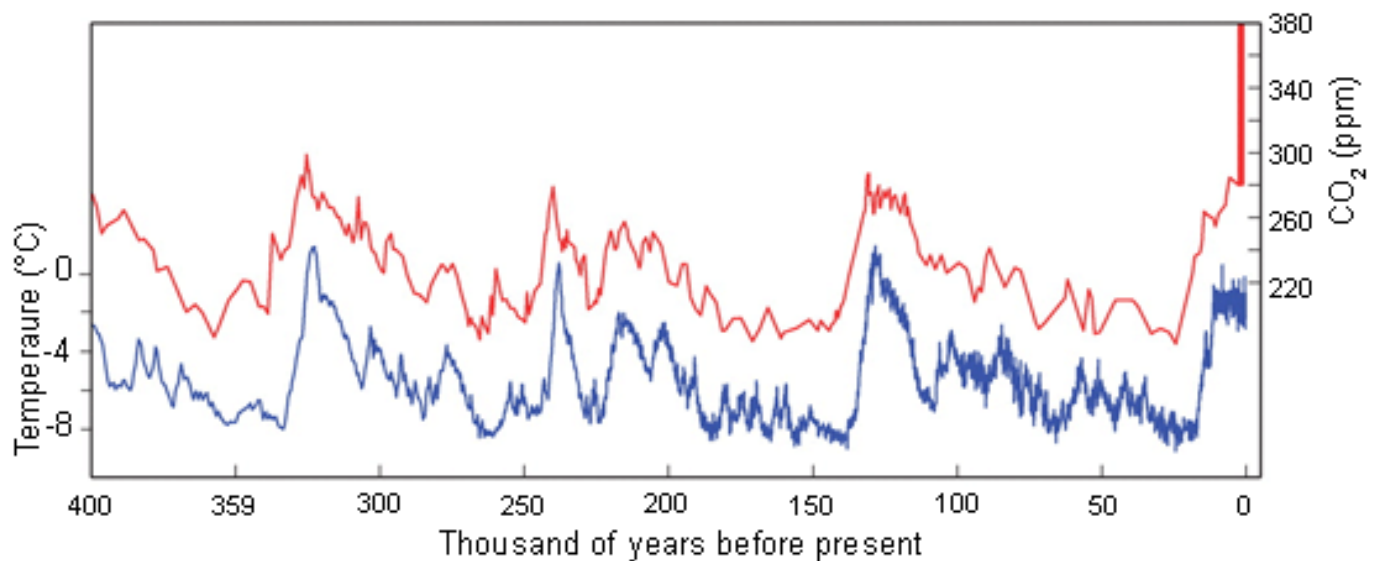


FACT SHEET (APRIL 2009)



THE SCIENCE OF CLIMATE CHANGE: WHAT YOU NEED TO KNOW



This graph, published in the journal *Nature*, shows a striking correlation between the levels of CO₂ in the atmosphere and temperature over the past 400,000 years. During this time, the CO₂ level was never above 300 parts per million. Today, atmospheric CO₂ concentration has surpassed 380 ppm, and is rapidly climbing.

Scientists and international political leaders agree that **climate change is currently happening, that it is largely caused by human activities and that the implications are far ranging and very serious.** Although there are uncertainties around the predicted speed of change, the severity of that change and the nature and extent of its impacts, the fact that it is and will continue to happen is certain, therefore **we cannot delay action.**

Why should Northern Ireland act on climate change? **Climate change is already affecting Northern Ireland** both directly and indirectly through international agreements, markets and weather events. We need to take action to address both the adaptation and mitigation aspects to adjust to the changes we are already experiencing and need to take action now to decrease future impacts at home and abroad. These actions have direct and immediate economic, social and environmental benefits but will **cost far less now than if we delay.**

WHAT SHOULD WE DO IN NORTHERN IRELAND?

