

Chasing the Wind

Climate Change - crisis or con?



Climate change - crisis or con? is the name of a television debate to be aired next week on national TV. In the programme, the studio audience will listen to four expert speakers and then ask questions about climate change. At the end they will vote on any action that should be taken.



The studio debate will be run in the following way:

The presenter introduces the debate by outlining some of the issues of climate change. The presenter asks each speaker to give their five minute speech, then asks for questions from the audience. The questioner must say who the question is for.

Finally the audience votes individually for what type of action they would like to see on climate change (if any!).

You will take part in the debate. You will play the role of one of the speakers or a member of the audience. You will be provided with information and time to prepare.



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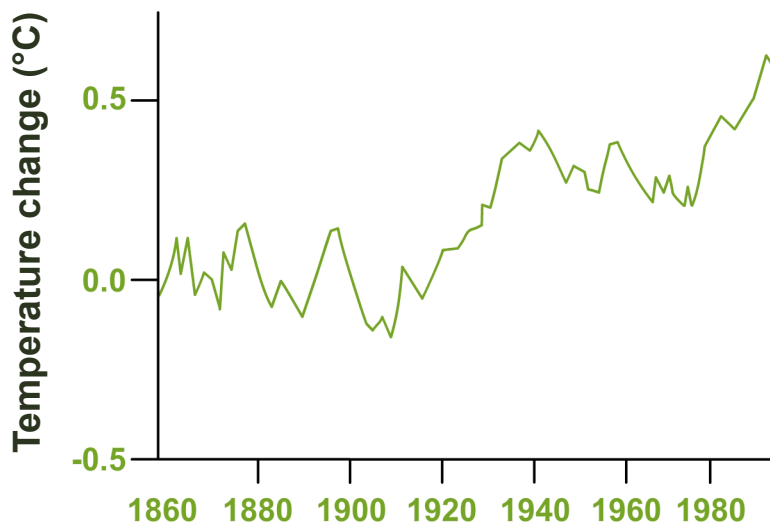
General Briefing

What is global warming?

Global warming is the gradual rise in average sea temperatures across the globe. Temperatures have been rising since the last Ice Age but the increase has accelerated over the last 100 years.

Since records began in 1860, the average temperature across the world has risen by about 0.5°C . By studying ancient ice in the Antarctic scientists discovered that the 1990s were the warmest decade for thousands of years.

Global warming also affects the atmosphere. Extra energy passes into the atmosphere making it more turbulent. This increases extremes of weather phenomena like hurricanes, heavy rainfall and even droughts. Stable patterns in world weather are being disrupted by this more turbulent air flow around the globe.



Do we know what is causing global warming?

Most scientists believe that global warming is caused by the greenhouse effect. In a greenhouse the glass traps the heat in the greenhouse. Similarly, the Earth's atmosphere contains gases that trap the heat inside the atmosphere. This is called the greenhouse effect. The gases that cause the greenhouse effect are called greenhouse gases. Greenhouse gases include carbon dioxide, methane and oxides of nitrogen. The recent increase in greenhouse gases is leading to a rise in the Earth's temperature. This is causing the polar ice caps to melt and the sea level to rise. This may mean that some cities and islands could be flooded in the future. It is also causing changes in the climate causing drought in some parts of the world and flooding in other parts.

