

## Climate Code Red

7 August 2008

Australia could move entirely to renewable energy systems and transform our economy in ten years. It's a bold idea but one that co-author of *Climate Code Red*, Philip Sutton, believes is doable and absolutely necessary. Alexandra de Blas is in conversation with Philip Sutton about how he thinks we can rescue our climate from its state of emergency...in a decade.

### Transcript

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**Robyn Williams:** Good evening Robyn Williams with In Conversation. Well did you see *Four Corners* on Monday evening, a disturbing report about the vanishing arctic ice? Here's a sample.

As we left the sea ice of the high arctic at the end of our journey we had as many questions as answers. No one can predict the future of this unique place but the great sea ice is disappearing faster than all predictions. It will change the climate irrevocably not only are we partly to blame but we are continuing to push the arctic towards its tipping point.

**Robyn Williams:** From Marian Wilkinson's report on *Four Corners* on ABC TV. So what to do? According to the book *Climate Code Red*, which has actually a forlorn looking polar bear on it's cover, there's plenty of action we can take. The book, by Philip Sutton and Melbourne business man David Spratt, is actually endorsed by the governor of Victoria Professor David de Kretser himself a scientist who launched the book at Parliament House. This evening we shall hear from Philip Sutton director of Green Innovations, you may have heard him on *Perspective* after *PM* on Tuesday giving an outline of his concerns. Now a more extended conversation with Alexandra de Blas on the evidence and the responses.

**Philip Sutton:** The most critical piece of evidence physically on the ground is the very rapid loss of ice from the Arctic which is now advancing so rapidly that it's looking very likely that in summer time the ice will be completely lost within five years, possibly even within three years.

**Alexandra de Blas:** Why is that such a problem?

**Philip Sutton:** Because the Arctic ice is highly reflective, it sends out 80/90% of the incoming solar radiation, if you then lose that ice the sea that is then exposed, the dark sea, is actually a very good absorber of energy and so it will actually capture a lot of solar energy and start to warm the Arctic dramatically, possibly causing a 5 degree warming locally which will then have significant knock on effects in two critical areas. One is on the permafrost which is the land area surrounding the Arctic Ocean which contains a vast amount of organic matter, old trees and vegetation of various

sorts. And as that melts it starts to breakdown and you get very large quantities of carbon dioxide or methane depending on whether the particular local environment is wet or dry. If it's wet you'll get methane which is a very potent greenhouse gas, if it's dry you will get carbon dioxide released directly into the atmosphere.

**Alexandra de Blas:** So if this positive feedback loop happens what are the flow on effects of that and what sort of temperature rise are we likely to see globally?

**Philip Sutton:** Our rough estimates are that the various knock on effects such as the permafrost and so on could result in a 2 degree warming flowing out of the level of heating that we currently have. In other words you need very little additional pressure from the industrial system, from the human economy to get a 2 degree warming or even slightly higher from the heating that we've already created.

**Alexandra de Blas:** When you say 2 degrees what exactly do you mean? Is that 2 degrees above pre-industrial levels?

**Philip Sutton:** Yes, it's 2 degrees above pre-industrial, we are already 1 degree approximately or 0.8 degrees above pre-industrial at the moment so that this additional heating would produce just a bit over 1 degree.

**Alexandra de Blas:** If we get up to 2 degrees in warming what sort of implications does that have around the world?

**Philip Sutton:** People are familiar now with the story about increased extreme weather events and we're having increasing difficulty getting crops to market etc. so that's feeding into our food crises that's emerging, even at this stage. It also feeds into desertification around the world so very large sections of arable land will be subject to drying and the paradox is that in some places it's not necessarily the case that the amount of rainfall will reduce, but that the air temperatures will be higher, the rain - when it comes, will tend to come in more intense bursts, more of it will run off and then the higher air temperatures will mean that the soil actually dries out more rapidly. So that the desertification or desert forming effect can occur while you even get increased total amount of rain in some areas.

**Alexandra de Blas:** Why do you think the melting of the sea ice and the knock on effects from that are catastrophic? Why is this an emergency, a climate code red?

**Philip Sutton:** Well the permafrost can release almost the equivalent amount of carbon dioxide as we've released from all the fossil fuels around the world. One of the next kind of systems to fall over which we think is close to on these tipping points is the Amazon forests, that's another vast area where there's a tremendous extent of forest and carbon in the soil as well. If the Amazon suffers from a drought that lasts for say 7 years in a row and they've had droughts up to 5 years so far, then that system can lose so many trees that it's not able to maintain the normal water flow from the Andes across the continent and that the Amazon itself, large slabs of it, can actually trip and change ecologically so they become dry grasslands. So you'd actually lose all the carbon stored in the vast Amazon rainforest apart from that also being a massive loss of natural species which would be terrible.

