

## CLIMATE CHANGE AND CARBON FOR COMMUNITIES

### Responses to climate myths and denial (Updated 7<sup>th</sup> October 2013)

This note has been prepared by Keep Scotland Beautiful to accompany the CCF Climate Workshop. The information is based on a range of external published sources. Please see the related information note 'Information sources and resources' for further information.

This note will be updated regularly as new items are identified. We would welcome any suggestions for useful additions. Please contact [Julian.holbrook@ksbscotland.org.uk](mailto:Julian.holbrook@ksbscotland.org.uk)

#### There has always been climate change

- Many factors influence climate (orbit, sun, volcanoes)
- When taken into account – these cannot explain the temperature rises of last 100 years

In the past there have been regional variations in the climate – the Medieval warm period, the Little ice age. However, these do not compare with the increase in global (not regional) temperature of around 0.8 degrees in the last 100 years.

Much of this global increase has been in the last 50 years, during which time solar changes and volcanic activity have been minimal.

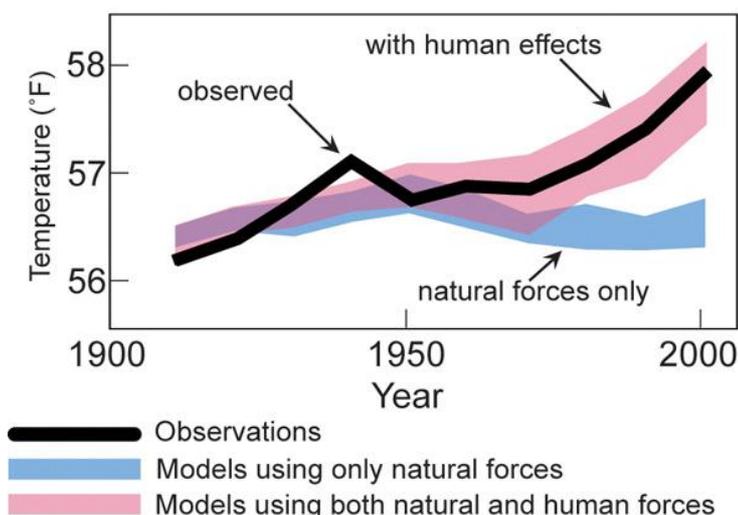
Current CO<sub>2</sub> levels in the atmosphere are about 35% higher than pre industrialisation and the highest they have been at any point in the last 800,000 years.

Chemical analysis has shown that the increase in CO<sub>2</sub> is a result of burning fossil fuels.

It has been estimated that the CO<sub>2</sub> from volcanoes has been about less than 1% of those due to human emissions.

CO<sub>2</sub> levels before the industrial revolution were about 280ppm. Until recently they have been 380ppm. In 2013, they reached 400ppm.

Atmospheric CO<sub>2</sub> levels are rising by about 15 giga tonnes per year, compared to emissions from human activities (26 giga tonnes/year).



If only natural factors are considered, then the blue curve shows the resulting temperature increase.

The Black line shows actual temperature increase that has been measured.

It is only when human activities are taken into account as well that the temperature observations can be explained.

### **Its all to do with the sun, or volcanoes**

- Very little change in solar activity since 1950s
- Emissions from volcanoes contribute less than 1% of the Co2 emitted by the human activities.  
Cooling effect
- May explain minor variability of last 1000 years, but not significant global warming of last 50 years.

There are many factors that influence climate change, including solar activity and emissions from volcanoes. There has been very little change in solar activity since the 1950s, so this cannot be included as a factor in temperature rises in recent decades.

Since the industrial revolution, human derived emissions have had more than ten times the effect on climate than the sun's output.

Co2 Emissions from volcanoes (0.3 billion tonnes/year) contribute less than 1% of the Co2 emitted by the human activities (29 billion tonnes/year).

Over the last 1000 years, changes in solar output and volcanic activity may have had an effect on the relatively small fluctuations/variability in climate, before industrialisation. Since industrialisation, the significant rise in emissions from human activity is now seen as the most likely cause of global warming and resulting climate change over the last 50 years. See IPCC report September, 2013.

### **Climate change is not really an issue**

- The world's climate has been relatively stable for around the last 10,000 years
- The last 100 years have been the warmest in the last 1000 years
- The models for the next 100 years show global increase in temperatures – not seen in the last 10,000 years. Can people and ecosystems adapt?
- These kind of increases can lead to positive feedback and tipping points, eg the melting ice caps and glaciers, ocean acidification, sea level rise

IPCC results published September 2013. All scenarios modelled except one show LIKELY increase of 1.5 degrees compared to 1850 to 1900.