- **Use energy efficiently** – Northern Ireland people, business and government waste millions of pounds each year, which could be saved if we insulated buildings and decreased waste.
- **Increase security of energy supply** – diversify and decarbonise our sources of energy to increase security and decrease costs in the long-term.
- **Become more self-sufficient in food** – produce a greater variety of foods and sell them locally to decrease transport and improve farm viability.
- **Ensure climate change is factored into the design of all new infrastructure** - include both adaptation and mitigation aspects, building to the highest 'zero carbon' standards.
- **Provide the legislative and policy framework** to change to a low carbon economy, ensuring Northern Ireland business can lead in international markets.
- **Accept our moral responsibility to play our full part** in the global effort to combat this major threat to social stability by adopting local targets and changing our behaviour.

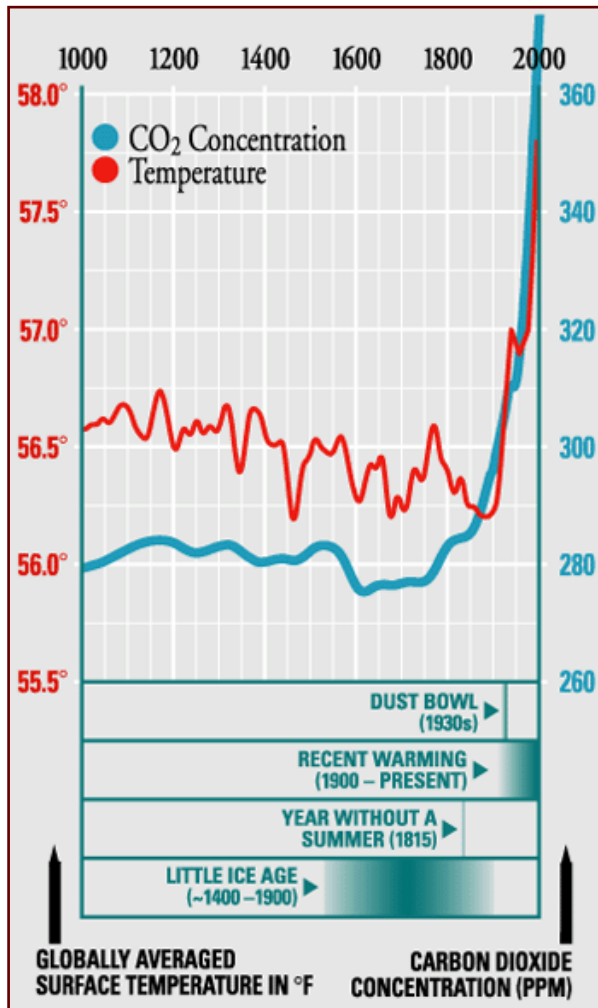
An internationally renowned group of scientists assembled in W5 (Odyssey Complex), Belfast for *Climate Change: Dealing with the Reality* on 20th January 2009. This conference formed the basis of this document.

FULL REPORT AVAILABLE FOR DOWNLOAD FROM THE NORTHERN IRELAND ENVIRONMENT LINK WEBSITE:
WWW.NIENVIRONMENTLINK.ORG

CLIMATE CHANGE IN NORTHERN IRELAND

.....if we do not address the issues, we risk being left behind as the rest of the world changes the way it works, acts and consumes. **Sue Christie**

There are many factors that contribute to climate change, but there is only one that we can address: our own contribution. Science is not about personal belief or political opinion. It is based on knowledge and the testing of hypotheses by trained professionals. Science can provide us with informed calculations of what may happen under various circumstances, and develop a variety of scenarios of what will happen if we carry on as we have been, showing us the consequences of existing behaviour. But that does not mean these scenarios are inevitable. **Science can give us the information we need to take judicious and timely action, which can help us avoid the worst consequences.**



This graph is based on data from tree rings, coral and ice cores, and historical records. It represents only the Northern Hemisphere. Since the 1900s global average temperature and atmospheric CO₂ concentration have increased dramatically.