Everywhere you look you find that there are these critical tipping points. So another one which is being pushed over at the moment is the Himalayan glaciers. China, India, Bangladesh, Indo China, Pakistan - all very, very seriously depend on the water flow coming out of the Himalayas through the snow melt. At the moment we are heading to lose pretty well all the Himalayan ice within the next few decades so this is

affecting literally billions of people's livelihood and the ecological effects of course would be significant as well. So these are already underway, this is not something that we are talking about for some long distant future these are threats that are posed by the current climate situation.

**Alexandra de Blas:** Now the Greenland ice sheet, that's another one of these areas with a tipping point and that could have up to 7 metres in sea level rise. Where is that at?

**Philip Sutton:** Greenland at the moment has now got extensive areas of melting each summer, it's obviously melting rapidly around the edges but there's also extended melt that extends over the surface of 50% of the area of Greenland. A lot of the scientists I think now believe that if the current temperature, the current temperatures we're not talking about increases, but if the current temperature were to be maintained that Greenland would just slowly melt until there's a very small rump left. And I think people now feel that it has now actually entered that tipping point where it will be lost. The big question is how quickly will that occur and some years ago people thought that it might take 300 to 1000 years to fully melt, as we see the melting occurring people are discovering that it's a much more rapid process than they expected and so it's quite possible now that you could lose a very substantial part of the Greenland ice sheet in 100 or 200 years.

**Alexandra de Blas:** You're saying that we've only got ten years, why do you say ten years?

**Philip Sutton:** Well ten years is really more to do with the question of how fast we could be making the change. If you were to say well when did we past the safe level, we probably passed the safe level 20 years ago, possibly even 30 years ago. So there is no further ten safe years, we're actually in dangerous climate change now and it just simply goes from dangerous as it is now up to catastrophic over a period of time. Ten years is a period in which we could actually physically restructure the economy if we took the thing seriously as we need to.

So for example the level of threat that's implicit in climate change is at least equal, probably exceeds the threat that existed during the Second World War. During the Second World War 1939 to 1945 economies around the world were restructured dramatically to create a world safe from the military incursion, we are now facing a threat which is equal or worse and so we are saying with sufficient will and effort we probably could physically turn around the structure of the economy so it actually puts us on the path back to a safe climate.

**Alexandra de Blas:** What proportion of GDP would it take to actually turn an economy around, to create a safe climate?

**Philip Sutton:** Different people's estimates vary, I've heard people say for 5% or 10% of the economies turnover you could make that change. I'm not sure that that's necessarily enough because people are tending to look at what you are intending to do for the domestic economy and not taking account of the fact that the rich countries will probably have to play a major part in helping. If nothing else, helping with investments in the developing countries, China, India, Brazil etc. plus we've also got about 200 billion tons of excess carbon in the air already and we're going to have to draw that out and that's going to require big investments in the growth of vegetation of some variety because it's the best technique we have currently for sucking CO<sub>2</sub> out

of the air. That's a big job, it could be a 30 to 100 year job and could require a lot of investment.

**Alexandra de Blas:** Let's actually go back to looking at what is a safe level of climate change, what are the levels that are dangerous? At the moment we have 387 parts per million of carbon dioxide in the atmosphere. Now you're arguing that we have to bring that down to 320 parts per million, why do you think we have to bring it a lot further down than where it is today?

**Philip Sutton:** It's relatively simple which is that we think we can't have a safe climate without the Arctic sea ice in the summer time. The Arctic polar cap needs to be there. We then looked at when did it appear to be secure and that was at least as low as the temperature we had in 1980, we need to cool the planet by at least a third of a degree to be able to secure the Arctic sea ice.

**Alexandra de Blas:** It seems interesting that some people are talking about warming of 2 degrees or warming of 3 degrees because it's not possible to bring the temperature down but we wouldn't tolerate that level of risk when it comes to insurance, or building an aeroplane, or building a bridge. What's going on with the way we are looking at risk in terms of climate change?

**Philip Sutton:** I think we are terrified more by the complexity of solving the problem than we are terrified by the impacts of the problem. We are really mesmerised by just how difficult it would be to shift a whole economy and the world economy in order to protect ourselves. A lot of people have said well it's too hard therefore we'll just simply have to look elsewhere for targets for the environment. Forgetting that there are consequences of taking these higher targets and these consequences are actually worse than the efforts that we'd have to put in to solve the problem.

