

# CLIMATE CHANGE

## Newsletter on Global Warming for ANZ Friends April 2014



*Let us examine the dimensions of the challenge, that our responses might be adequate.*

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### **Introduction:**

*"If the climatic disruption is allowed to run its course, the final product is clear enough: a scorched and barren earth, sterile land with steaming oceanic sewage pools and a remnant human population struggling to find succour on a blistering impoverished landscape (George M. Woodwell, Woods Hole Research Center)."*

Unpleasant thoughts - yet emanating from a universally respected climate change research centre. So we incorporate them in our thinking. And they're echoed in the article by Professor Ross Garnaut on page 15 of this issue. (Ross Garnaut is a Distinguished Professor of Economics at the Australian National University and both a Vice-Chancellor's Fellow and Professorial Fellow of Economics at The University of Melbourne.)

To cheer us up a little is a rather whimsical article about Genghis Khan and the climate of his day. Followed by a report from the U.K. on the successful outcome of the divestment debate in the Anglican Synod. More details on this topic in the *Bright Now* story on page 8.

The story on page 4 on the halcyon days in Greek history illustrates how history often holds hidden clues on climate.

The brief introduction on *offset forestry* within which a link to a much longer article is well worth following up. The longer article is very well researched and detailed.

*Farming on Sand* is from Assam in the Brahmaputra River basin, showing the effects of flooding as a result of accumulating black carbon in the high Himalayas causing glacier melt.

*Spirituality and climate change: the key to the Franciscan approach* is the idea of the fundamental belief in the intrinsic goodness of the created world. By changing the way a person sees climate change, there is a change in personal and community lifestyle that reduces climate change impact. The Franciscans seem to be more articulate on the spiritual aspects than Friends generally, so let me know how you relate to this story.

The glimpse into Ross Garnaut's book about Australia in a hot world is something we should take to heart, because while Australia and New Zealand will suffer quite different meteorological effects of climate change, we share the same threats from the needs of various populations to move to more hospitable parts. Professor Garnaut says it's inappropriate to wait for a global agreement, we have about a decade in which to take meaningful action.

The next article explores the tracks we might take to reach zero emissions before it's too late.

If you're reading this online, do follow the *Only Zero Carbon* link in this story. The "Reduce emissions" plans put forward by many governments and local authorities only lead to ensuring disaster. Likewise, some advocate tax systems which would reflect the full ecological cost of goods and services. But fiscal measures tend to not be fair, and too slow. Whereas carbon rationing might be well worth considering.

The question, "Is there a point at which adding more CO2 will not cause further warming?" is succinctly answered in the last couple of hundred words of this newsletter.

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## Mild climate spurs Genghis Khan's cavalry

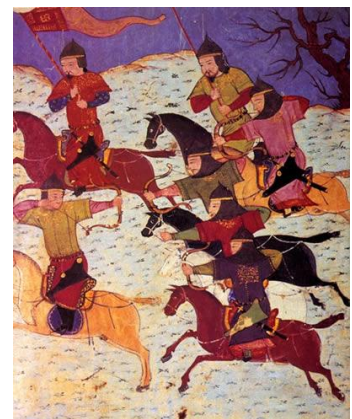
[Climate News Network](#)



by [Tim Radford](#)

March 12, 2014

*Mongol cavalry gallop across Asia – maybe assisted by changes in climate* Image: Sayf al-Vahidi via Wikimedia Commons



**Scientists have unearthed possible evidence that climate change played a role in the expansion of the Mongol empire of Genghis Khan. They say an exceptionally warm period promoted grass growth, vital for the Mongols' legendary horses.**

*LONDON, 12 March* - Climate change – already implicated in the fall of [Bronze Age civilisations in the Mediterranean](#) and in [the Indus Valley](#) - may also account for the rise of one of the most fearsome empires in history.

US researchers mapping the pattern of rainfall in medieval Mongolia think they may have identified a season of plenty that put Genghis Khan on the road towards world domination.

Archaeologists and climate scientists have identified sustained drought as a reason for the fall of the Minoan civilisation in Crete, and the decay of the Harappan culture in the Indus Valley 1,000 years earlier. But a team from Columbia University report in the [Proceedings of the National Academy of Sciences](#) that annual growth rings in a trove of stunted larches and Siberian pines in the Khangai mountains of Mongolia tell a different story.