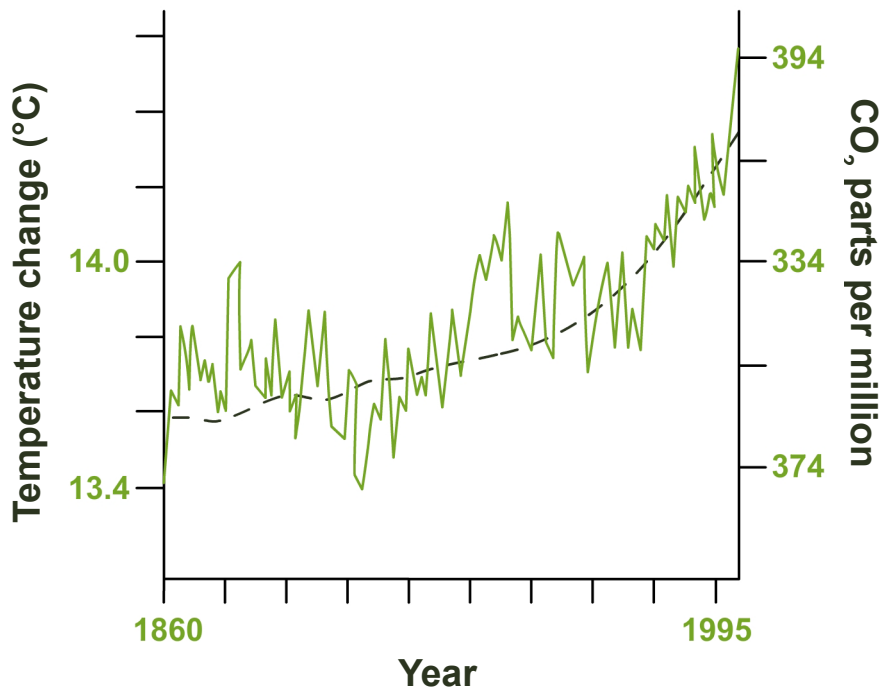


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What is the evidence that greenhouse gases have caused global warming?

The graphs of carbon dioxide levels and average temperatures over the last hundred years match almost perfectly. This suggests a link between the two. Levels of carbon dioxide in the atmosphere are now 30 per cent higher than 150 years ago. Levels of other greenhouse gases like methane are up by an incredible 145 per cent. This link is not a coincidence. It suggests that the increase in greenhouse gases has caused the temperature of the Earth to rise.



Who is producing these greenhouse gases?

Developed (richer) countries emit much greater amounts of carbon dioxide than developing (poorer) countries. In 1995 on average each American produced 19.6 tonnes of carbon dioxide. This is five times higher than the world average. People in developed countries burn huge amounts of fossil fuel, in industry, to provide energy at home, and to run cars. All this produces carbon dioxide. These countries have one twentieth of the world's population, but they produce one-quarter of the world's carbon dioxide emissions.

An international meeting in Kyoto, Japan, in 1997 set targets for reducing emissions of carbon dioxide. But since then the developed countries have done very little to cut their carbon dioxide levels. In fact another international conference on climate change at the Hague in 2000 broke up with no agreement on how to cut emissions.

What else is contributing to global warming?

The cutting down of the world's forests has a great effect on global warming. This is because when trees carry out photosynthesis they absorb carbon dioxide from the air.



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The effects of global warming

Global warming is having an impact on life on Earth. For example, polar bears in the Arctic are struggling to survive. They feed on seals that are trapped on the surface of the ice flows or come close to the surface of the ice for breathing through holes in the ice. The ice is now melting earlier in summer than ever before. The seals are out of reach of the polar bears, thus leaving the polar bears without food.

Coral is sensitive to temperature change. During 1998, the water temperature in the Pacific Ocean rose by 2°C for several weeks. Half the world's coral reefs suffered serious damage.

Global warming has claimed its first extinction. The famous 'golden toad' of Costa Rica has become extinct because the rainforest where it lived now has too many dry days.

Serious diseases like malaria are increasing. Mosquitoes that carry the diseases can now live in places which used to be too cold for their eggs to survive in winter.

The El Nino effect of 1999 was much stronger than average. Sea levels are changing, and computer models predict that there will be more disasters like the Solomon Islands. Hurricane damage is increasing, for example, in 1998, 11,000 people were killed by hurricane Mitch.

Flooding in Bangladesh in 1998 made 20 million people homeless. Famines and diseases in central Africa have left millions starving.

Another view

Not everyone accepts that global warming is a serious threat. Some scientists agree that the planet is warming up, but believe this is part of a natural cycle. They don't think human activity is responsible for the change. A minority of scientists suggest that global warming is actually a con and that the greenhouse effect is unproven. They quote the evidence below.