**Alexandra de Blas:** What do we have to do to bring the level of carbon in the atmosphere down?

**Philip Sutton:** If we hook it on to reducing the temperature, so the question would be how do we cool the earth, there's really three key components. The first one is that if we want to cool the earth then there's no point in adding further heating agents to the atmosphere we have to get the emissions down to zero. We also are likely to stay at about the temperature we are now if we simply stopped putting carbon dioxide out into the air and other greenhouse gases then the temperature would tend to stay roughly where it is now for several hundred years. Now that's too hot for too long so we obviously have to then take carbon dioxide out of the air itself and that is most easily done by growing vegetation. And then the next question is how long will it take to get the excess carbon dioxide out of the air because in terms of natural processes until you get the carbon dioxide levels down you can't really cool the planet properly and so that's where we've started to consider the serious prospect that as part of a total package of zero emissions and taking the CO<sub>2</sub> out of the air that you might also have to consider some level of direct cooling.

**Alexandra de Blas:** You're talking about fairly radical things there, are you talking about adding sulphur to the stratosphere?

**Philip Sutton:** I guess the answer is yes, we are certainly looking at it or we need to increase the reflectivity of the earth and one way to do that naturally is to increase the amount of cloud formation. And any white surface if you like ice or cloud will reflect a certain proportion of the incoming solar radiation back to space.

**Alexandra de Blas:** How long do you think it's going to take the world to become climate neutral if we turn around in the next ten years, how long before we see zero emissions?

**Philip Sutton:** Given the capacity that we have, if we were able to mobilise with a level of intensity that we had during the Second World War then I have no doubt that we could get to zero emissions economy within ten years. Some work that's been done in Victoria by the Beyond Zero Missions group they've been looking at the idea of how to get to zero within ten years and then just recently they developed a particular scenario where they believed that there are technical changes in the types of energy products, insulation, water heating technologies that we use etc. that would enable us to actually have a 50% reduction in emissions within the space of three to four years once the program was actually initiated.

**Alexandra de Blas:** You've written this book and you've started a network but what are you going to do to create the awareness that this really is an emergency, that it is potentially catastrophic and we have to move immediately. People are starting to think that way but how do you actually initiate a climate code red, like you initiate a code in a hospital?

**Philip Sutton:** People need to get used to the idea that we need to declare an emergency, we need to think that this is an emergency and it's the first step. One way to do that is to actually do it for yourself so you say OK, in my household, for my family, for our community or whatever, we think we are in a state of climate emergency, sustainability emergency. So you declare it locally and build it up so you might encourage your neighbours, encourage the local council to do it and then encourage the state government to do it and so gradually build it up from the grass roots. If people are used to thinking that way then I think it can happen. If you just sort of said well you know how are we going to get the world to suddenly declare a climate emergency it's not going to just suddenly happen at that big scale without a lot of build up from within communities right around the world. We obviously need to work with people who are interested in Australia need to work with people in every other country to ramp this up.

One of the things I think people need to remember is that once people actually realise how serious the problems are, and this is a critical part of getting the change, then there is nobody who is in a sense on the other side. Whether you're a coal industry executive or whoever you are, when you actually look at what's going to happen to your children, or for that matter yourself in your older age if we don't get this issue under control, then I think people will realise that we don't have sides in this issue, we just simply have people who have woken up to the problem and people who haven't.

**Alexandra de Blas:** What are you going to do to influence government?

**Philip Sutton:** In fact we wrote the book *Climate Code Red*, originally as a submission to the Garnaut Review so we have made it available through the official processes and we now have a network of people working on this who are taking copies of the book to as many government officials and politicians and ministers in government as they can get access to. And we also feel that we need to work at both the top end of the hierarchy and the grass roots simultaneously. So one of the particular pieces of work we think is very important is to create a manual which shows you how you would actually implement a sustainability emergency so you can go to government and say look, here's literally down to the fine detail how you can

possibly do it so people can imagine it. And once you can imagine it then you can start to think about how to do it.

**Alexandra de Blas:** How far are you down the track with that?

**Philip Sutton:** We've sketched out some of the initial ideas in our book *Climate Code Red*, and we're initiating a project at the moment to in fact produce the first draft if you like of that manual.

**Alexandra de Blas:** How widespread do you think that will become?

**Philip Sutton:** We put the first version of *Climate Code Red*, up on the web as a pdf in February this year. We now have had people contact us from literally right around the world who are now campaigning using this tool. So we're quite confident that already there are the beginnings of a movement that would in fact link people in all the major countries of the world.

**Alexandra de Blas:** So what does this do that's really different?

**Philip Sutton:** I think we actually take the problem seriously and we say that we don't want to simply have a less dramatic disaster than might otherwise occur, we want to have a safe climate and we then rigorously go to try and work out exactly how you get that and what needs to be done. And every time we come across something that seems a bit harder or a bit difficult, if it's necessary we just say well so be it, we'll just have to work out how to make that hard thing happen. I'm reminded a bit of the experience of the effort during World War Two to produce the atom bomb, and the atom bomb itself was not a great blessing, but the process that they went through to produce it was interesting because when they started out they were concerned that the Germans would get the bomb and that would be devastating.