### **Rings record**

The seasonal growth rings record a chronicle of harsh dry centuries dating back to 658AD. But between the years 1211 to 1230, something unusual happened.

Rain fell, and central Mongolia had one of the wettest periods in its history. The same period was unusually warm. Since those years coincide with the rise of the Mongol empire the connection suggested itself immediately: the Mongols were herdsmen and nomads.

Wet and warm weather means plenty of grass. Suddenly, tribesmen who wandered far to find grazing space had a surplus of feed, and soon of animals, including a glut of war horses and cattle.

The Mongol cavalry were famous for their horsemanship. "The weather may literally have supplied the Mongols with the horsepower they needed to do what they did," says Neil Pederson of Columbia's [Lamont Doherty Observatory](#).

### **All conquering**

For a brief period, the Mongols, led by a commander of remarkable military and political genius, and then by his descendants, conquered and ruled most of modern Russia, Korea, China, Persia, India, the Middle East and eastern Europe.

There is never just one reason for a civilisation's rise or fall, and historians have also argued that the Mongol invasions might have been driven instead by hunger and poverty in the Mongol heartland.

So the researchers would like to back up their tree ring evidence with studies of lake sediments, analyses of historical documents and so on, to establish that the steppes really could have provided for [the great khan](#) and his horde. The jury is still out.

The tree rings also show that after the first growth of the Mongol empire, the climate returned to its normal cold dry state. In the last 40 years, temperatures have risen. And since 1990, the country has experienced a series of devastating summer droughts often followed by a more than usually long cold winter.

### **Modern day drought**

After the last such, an estimated eight million animals died, herdsmen became impoverished, and the poorest have moved to the capital of Ulaanbaatar, which is now home to half of the nation's 3 million people.

“That last big drought is an example of what may happen in the future, not just in Mongolia but in a lot of inner Asia,” says Pederson. “The heat is a double whammy – even if the rainfall doesn't change, the landscape is going to get drier.”

The potential consequences for modern Mongolia, the authors warn, could be severe.- *Climate News Network*

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### **General Synod (U.K.) debated the climate – and the climate won**

by Ruth Jarman, Operation Noah Board Member

17 Feb 2014

On the morning of the 12 February I was glued to my computer watching a debate on the environment, live-streamed from the General Synod. This debate was the culmination of a lot of prayer, inspiration and sheer hard work on the part of a few of the Operation Noah board members and many other people. It really mattered to me, to Operation Noah and, I believe, to God, how the debate went.

I was hopeful; there was a lot of awareness out there. Rosalind Rutherford, a local member of the General Synod, emailed me and the other members of the Winchester Diocese Environmental Group, asking us to lobby her about the motion. And I knew that Giles Goddard, who spoke to the motion, would be compelling. As I watched, speaker after speaker spoke in favour of the motion with passion and knowledge. The people who run my Church really seemed to understand both the gravity of the crisis we are in and the responsibility of the Church to act.

When it came to a vote, Synod voted 274:1 with only 3 abstentions to ensure that the C of E investment policy is aligned with their policies on climate change, and to

establish a working group on the environment to monitor this and other environmental issues.

Most importantly, the question of disinvestment was discussed and not dismissed. The Church of England is now committed to seriously consider how its investments reflect the urgency of climate change, including the option of disinvestment from fossil fuels. But, as Giles Goddard said in his closing speech, this is just the beginning. Bright Now has now a clear mandate to raise awareness and encourage enlightened discussion on fossil fuel disinvestment.

The vote fell in Go Green Week, which is organised by Operation Noah partner People & Planet and is the UK's largest national week of student action on climate. This year the focus was on calling for universities, schools and colleges to 'break up' with the fossil fuel industry and go fossil free, and culminated in a day of action on Valentine's Day.

Operation Noah's press release on the synod vote is [here](#).

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by [Tim Radford](#)

## **Old Greek plays record halcyon days**

Climate News Network

March 8, 2014



*The theatre at Epidauros, where many of the leading dramatists' plays were performed  
Image: plusgood via Wikimedia Commons*

**History and literature provide evidence of consistently mild mid-winter weather in ancient Greece, helping climate scientists to reconstruct the past and so understand the future.**

*LONDON, 8 March* – In fifth century Athens, in January at least, the skies were clear and the rain stayed away. The days, to use a classical reference, were halcyon.