Global temperatures are not rising

Satellites have been measuring temperatures in the lower atmosphere for 20 years. The data shows no evidence of any rise in temperature. The temperature of the stratosphere has dropped 0.6°C per decade. If the atmosphere is not warming, how can the climate be changing?

Is all the data reliable?

Temperatures measured by stations on the ground around the world seem to show the Earth has warmed a tiny amount. But this data may not be reliable. Some countries do not maintain their equipment very well. Some of the measuring is also done in cities. But the number of people living in the cities has grown. So the rise in temperature might just be the result of more activity – using more heating, more transport, etc.



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Natural disasters have always happened

Even if the world is warming, you cannot be certain that global warming causes an individual disaster. It could be due to natural causes. Evidence from layers of sediment at the bottom of the ocean suggests there has been far worse weather. Over the past 10,000 years there have been decades of fierce monsoons in Africa, and hundred year droughts in the USA.

Greenhouse gas emissions don't lead to global warming

The climate is very complex. Carbon dioxide levels are just one small part of it. We cannot be certain that increasing carbon dioxide levels will cause the whole of the Earth's climate to change. It is possible that the oceans, or the forests of the world will absorb the extra carbon dioxide in the atmosphere. We don't yet know.

Some scientists disagree with the conclusion that higher carbon dioxide levels cause global warming. They believe computer predictions about rising temperatures are wrong.

Global warming is natural and has happened in the past

The Earth's temperature and climate has changed many times in the past. At the end of the last Ice Age, 15,000 years ago, we know the temperature in the Arctic rose a massive 5°C in 5 years.

Recent evidence from deep frozen ice shows the Earth going from warm to cold at least four times in 420,000 years. People producing carbon dioxide could not have caused most of those occasions.

Changes in the radiation coming from the Sun alone could be causing global warming. Some scientists believe that more radiation from the Sun causes fewer low level clouds to form. High-level clouds reflect back heat from the Sun that has heated the Earth's surface. Low-level clouds trap heat. This would make the Earth heat up, if the low level clouds were not there to trap the heat.

Audience member briefing

You have been invited as a member of the studio audience. You will be able to ask any of the experts two questions. Do your research before the debate to think up some good questions and make sure you already understand what the issues are about. Don't be afraid to ask the speakers awkward questions. You want to dig deep into the issues!



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Audience member briefing

The panel of experts



Dr David MacKenzie

Dr David MacKenzie is a scientist who believes that increases in carbon emissions are causing climate change. He works at the Centre for Climate Change in the UK.

Dr Chuck Webster

Dr Chuck Webster is a scientist who believes that global temperatures are not rising and global warming is not caused by greenhouse emissions. He has recently been asked to contribute to the US government's policy group on global warming.

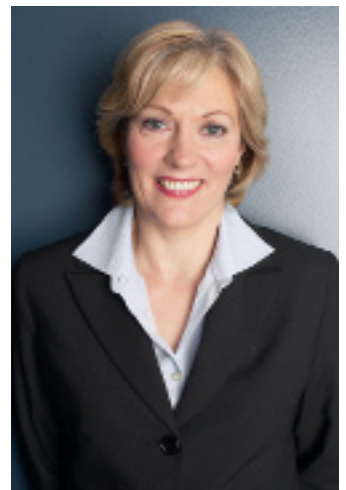


Professor Nina Patel

Professor Nina Patel is a scientist who believes that some of the effects of global warming will be positive. Her work at Oxford University is based on the effects of temperature changes on soil microorganisms.

Jayne Walsh

Jayne Walsh is an environmentalist who is very concerned about the effects of climate change. She was the scientific advisor to Greenpeace for many years.