Only by understanding the problem can we identify the solution. The more we learn, the more it is obvious that we face a crisis. The destruction of tropical forests, land-use changes and agriculture account for over a third of greenhouse gas emissions. Therefore, addressing biodiversity aspects is key to addressing climate change. Waste is a massive problem in Northern Ireland, with huge adverse climatic impacts, so tackling this could contribute significantly to reducing our emissions. Peak oil, pollution, agriculture and land use, economic recession and fuel poverty are all linked with carbon emissions. Whatever you want to call it — low carbon economy, green collar economy, sustainable development — it is all about the same thing: **changing the way we live to use less of the Earth's resources and reduce the amount of greenhouse gases we produce.** And it is not an 'option'. If we do not do it voluntarily and gradually, more severe changes will be forced upon us. **We now have an addressable crisis: if we do not act very soon — in years, not centuries or decades — we will be facing a catastrophe.**

Addressing the diverse and multitudinous aspects of climate change will not be simple, but it is possible. The science, technology and research are available to tackle it. What is less clear is if there is the political commitment and public willingness to change our current unsustainable lifestyles. And these are crucial. **Science and technology can provide the tools to solve the problem, but they can not solve it by themselves.** It is a global problem requiring global solutions, and action by all of us.

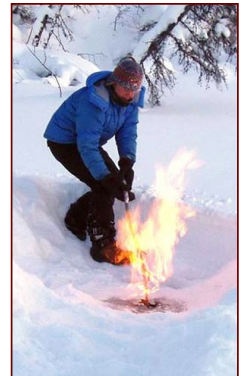
Wishing something isn't happening won't stop it. Recognising it, seeing the threats and opportunities, and moving in the directions those solutions point to will address the issue. The UK has led the way with the Climate Bill, and it is now time for Northern Ireland to play its part. **The local politicians can establish the framework and provide the local leadership to ensure that Northern Ireland as a whole and each of us as individuals can take effective action.**



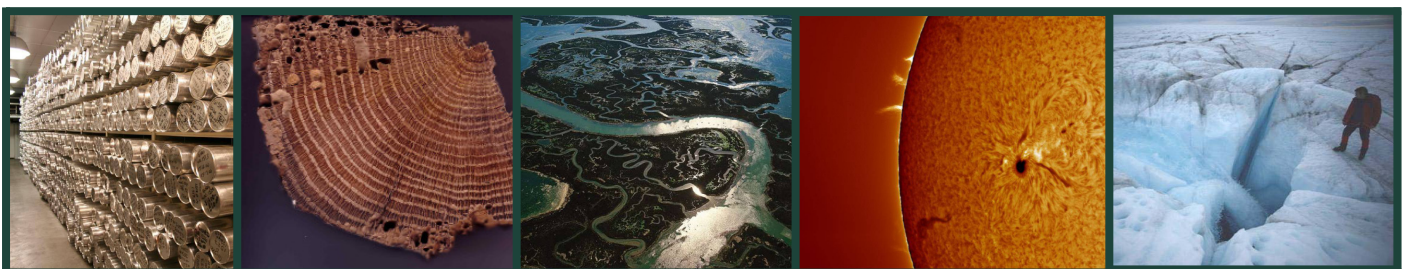
KEY POINTS FROM THE CONFERENCE

Because you don't know something exactly doesn't mean you can't plan for it. John Mitchell

