The concentration has now increased 100ppm in less than 200 years, and the bulk of that in the last 45.
- I accept that changes in the amount and ratios of isotopes of carbon in the atmosphere all indicate that long-buried fossil fuels have been burned and contributed to the rise in CO2.
- I accept that the planet has warmed, with each of the last three decades warmer on average than any other since 1850; and each warmer than the one before – and that 13 of the 14 hottest years on record have occurred since the late 1990s.

- I accept that sea levels have risen by about 20cm on average over the past 100 years, that the oceans are becoming less alkaline (more acidic), that ice-sheets in Greenland and Antarctica are melting – and that while the temperature of the atmosphere could be in a 'pause' the ocean's heat content has continued to rise.
- I also accept that sea ice cover and thickness in the Arctic is diminishing, while in Antarctica sea ice has increased.
- I know that The US Department of Energy has calculated that human activity has caused some 1.3 trillion tonnes of CO2 to be released into the atmosphere from the burning of fossil fuels;
- And a review by researchers from the Woods Hole Centre[3] calculated that 0.7 trillion tonnes have been released into the atmosphere as a consequence of de-forestation;
- I know that roughly one half the emitted CO2 stays in the atmosphere with ¼ absorbed by each of the oceans (along with 90% of the heat) and the land.

In the light of this, I think that those who doubt that there is significant (or any) anthropogenic contribution to global warming need to answer a few fairly simple questions.

- Why would the addition of some 2 trillion tonnes of a greenhouse gas like CO2 into the atmosphere, to a level unprecedented in the past 800,000 years and at a rate some 30x faster than at any time (or ~120x faster if you look at just the past 50 years), have little **if any** effect on our planet?
- Is there genuinely science-based evidence that refutes the growing mountain of data that leads to the conclusion that it is highly likely that human activity has had an impact on global warming?
- Is there an explanation (beyond the facile: they're all flawed) that can explain how models that strip out the additional CO2 show that there would be virtually no warming if it were left to natural causes alone?

[3] Houghton, R. A. (2010) How well do we know the flux of CO2 from land-use change? Tellus B, 62(5), 337-351, http://onlinelibrary.wiley.com/doi/10.1111/j.1600-0889.2010.00473.x/pdf

No? So sow doubt.

Ask for ‘proof’, even though such a demand shows little understanding of how science works. For a start, what would be the controlled experiment? It would need our world plus a parallel planet the same as ours with all the variables except human beings?

Instead of waiting for the unachievable, scientists look for evidence from multiple sources, then check it, test it, debate it, replicate it and draw conclusions from it. And as the evidence accumulates, they may even notice some convergence – an anthropogenic influence on planetary warming, for example. And we could and should use all the information we accumulate to project ahead.

Instead of constructive discussions about how to get ever more evidence, or ever better models, we have the discussions about whether CO2 is a pollutant; or whether it is a poison; or accusations of group-think. And we are pressed to put the idiosyncratic alongside the expert, individual opinions against the weight of evidence and then to present them as equals, and to give them equal airtime or column inches.

As I said earlier, studies of the climate show just how complex the interactions of the various elements are – and the interpretation of their combined impact needs close and careful study, and modelling.

Modelling is critical. It points out directions like road signs on the freeway – they tell us the direction we are heading, and the distance, but they don’t presume to be accurate to the centimetre. It would be as irrational to ignore the road sign as it would be to ignore the climate models because they give us a range and not a single point.

I note that one Roy Spencer whom Mr Maurice Newman is fond of using to justify his views, was quoted in that great journal of record The Australian as saying *I’m not saying that it can be proved that there’s something seriously wrong with these models ... They might eventually be shown to be correct in another 30 years if global warming returns with a vengeance.*

So there you go. In a nutshell: we can’t show that they are wrong, and we can’t show that they are right, so let’s do nothing, just wait – and I presume hope.

How would we answer the grandchildren when they ask what did you do in the Great Climate Debate, Granddad? Say that we sat on our hands, but uncomfortably because our fingers were crossed?

We live with and use models all the time: from the economy, to interest rates, to the value of the dollar and insurance premiums and health, to name a few. We assess, evaluate and manage risk. And we take prudent steps on the basis of the information we have to hand and that the relevant models provide. So it must be with climate change – the consequences are too significant to ignore. The values and principles of business management bear much in common with climate change management. Both require rationality, evidence and risk analysis.

In a recent speech[4], Paul Polman, CEO of multinational Unilever, said: *"Left unchecked, climate change has the potential to become a significant barrier to our growth strategy, and that of just about every other company…It is only by tackling climate change in a systemic way that we can deliver growth for the global economy in the 21st century"*

Corporate managers and investors know that climate change is happening and is, or will, affect their business.

The question is, can this corporate responsibility be used with science to challenge civic indifference or the nay-sayers?

We need more CEOs to show leadership and not just act on climate change inside the company, but to take on the debate outside.

Thank you.

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