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Expert briefings

Dr David MacKenzie

Dr David MacKenzie is a scientist who believes that increases in carbon emissions are causing climate change



Your views

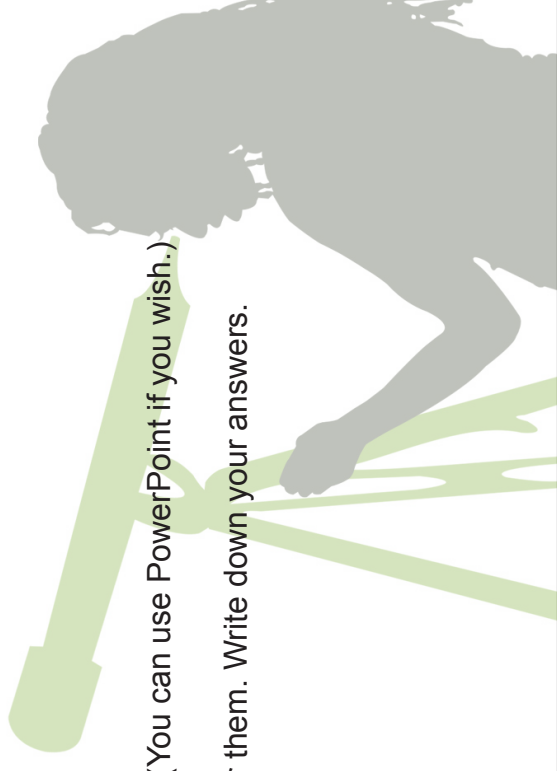
- Human activity is leading to an increase in carbon emissions.
- Carbon emissions are causing global warming.
- Global warming is leading to climate change.
- All the countries of the world must unite to reduce carbon emissions.
- This should be achieved by reducing the use of fossil fuels to produce energy across industry and transport.
- One way to achieve this is by using renewable sources of energy.

To prepare for the studio debate

- Research the issue from Dr MacKenzie's point of view.
- Write a five-minute speech to put forward your case as strongly as possible. (You can use PowerPoint if you wish.)
- Practice your speech.
- Think about what questions you could be asked. Prepare how you will answer them. Write down your answers.

Useful websites

<http://www.bbc.co.uk/climate>.
<http://green.nationalgeographic.com/environment/global-warming>
<http://www.climatechallenge.gov.uk/understand>
<http://www.bbc.co.uk/sn/hottopic/climatechange>
<http://www.defra.gov.uk/environment/climatechange/index>



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Global warming

Jayne Walsh

Jayne Walsh is an environmentalist who is very concerned about the effects of climate change



Your views

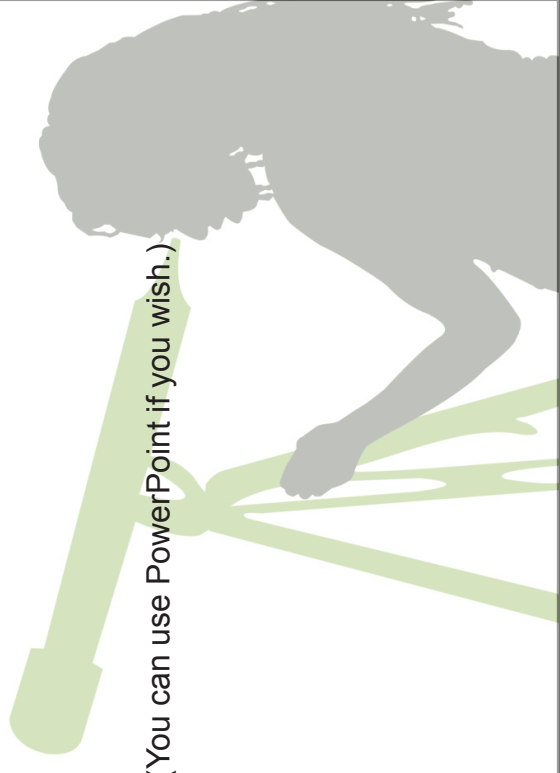
- Average temperatures across the world have risen.
- The ice caps are melting.
- Sea levels are rising.
- Serious diseases are increasing.
- Seasons are changing and effecting migration patterns of animals.