Two Greek researchers have combed the great plays of Aeschylus, Sophocles and Euripides and the bawdy comedies of Aristophanes to deliver [a long-term weather report for mid-winter days](#) from 458 BC to 401 BC. They report in the Royal Meteorological Society's journal [Weather](#) that, clearly, the city was a good place to hold open-air stage productions in mid-winter. Sophocles, in his masterpiece *Oedipus at Colonus*, actually says so:

*"A distant music, pure and clear rises from green secluded vales. The constant trill of nightingales deep in their haunts of tangled vine, of sacred ivy, dark as wine, thick is the god's inviolate wood; rich in berries and rich in fruit, the sun is curtailed; the wind is mute, in winter."*

To understand the climate of the future, scientists must reconstruct the patterns of the past, long before the first formal weather records. They do this by examining pollens in lake beds, growth rings in ancient trees, ice cores and ocean muds to deliver circumstantial evidence of bygone seasons.

### **Balmy mid-winter**

But there are also indirect references in human records: in [naval log books](#), in medieval tax records, in monastic manuscripts, and in chronicles from Baghdad in the golden age of Islamic scholarship.

Christina Chronopoulou of the [National and Kapodistrian University of Athens](#), and a colleague from [Panteion University](#) in the same city, decided to comb 43 surviving works performed during the Lenaia celebrations in mid-winter. They found seven clear direct and indirect references to the beneficial halcyon days of mid-winter.

The halcyon days are now [a cliché](#) but once referred to the myth of [Alcyone](#), the grieving widow who was turned into a kingfisher by the gods, and who nested on the beach at midwinter.

But the fact the ancient Greeks routinely watched and expected to watch drama in open amphitheatres during the Attic month of Gamelion, which ran from 15 January to 15 February, provides indirect confirmation of good weather. Halcyon days, say the authors, are "atypical winter-time weather periods characterized by sunny and calm conditions" and the result of a stagnant high-pressure system that dominates the area at such a time of year.

### **Observant dramatists**

And, as they worked through some of the great plays, they found enduring references to clear skies: in *Agamemnon*, by Aeschylus, in 458 BC a character spends his nights on the roof "to know thoroughly the throng of stars..." Aristophanes in *The Birds* in 414 BC describes a wedding. Attic weddings lasted for three days and were performed in the open air, another indicator of mellow conditions. *The Birds* also contains references to a "skiadeion", a parasol, an umbrella to provide shade from the sun, rather than shelter from the rain.

Euripides in *Medea* in 431 BC mentions “the temperate and sweet breezes” while Aristophanes in *The Frogs* in 405 BC actually addresses “you halcyons who chatter by the ever-flowing waves.”

“Combining the fact that dramatic contests were held in mid-winter without any indication of postponement, and references from the drama about clear weather and mild winters, we can assume that those particular days of almost every January were summery in the 5th and maybe the 4th centuries BC,” said Dr Chronopoulou.

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## **The Dyson Effect Carbon ‘Offset’ Forestry and The Privatization of the Atmosphere**

Corner House Briefing 15

by Larry Lohmann

### **Summary**

This briefing questions the view that tree plantations are a viable way of mitigating the climatic effects of industrial carbon-dioxide emissions. This “solution” to global warming is based on bad science, enlarges society’s ecological footprint, and reinforces neo-colonialist structures of power.

*This 15 years old, many pages long article of detailed research, well argued is really superb. Unfortunately I don’t have a URL for it, but can email you a copy of the whole thing if you email me: [sjplusam@gmail.com](mailto:sjplusam@gmail.com) Ed.*

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## **Farming on sand**



<http://www.climateneutralnetwork.net/2014/03/farming-on-sand/>

By Kieran Cooke

The Brahmaputra river is one of the world's mightiest rivers, with millions dependent on its waters. The river also brings misery, with flooding and erosion major problems: climate change is likely to bring more hardship. Kieran Cooke, one of the editors of the Climate News Network, has been in Assam in northeast India, meeting villagers living on the Brahmaputra’s banks.

Laupani village, Assam, 10 March – The holes are dug laboriously in the dusty, sandy

soil. Krishna Maya Sharma stops her work to wipe the sweat from her lined face.

