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## **Nuclear power a solution to global warming problem, says scientist**

**Reporter: Tony Jones**

TONY JONES: Professor Lovelock is convinced that without a radical change in power generation the planet will reach a tipping point within 40 years.

At that stage he says the process of global warming will be irreversible.

Many scientists disagree with his doomsday thesis.

But, as you've heard, his nuclear power solution is gathering some powerful adherents.

I spoke to James Lovelock at his house in the English county of Devon.

James Lovelock, thanks for joining us.

JAMES LOVELOCK, SCIENTIST & ENVIRONMENTALIST: Glad to be here.

TONY JONES: What do you say to those of your fellow scientists who still maintain that warnings of global warming are exaggerated or that the science behind them is flawed and inconclusive?

JAMES LOVELOCK: I have to tell them that they're unfortunately almost certainly wrong.

TONY JONES: Yes, indeed.

If they were to argue, to toss with you, though, what would you say?

JAMES LOVELOCK: I would say, "Look at the evidence that's coming in from the Earth, "particularly in the last year or so."

Two or three things stick out in my mind.

First was the summer in Europe of 2003 when over 20,000 people died, mainly in northern Europe, not in the south.

In France, southern Germany, Spain and so on, and this was an unprecedented event.

It was no mere heat wave.

A meteorologist had calculated that the odds against it being just a heatwave were 300,000:1.

Now, as a scientist, I take such odds as meaning it's almost certain.

TONY JONES: Why do you think, though, there is such a difference of opinion?

I know that perhaps the largest body of science is still behind global warming, but you still get some significant signs that some governments like to bring up as an excuse, if you like, for what they continue to do with their industry.

People like Professor William Gray from the University of Colorado who says the small temperature increases in the past 25 years are likely to be due to natural changes that have re-occurred in the planet for aeons.

JAMES LOVELOCK: Well, he would have been right 25 years ago, but things have changed.

Global warming is accelerating much as we predicted some time back, and the models made by good climate centres like the Hedley Centre here in Britain and the Potsdam Centre in Germany and I think one or two in America, particularly I think of the National Centre for Atmospheric Research in Boulder all tend to confirm that global warming is accelerating and likely to continue to accelerate and we approach a rather dangerous point in the near future.

TONY JONES: These are computer models?

JAMES LOVELOCK: Those are computer models, but they tend to underestimate what is actually happening in the world itself.

TONY JONES: There are, of course, sceptics once again deny that there is enough power in even the most powerful super computers to even come close to approximating what the actual climate is doing because it's so much more complex.

JAMES LOVELOCK: It would be truer to say that weather is exceedingly complex.

Indeed, it's chaotic, but climate is not so complex and it's perfectly possible to model climate change with a reasonable degree of confidence.

TONY JONES: Can you tell us a little bit about your own work?

There is no question that your own research has been absolutely central to influencing this debate.

From your work, what is the anticipated rise in global temperature?

What do you think is going to happen over the next decade, for example?

JAMES LOVELOCK: Well, I tend to think that those modellers who suggest that the global temperatures may rise 6 degrees Celsius or more are the ones to watch.

I think they're either right or they're underestimating.

Now, to put that into perspective, the change of temperature between the last Ice Age 12,000 years ago and now was about 3.5 degrees Celsius so we're talking about a change at least twice as great as the change from the Ice Age until now.

Now, that's horrendous when you think of it.

I mean, 12,000 years ago, the sea level was 120m lower than it is now and there were glaciers down as far as London.

It was a totally different world and it has all changed.

Well, the change we're going to see as a result of global warming is of that order or greater.

TONY JONES: How quickly could it be possible to see a change in temperatures of 6 degrees?

What time scale are we talking about?

JAMES LOVELOCK: Well, they're talking about, by the end of this century, a rising temperature as large as that may occur.

Now, the consequences of that rise, like the melting of the ice caps, will not immediately take place.

It will take hundreds of years for that to happen, but once it rises not 6, but merely 2.7 to 3 degrees, the Earth is committed to continue warming and the ice caps will then begin to melt.

TONY JONES: I think that's what is known as the tipping point, isn't it?

JAMES LOVELOCK: That's right.

TONY JONES: And one of the fears is when global ocean temperatures reach a certain point, there is no turning back.

JAMES LOVELOCK: Exactly, and we're not far off that tipping point.

This is really the crunch of it all.

The estimates are somewhere between a CO2 level of 400 and 600 parts per million we cross the tipping point.

Well, we're 380 now and it's rising at two points a year, so it's not long before we reach that tipping point.

TONY JONES: Professor Lovelock, is there any kind of consensus among environmental scientists now that that is the point we're headed towards?

JAMES LOVELOCK: It's difficult for me to answer that one because I tend to work as a solo scientist.

I meet the people in the climate community, but not often enough to give you a firm idea about a consensus.

All I can say is that the climatologists in this country and quite a few in Europe are agreed in this way.

I think in America they tend to disagree more.

TONY JONES: Your own work is concentrated on sea algae that's instrumental, as you say, in the formation of cumulus clouds above the sea.

What is the significance of what's happening there?

JAMES LOVELOCK: It's very significant.

It's really quite simple.

You don't need any complexity.

As the sea grows warmer, and there it is growing warmer, there is no doubt about that - measurements show it - so does the top layer tends to stabilise.

And when that happens, it's difficult for nutrients that exist in the waters below to mix up in it.

so the algae, the phytoplankton, begin to die from a lack of food.

As a result, the whole ocean ecosystem gets less and less and less.

Now, two things happen then.

If there is less algae, there will be less pumping down of the carbon dioxide because they need it to go.

And there is less emission of the gas that helps to produce clouds above the oceans.