They didn't know how to produce a bomb, the science hadn't been worked out, all they knew was that you could split an atom and they thought they could do it with uranium and they just discovered this new element called plutonium. And so that was about as much as they knew and within the space of three years they explored all the different avenues of science, they identified a range of different industrial processes that could be used to deliver the raw materials for the bomb, every time they found a method that looked as if it might be possible or relevant they would actually test it and run it to see how it would go. And that was the only way they could deal with all the uncertainties while also having to get a result within a very compressed time frame. So we just have to be experimental, we have to use as much foresight and forethought as we can to work on a system basis but then we also need to be highly adaptive as we actually go into the crises and as we start to try and create the solutions.

**Alexandra de Blas:** If we are going to respond to this emergency what should happen to the coal industry?

**Philip Sutton:** Well the coal industry basically is now an obsolete industry I'm afraid and I think we all need to come to terms with that. They are hoping that carbon sequestration might sort of save the day but the thing is if we continue to use more and more amounts of coal then the demand for sequestration sites and the infrastructure for that is going to take a long time to ramp up and it's always going to be a problem of safety and so on. At this stage anyway it looks to me as if the simplest thing is to recognise that we need to move on from coal.

**Alexandra de Blas:** What are the key elements that we need to change in order to become carbon neutral?

**Philip Sutton:** The most effective thing to do is to stop using fossil fuels so when it comes to energy supply for base load energy we need a combination of wind power, wind turbines on a very large scale, we need concentrating solar thermal introduced into the system, we need to put in energy storage so that you can even out the energy availability. We need to emphasise urban planning approaches which make it possible for people to get around with minimum use of cars but that's a long term process. In the short term we need to be looking at the use of fully electric motor vehicles and hybrids as another possibility. The electric vehicles open up the potential of using their batteries in the off time that they are sitting around doing nothing to actually be part of the energy storage for the renewable energy supply so there's a positive synergy there. We need to also look at the way we can take carbon dioxide out of the air and one of the most interesting ways that's being examined at the moment is to grow vegetation and then heat it in an oxygen deprived environment and produce char and by products and you can produce synthetic oil and synthetic gas which could be used as part of the energy system. And then the black carbon char can be used as a supplement for agricultural soils which both improves the productivity of the soil but also gives us a way of getting that carbon out of the air and putting it underground in a safe way where it will be out of the way for thousands of years.

**Alexandra de Blas:** If we are going to massively increase vegetation don't we run into all sorts of problems in terms of displacing areas of land that are currently used for food production and we are seeing some of the consequences of growing vegetation for bio fuels right now which is partly leading to this increase in the cost of food around the planet. How realistic are these sorts of scenarios going to be?

**Philip Sutton:** If all we did was just simply say well we've got to grow a whole lot more trees so we can produce char and put it underground then that wouldn't work. But firstly the char itself improves the productivity of the existing agricultural systems so you'd actually get more food per hectare after you've treated the soil with the char than you would beforehand. But secondly we do need to look at the aggregate production of food and there's some very interesting work that's being done by a team in the Netherlands and they looked at how they could provide for production of high quality protein with much reduced environmental impact. They were using literally green houses as enclosed spaces for agricultural production to produce their food products and they were able to get massive increases in the productivity per hectare.

**Alexandra de Blas:** Personally how optimistic do you feel?

**Philip Sutton:** It's a really interesting question because if you sort of said well what are the odds of getting the right result out at the moment in one sense you'd have to say that things look pretty grim. On the other hand I actually have a genuine optimism about the capacity of humans to solve problems if they can get around to doing it. And so my effort if you like is now of focusing more and more on how do we actually catalyse that change because I think that we still have within our grasp the possibility of solving these problems substantially. There will be damage done but we're already well into the problem so we're not going to come out unscratched, unscathed, whatever. But I am actually optimistic and think we have the capacity to solve it if we decide to take on the job.

**Alexandra de Blas:** And do you think we can bring our carbon levels down below where they are now?

**Philip Sutton:** Physically? Absolutely - that's the least of our problems.

**Alexandra de Blas:** Well what's the biggest of our problems?

**Philip Sutton:** Deciding to take on the job and doing it and that means not just thinking that we hope someone else will, it means that in a sense each one of us has to say well I'm going to take on this job and I'll then work out what bit of it I can get some leverage on.

**Robyn Williams:** Yes up to all of us. Philip Sutton, one of the authors of *Climate Code Red* he was talking to Alexandra de Blas. Production today by Nicky Phillips and Charlie McKune. I'm Robyn Williams.

## **Guests**

### **Philip Sutton**

Director of Green Innovations

### **Presenter**

Robyn Williams

### **Producer**

Nicky Phillips