“In the old days we would plant paddy here and have enough to sell at market” says Krishna, a 42 year old mother of six children.

“Now the soil is so bad, sweet potato is the only thing that will grow. The rest of our land is ruined.”

Laupani is a village in the north of the tea state of Assam, spread along the banks of the Brahmaputra river. In the distance, the pink evening light shines on the snow capped ridges of the eastern Himalayas.

The Brahmaputra, its waters rising more than 5,000 metres up on the Tibetan Plateau and flowing for about 3,000 kilometres through China, India and Bangladesh before joining up with the Ganges and out into the Bay of Bengal, is one of the world’s major rivers, 10 kilometres wide in places.

#### Widespread flooding

According to a recent report by India’s Third Pole organisation, the Brahmaputra carries a volume of water exceeded only by the Amazon and Congo rivers – and greater than the combined flow of Europe’s 20 largest rivers.

The river is a lifeline to millions, delivering vital nutrients to the soils of the plains but its fast flowing waters also cause widespread misery to people like Krishna.

Floods are frequent. There is widespread erosion and massive amounts of sand washed out of the river’s banks are deposited on surrounding fields, making once verdant areas into what looks like an enormous beach. The floods also bring invasive plant species that colonise agricultural lands.

More than 40% of Assam’s geographical area is designated as being flood prone: more than 1.5 million people were displaced by floods in 2012, lives were lost and whole villages were washed away.

#### Sand accumulations

“The waters were so deep and stayed so long that the grass was destroyed and our cattle died because they had no fodder” says Krishna.

“The sand means our land is no good anymore – my husband has given up being a farmer and is working in construction. Many young men go away to try and find jobs, there is nothing for them here.”

Locals – the majority of whom are poor, subsistence farmers – say river flows are becoming more unpredictable, with erosion and what’s called sandcasting becoming worse.

In part the flooding caused by the Brahmaputra’s waters is a natural phenomenon



which has been going on for centuries. As the river's waters cascade down from the Tibetan Plateau and Himalayas, millions of tons of sediment is washed onto the alluvial plains of Assam and others states in India's northeast.

#### Earthquake danger

There are other forces at work: the region is a highly seismic zone. In 1950 the Brahmaputra river basin suffered one of the most violent earthquakes ever recorded. The geology of the area was changed and the river level was raised dramatically, by between eight and 10 metres in places.

Climate change is another factor, with a combination of rising temperatures and accumulations of what's known as black carbon or soot in the high Himalayas and on the Tibetan Plateau causing glaciers which feed into upper reaches of the Brahmaputra to melt.

Increasingly unpredictable rainfall patterns, with periods of intense downpours, are also contributing to more volatile river flows.

Professor Jogendra Nath Sarma is a locally based geologist who has been studying the Brahmaputra for years.

"Over time different rivers in the Brahmaputra basin have merged, braiding over a very wide area. Thousands of square kilometres of land has been eaten away. Rampant deforestation is another big contributor to land erosion. "

In the past, says Professor Sarma, people would migrate to higher ground during the flood season but now, due to population growth and large scale immigration, there is nowhere for them to go.

#### Doubtful future

The future does not look good. According to models produced by scientists at the Indian Institute of Technology in Guwahati, Assam's capital, climate change will result in the Brahmaputra valley region experiencing more flood events.

The Institute says that not only will river peak flows increase: so will the incidence of pre-monsoon flooding, endangering key phases of the agricultural cycle.

Talk of climate change is not of great interest to Krishna, digging holes for her sweet potato plants. She has more immediate things to worry about.

"Life is getting harder. Every time the floods come, I wonder what will happen. But where else can we go?" - Climate News Network.

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### **Bright Now: towards fossil free Churches**

*Heavily abridged – for full text email [sjplusam@gmail.com](mailto:sjplusam@gmail.com)*

*The next issue of the newsletter will have a brief account of the 'Divest Seminar' hosted by the Methodist Public Questions Committee recently. Ed.*

Church investments are a sensitive area. Managed by dedicated and experienced financial advisors and church treasurers, they provide security for countless working and retired clergy and enable the infrastructure and buildings of the Church to be maintained and contribute to the mission of the church in a wide variety of ways.