The clouds reflect the sunlight back to space and act as cooling agents.

So as the Earth warms, the algae are being driven closer and closer to the poles and the tropics become a desert.

TONY JONES: What effect is that having on the great belts of ocean currents which actually drive so much of our climate at the moment?

JAMES LOVELOCK: I don't think anybody is quite sure about it.

Most modellers feel that the north Atlantic drift, what we call the Gulf Stream may collapse and start flowing, but nobody has agreed as to whether that would produce disastrous cooling in northern Europe, even though the rest of the world is fine, or whether it will do very little.

We will have to wait and see because it's almost certain to happen.

TONY JONES: James Lovelock, the critical question is, right now do you believe we're in a situation where this is actually reversible.

JAMES LOVELOCK: We are now.

This is the whole crux of it.

This is why I keep advocating governments to use nuclear powers to kind of bandage, to produce energy without putting CO2 in the air while they find better ways of doing it.

I admit that nuclear has a few dangers, but they are trivial compared with the dangers of just letting global warming happen.

I don't think people understand.

If we get this 6 degree Celsius rise of temperature by the end of the century, we're talking about billions of deaths.

TONY JONES: How much time do we buy by taking the nuclear power option and how widespread would it have to be to make a genuine difference in the world?

JAMES LOVELOCK: Well, to answer the second part first, it would have to be quite widespread.

Most governments would have to weigh in towards getting 20 per cent to 50 per cent of their power from that source.

I never see it as the only source, but we have very little time to do it in.

It usually takes a long time to set up a nuclear power station because there are so many hearings and objections to putting it up.

I think there would have to be Draconian and stop that and put that up straightaway and they could probably do it in five years.

The French reckon that's how long it takes.

TONY JONES: Your arguments seem to have won over at least one world leader.

Tony Blair is saying Britain may need to build an entire new generation of power stations in order to defeat the threat from global warming, but if you're right, all world leaders are going to have to start taking that decision.

JAMES LOVELOCK: I think so, but it's a puzzle to me.

The French are not in the least bothered about it and they're actually going to increase their already heavy dependence on nuclear power.

Lots of countries are doing it.

It's just Britain and Germany that seem to be afraid of tackling it.

TONY JONES: One of the problems, of course, with the nuclear power solution is that most environmentalists appear to hate it.

How can you possibly get this message across to the green movement around the world which bitterly opposes nuclear power stations?

JAMES LOVELOCK: Well, I am a green and one of the original greens, and I've been advocating it for years, and they will listen to me, but they don't act.

And I think they don't act because the green movement is to an extent, political, and it depends on the perception of its supporters, and it's not so much the leaders of the green movement, I think that have to be persuaded, but the public at large, and this is where the media comes in.

I think they could do a good job on this.

I mean, for example, whenever nuclear waste is talked about, people start rabbiting on how it will destroy the whole biosphere.

This is absolute nonsense.

It's a tiny quantity, a small lump of stuff.

Nobody ever mentions that the yearly output of carbon dioxide would fill an area a thousand miles wide and 10m high.

It will cover the whole of the British Isles and part of Europe in a blanket of CO2 10m high.

That's the amount we put out of coal waste, if you like and oil waste every year.

TONY JONES: What do you say then to 24 scientists who believe there are potential new technologies where you can actually pump the CO2 back underground and hold it and store it underground?

I think it is a splendid idea.

The problem is all of those are at the early development stage and so are all of the renewables, whereas nuclear is standing there ready.

It has had 40 or 50 years of trial.

It is now well engineered and quite safe and they could use it straightaway.

All these other things would take 30 to 50 years to develop to the point where they were global supplying

energy on a reasonable scale.

That's what I feel.

TONY JONES: What do you think will be necessary to achieve a breakthrough on this point to get world leaders to understand that you may be right and the threat is to the existence of the world, when so many of them are simply refusing to do so?

JAMES LOVELOCK: Well, I'm sorry to have to answer that by saying that the world itself will tell them.

The rate at which nasty events are happening is accelerating and it won't be long before the public are starting to say, "My God, we must do something about this."

TONY JONES: Now, professor, it was you that came up with the Gaia theory of the world.

What happens to Gaia?

What happens to the world itself as opposed to the human population, I suppose.

If this process just continues, will the world correct itself at some point?

JAMES LOVELOCK: It will, but its time scale is much longer than ours.

If we just, you know, go for broke, business as usual, it will take thousands of years for the system to get back to where it's at before we started.

It will not matter a damn to Gaia.

It suffered far worse things in its 3.5 billion years of existence and what we're doing is bad mainly for us and mainly for civilisation because that's the most fragile thing.

I think no amount of change will kill off people altogether.

There will always be breeding pairs of humans around, but civilisation is much more fragile.

What worries me is I don't want to go back to another Stone Age and start all over again.

TONY JONES: You have been in this game, if I can put it as crudely as that, for a very long time.

You have been making these warnings for a very long time.

Now you say we're reaching the stage where it's getting desperate.

Do you despair that nothing will happen?

JAMES LOVELOCK: I don't despair ever.

It's not my nature to despair, and I might add that in the past I've tended to be much more on the sceptic side than on the side of the doom mongers, but this time I really do feel it is deadly serious and we have very little time to do anything about it.

That's the main message.

I think despair is the wrong attitude altogether.

One way to look at it is we've chosen to go to war with the Earth itself.

And the Earth, Gaia, is a powerful enemy, much more powerful than we are.

Professor James Lovelock, I'm afraid that's all we have time for.

We will have to leave it there, but we thank you very much for joining us tonight and hopefully we can come back to you as the world leaders decide what to do about this problem.

Well, thank you for a lot of very, very helpful and useful questions.

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