All scenarios show that this may reach 2 degrees, but with varying confidence (Likely or more likely than not).

All scenarios except one show that warming will continue beyond 2100.

Most aspects of climate change will persist for many centuries even if Co2 emissions are stopped.

Over the last 10,000 years the average global temperature has been around 14 degrees and has only varied by +/- 1 degree. All of our cultures, civilisations, religions, settlement patterns and resource management have developed during this relative period of climate stability.

Keeping the climate stable is essential for natural systems upon which humans depend.

### **Computer models which predict the future climate are unreliable**

- We need to use models to project future climate change.
- They are tested to see if they can reflect previous trends before being used to project future trends.

- Climate models are tested against each other to see how sensitive they are.

We need to use models to project future climate change. They are tested to see if they can reflect previous and current trends well and before being used to project future trends.

Climate models are tested against each other to see how sensitive they are.

They cannot accurately predict the future, but can give us a strong indication of direction of travel regarding how the climate might change.

Climate modelling has tested different scenarios, different assumptions (economic development, population, policies, carbon abatement etc), but the range of possibilities are all in the same overall direction – an increase in climate change.

We all accept the use of models in other areas of our life, often without too much insistence on scrutiny. We place trust in specialists. For instance models underpin the safety of getting on a plane, investing in stock and shares, accepting future housing need projections and receiving medical technical care. In all of these risk has been assessed, assumptions made and value judgements made on our behalf.

By collating work from across many fields – it has been possible to give an indication of likelihood and uncertainty. However, as with all models – full uncertainty can never be removed.

The most recent work published by the IPCC in September 2013 confirms this. This is the most rigorous study involving many scientists, countries and peer review.

It gives the most recent and clear statement that climate change is an issue, not just now but for centuries to come.

### **There is no scientific consensus**

- The overwhelming majority of climate scientists agree that climate change is happening.
- IPCC report – 195 countries. Extremely likely!
- 928 peer reviewed articles in 10 year period – 0% doubted cause of global warming.
- 3,543 articles in popular press – 53% doubted cause.

Following the release of the ICC report in September and media coverage, there has been a criticism of how media coverage has handled the balance of strength of the scientific evidence alongside not rigorous statements made from climate sceptics. For instance experts have queried the BBC's 'false balance' in giving climate sceptics 'undue' voice on global warming study.

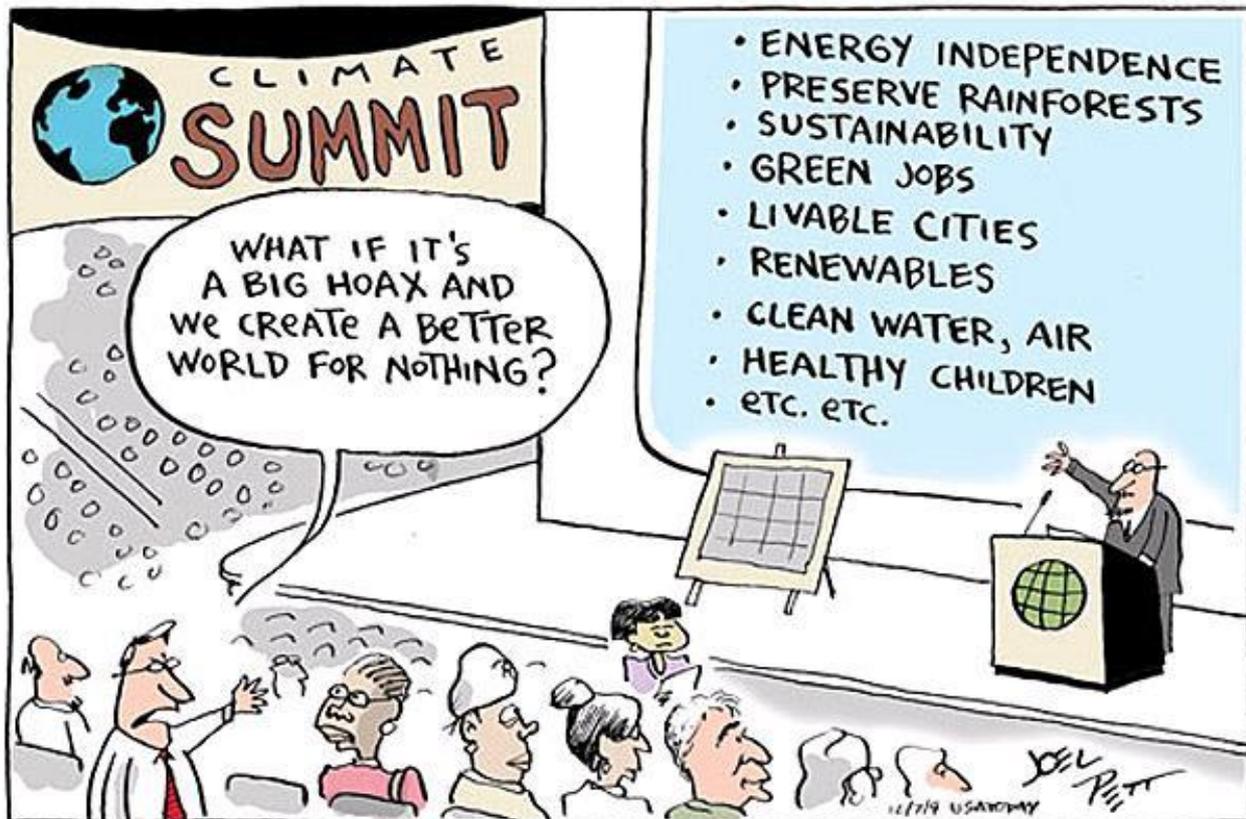
### **There are other more important and urgent problems to tackle**