To prepare for the studio debate

- Research the issue from Jayne Walsh's point of view.
- Write a five-minute speech to put forward your case as strongly as possible. (You can use PowerPoint if you wish.)
- Practice your speech.

Useful websites

<http://www.bbc.co.uk/climate>
<http://green.nationalgeographic.com/environment/global-warming>
<http://www.climatechallenge.gov.uk/understand>
<http://www.bbc.co.uk/sn/hottopic/climatechange>
<http://www.defra.gov.uk/environment/climatechange/index>



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Dr Chuck Webster

Dr Chuck Webster is a scientist who believes that global temperatures are not rising and global warming is not caused by greenhouse emissions



Your views

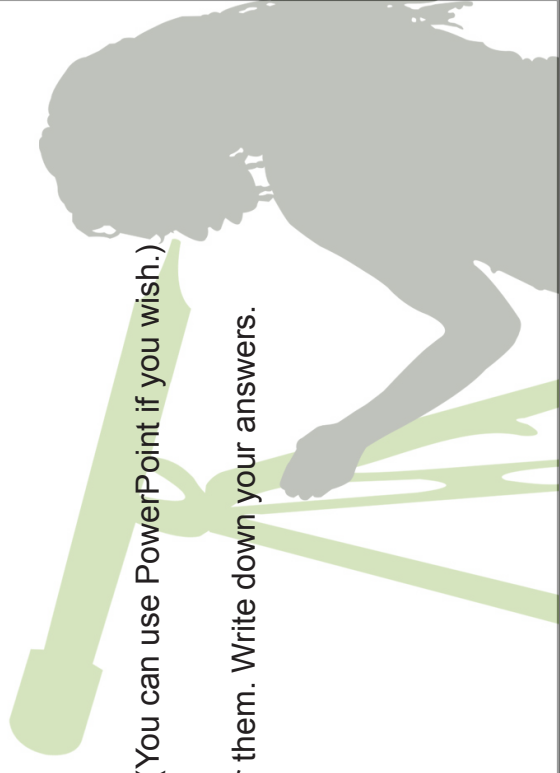
- There is evidence that global temperatures are not rising.
- The climate is very complex – carbon emissions play a small part.
- Changes in radiation from the Sun could be causing global warming.
- The Earth goes through cycles of temperature change.
- Computer predictions about global warming are wrong.
- Cutting down rainforests has a much greater effect on global warming.

To prepare for the studio debate

- Research the issue from Dr Webster's point of view.
- Write a five-minute speech to put forward your case as strongly as possible. (You can use PowerPoint if you wish.)
- Practice your speech.
- Think about what questions you could be asked. Prepare how you will answer them. Write down your answers.

Useful websites

<http://environment.newscientist.com/article/mg18524861.400>
<http://www.heartland.org/Article.cfm?artId=812>
http://en.wikipedia.org/wiki/Global_warming_controversy
<http://www.bbc.co.uk/climate/evidence/sceptics>



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Professor Nina Patel

Professor Nina Patel is a scientist who believes that some of the effects of global warming will be positive



Your views

- The warming of areas such as Northern Canada and Siberia could mean that they become productive and habitable areas.
- Some endangered species may thrive.
- Some diseases such as influenza may decrease.
- Oil and gas deposits under ice may become accessible.

To prepare for the studio debate

- Research the issue from Professor Patel's point of view.
- Write a five-minute speech to put forward your case as strongly as possible. (You can use PowerPoint if you wish.)
- Practice your speech.
- Think about what questions you could be asked. Prepare how you will answer them. Write down your answers.

Useful websites

<http://www.thefirstpost.co.uk/index.php?menuID=1&subID=1155>
<http://www.thefirstpost.co.uk/index.php?menuID=1&subID=1088>
<http://www.thefirstpost.co.uk/index.php?menuID=1&subID=883>
<http://www.thefirstpost.co.uk/index.php?storyID=1427>