- The overwhelming scientific consensus is that **climate change is happening and that human activity plays a major role**. Uncertainties exist in the timescale and magnitude of the impacts.
- **We must act now**, both to adapt to the unavoidable impacts and to mitigate against further increases in atmospheric greenhouse gases. In terms of the need to take action the finer details are irrelevant.
- Roughly two-thirds of carbon dioxide emissions result from the use of fossil fuels and one-third from land-use change and agriculture; both must be tackled as a matter of urgency. If we stopped emitting all carbon immediately, **the carbon already in the atmosphere commits us to 2–3.5°C warming by 2100**.
- Weather is short-term and highly variable whereas climate is long-term. Although we will still have colder years, the **general trend is one of warming**. Extreme weather events will not only occur more frequently, they will also often be more acute.
- Climate change cannot be dealt with just as a local issue. **A global perspective is required**. Social and economic impacts are hard to predict in detail, but will be hugely significant. The absolute rate of change is less important than society's ability to respond.
- To date, most carbon has been emitted by the developed world, but **developing countries are becoming increasingly significant contributors**. A concerted global effort with the developed world encouraging the developing world to do so in a sustainable manner is required.
- The **communication of science to both politicians and the public must be improved**. The differences between theory, fact and belief are not well understood by non-scientists.
- Past records show that the Earth's **climate can change rapidly over a small number of years** (not decades). There are a number of feedback systems and critical levels that can cause the climate to 'flip'. These are not considered within Northern Ireland's current policies and plans. As a society, Northern Ireland is not prepared for such changes.
- **Complex and interrelated factors and their impacts** are often poorly understood, but potentially highly significant on a local and global scale.
- There are **many interacting factors and potential 'tipping points'**. Understanding the complex results of such interactions requires a **multidisciplinary approach**. This is difficult to achieve but is vital to understanding the intricate relationships and improving the accuracy of climate models.
- The **oceans play a key and highly complex role in climate**. Our understanding of these impacts needs to be enhanced and communicated effectively.
- **Business is seeing the opportunities** presented by moving towards a low carbon economy and adapting to a changing climate, recognising the benefits of acting and the costs of not acting. This can only be good for society, especially in the current recession in Northern Ireland.
- **The cost of acting now will be much less than the cost of acting later**. We need to consider where we spend the money and how society will determine what actions are given priority.



Methane being ignited on release from a Siberian lake.



KEY QUOTES

Ice, Mud and Blood: Lessons from Past Climates (Prof. Chris Turney)

“By 2020, 75–220 million Africans will suffer from drought; there’s no precedent for the scale of future migration.”

“55 million years ago, huge amounts of greenhouse gases were dumped in the atmosphere. The world warmed up 5–9°C, and it was tens of thousands of years before conditions returned to what was then ‘normal.’”

Human-Induced Climate Change and Projections for the British Isles (Prof. John Mitchell)

“Current CO₂ concentrations exceed those of the past 400,000 years. This is not a natural cycle.”

“Warming will not happen smoothly. Extreme warm events will become commonplace by the second half of the century.”

Can we Predict the Impact of Climate Change on our Environment? (Prof. Mike Ellis)

“The absolute rate of change is missing the point. More critical is the rate of change to which societies can respond.”

Tree-Rings Expose our Poor Understanding of Past Environmental Change (Prof. Mike Baillie)

“It is a very bad idea indeed to tinker with the system. It might just ‘flip.’”

The Oceans: Recent Changes & their Effect on Long-term Climate Forcing (Prof. Ric Williams)

“Oceans have absorbed more than 80% of the heat added to the climate system.”

“One-third of the recent industrial emissions of carbon has gone into the ocean ...long-term uptake is inhibited by rising acidity.”

Could the Sun be Responsible for Climate Change? (Prof. Joanna D. Haigh)

“Although the Sun has a major impact on the Earth’s climate, there is no scientific evidence that the current trends relate to any of the solar cycles.”

Earth: The Power of the Planet (Prof. Iain Stewart)

“Society, rather than nature, decides who is more likely to be exposed to dangerous impacts of climate change.”

*“If you were having brain surgery would you want a brain surgeon or a dentist?
The same applies to climate change science, would you believe a climate scientist or a philosopher?”*

Sea Level & Climate Change: 21st Century (Un)Certainties for the Coast (Prof. Julian Orford)

*“By 2050 current 1:100 year events could become 1:20 or even 1:5 year events.
By 2100 they might even become annual events. Do we prop up the banks, or do we prop up the banks?”*

Carbon Capture and Storage: Part of the Solution (Dr Garth Earls)

“The fraction of carbon retained in appropriately selected and managed geological reservoirs is very likely to exceed 99% over 1,000 years.”

Good for the Climate, Good for Business (Mr Mark Ennis)

“Under business as usual...Europe will be importing 94% oil, 84% gas and 59% coal.”

“Changing behaviour = Business opportunity for Northern Ireland...Embrace a sustainable future.”

Climate Wars (Prof. Iain Stewart)

“Few scientists are trained in communications...few communicators are trained in science”

“All scientific work is incomplete and is liable to be upset or modified by advancing knowledge. This does not give us freedom to ignore the knowledge we already have, or to postpone the action it demands.”

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