- The weather can affect almost anything we do or make.
- Climate change is a compounding factor – it will aggravate our activities, processes and products

### **The cost of reducing our emissions would destroy our economy**

- We need to consider the cost of inaction against the cost of acting.
- Stern report
- Consider the costs of weather related disasters at home and abroad
- Impacts on global and national economies

Tackling climate change can bring many benefits. Policy makers often talk about low or no regret actions.



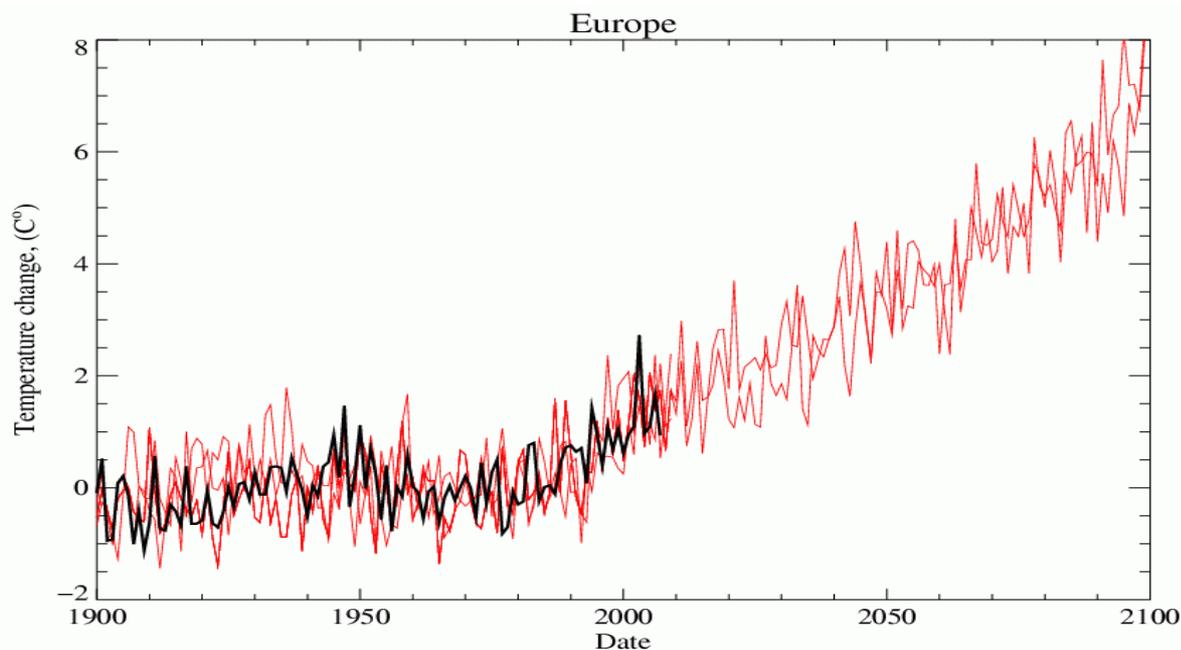
### Global warming means we will get better weather in Scotland

A look at the climate of the UK over a 30 year period (1961-1991) shows that low lying areas such as Edinburgh and Glasgow appear to have a climate that is roughly about 2.7 degrees different from that of London for the same period.

However, due to projected climate change it is likely that by 2050, these cities will have a climate more like London as it is now. By 2080 the climate might be more like southern Europe.

Whilst on the surface that might sound very nice, we need to consider that a small difference in the weather may not mean much, but a small change in the background climate is significant. We also need to remember this type of change in Scotland will mean we will find ourselves beyond what we have normally experienced.

Also as this climate change progresses, so will the frequency and intensity of our extreme rain events. An example of what future summers might hold is the 2003 heatwave that hit Europe. 35,000 people died across Northern Europe as a result of the 2003 August heatwave.



The graph shows the summer temperatures (June, July, August) between 1900 – 2003 and clearly demonstrates the accuracy of the climate model (red line to 2100) from when matched with observed climate (black line to 2003).

However, 2003 shows up as a sharp peak, an anomalous year, warmer than predicted by the climate model. 2.3°C warmer than average.

We can see that without human intervention to reduce CO<sub>2</sub> emissions, under a future medium-high emissions scenario, the hot summer of 2003 (currently estimated to be a 1/1000 year event) could be considered in future to be “normal” by 2040 and even “cool” by 2060s.

### It's the fault of the countries like China

- By not accepting our own responsibilities, this is projecting the problem onto others
- We have exported much of our carbon intensive manufacturing to other economies
- We need to recognise our historical global carbon contributions
- Other countries have a right to develop

Looking at these points:

**Responsibility** - Whilst China is now the largest emitter of Co<sub>2</sub>, ahead of the USA – note that per capita, people in China only emit one third of the Co<sub>2</sub> compared to people living in the USA.

**Exported carbon emissions** - One third of China's emissions are due to exports. Much of this is consumer goods imported by the west.

**Historical contributions** - China has only been responsible for about 9% of the Co<sub>2</sub> emissions in the atmosphere – the USA has contributed one third.

**Future development** – It does not follow that development needs to follow the model of western economies to date. China makes 80% of the world's solar panels and is installing renewables at a rate faster than any other country.

## Its not my problem – there is nothing I can do

- 40% of emissions come from the decisions we make as individuals
- Never doubt that a small group of people can change the world....it's the only thing that ever has. Margaret Mead, Anthropologist)
- Be the change you want to see in the world (Gandhi, Lawyer)

The Scottish Government's website provides information about the need for societal response from individuals, communities, businesses and organisations.

### Climate Change Behaviours Research Programme 2010-13

The 'Climate Change Behaviours Research Programme' (CCBRP) features a range of research projects, both in-house and commissioned work, to better understand: the behaviour areas that are central to addressing climate change and the most effective mechanisms for stimulating, facilitating and supporting new and more sustainable ways of living.

**Influencing Behaviours: Moving Beyond the Individual – the ISM Tool** – The ISM approach has evolved out of research undertaken as part of the CCBRP. The ISM tool offers a practical way for policy makers and practitioners to consider all of the contexts that influence people's behaviours - Individual, Social and Material - and the various different factors within those three contexts. The guidance on the ISM Tool consists of a [User Guide](#) which explains the tool, with case studies, and how to apply it in a workshop setting, whilst an accompanying [Technical Guide](#) provides more background and detail on the ISM tool and the different factors that influence people's behaviours.

The **Review of the Climate Challenge Fund** has investigated in depth the impacts of 21 community projects across Scotland looking to reduce carbon emissions and explored how they have been successful (June 2011). Research outputs include a [summary report](#), [main report](#) and [technical appendix](#).

**International Review of Behaviour Change Initiatives** - This key report from the University of Manchester reviews a range of interventions that have attempted to reduce the carbon intensity of consumption practices. The report also proposes a framework for understanding and developing behavioural change initiatives, based on Individual/Social/Material contexts (February 2011). Project outputs include a [research report](#) and [conference presentation](#).

**The Impact of Workplace Initiatives on Low Carbon Behaviours** - This research, commissioned jointly by the Scottish Government, Defra and the 2020 Climate Group, investigates 'what works' in delivering low-carbon behavioural initiatives in the workplace. Research outputs include a [main report](#), [case study report](#) and [good practice guide for employers](#).