However, this report sets out to challenge the status quo. Current ethical guidelines for investments are simply not adequate as humanity faces the overwhelming challenge of climate change. This report provides a clear and challenging case for the need to move church investments out of fossil fuels.

In doing so the Church would show its faith in a lowcarbon future, help reframe the debate and inspire hope.

Investment in renewable energy, energy conservation and sustainable infrastructure is consistent with Christian values and would provide much-needed capital and symbolic approval for these sectors. Moreover this report unpacks the growing risks around investment portfolios strongly biased in favour of fossil fuels.

In the Gospels (Mark 12: 28-31; Matthew 22:36-40 and Luke 10:25-28) Jesus gave us two commandments – to love God with all our hearts, minds, souls and strength, and to love our neighbour as ourselves. But how do we show our love for God if we stand by while his precious creation is damaged? How can we love our neighbour if we ignore the impact of climate change on poor communities?

Now is the time to act. Last year global energy-related CO2 emissions reached a record high, increasing by 1.4% to reach over 30 gigatonnes. The energy sector accounts for around two-thirds of greenhouse-gas emissions, as more than 80% of global energy consumption is based on fossil fuels. By showing clear moral leadership now, the Churches could influence the direction of this country, and others, towards a sustainable and just future.

Last year Operation Noah produced the Ash Wednesday Declaration which challenges all Christians to realise that concern about climate change, and care for this fragile and beautiful creation, should be central to our faith. This issue is a key outworking of this declaration.

Operation Noah is therefore calling on the Churches and the Christian community in the UK to:

- A) disinvest from companies involved in the extraction of fossil fuels
- B) take a leading and influential role in the national debate on the ethics of investment in fossil fuels
- C) support the development of clean alternatives to fossil fuels through their investment policies.

The total amount of carbon we can 'safely' burn, much of the world's known oil, gas and coal must be left in the ground. Fossil fuel companies should be using their knowledge, skills, expertise and resources to develop solutions to climate change rather than actively working to

accelerate the causes. The Churches have committed to respond to climate change, and they see ethical investment as an integral part of their mission. But their current ethical investment policies and practices do not make these connections.

They are not addressing the need to disinvest from fossil fuels. There is growing recognition among investors that they need to question their reliance on fossil fuels and to consider whether to begin disinvesting from them. We call on the Churches to act decisively. Negotiations for a new international agreement (the Doha deal) to hold global warming below 2°C (with a deadline of December 2015), provide a good opportunity for church denominations, to achieve complete disinvestment from fossil fuels, and to help lead the transition to a lowcarbon sustainable economy.

This report sets out the compelling theological, moral, scientific and financial reasons why Churches of all denominations should completely disinvest from publicly listed companies involved in the extraction of fossil fuels (oil, gas and coal), as soon as possible.

Climate change is already upon us and will intensify rapidly. Its worst impacts will be upon people in poor communities in geographically vulnerable regions. We need to make a decisive break with fossil fuel dependency.

Operation Noah's Ash Wednesday Declaration acknowledges that runaway global warming would be a disaster for present generations and for the earth, and would burden future generations with untold ecological debts. The Declaration recognises that, as Christians, we have a responsibility to heed the evidence and to act prophetically.

At current rates of oil, gas and coal consumption, in only a few more decades humanity will have emitted far more carbon than is compatible with a safe climate. Because proven fossil fuel reserves far exceed the capacity to adapt. Large-scale population displacement is highly likely, and future generations will suffer cumulative effects. "It would be a serious catastrophe for my country if much of the land in Bangladesh disappears under the sea. I become frightened to think that my grandchildren will have no place to live on this planet earth (Rt Revd Michael S Baroi, Bishop of Kushtia, Bangladesh)".

Humanity has always had the capacity to damage the environment, but we now have this to an unprecedented extent. Whereas previous generations did not know the harm they were causing, today we do. Governments have not yet shown the leadership necessary to limit and reduce fossil fuel consumption and accelerate the transition to a low-carbon economy.

Christ teaches us to love all our neighbours, not just our own family and friends. This love extends to grandchildren and future generations. Humans, made in God's image, have responsibility for the care of creation. If we do not act now, we are, in effect, asking future generations to sacrifice their well-being so that we can continue to live carbon-dependent lives.

The Ash Wednesday Declaration on 'Climate change and the purposes of God', signed by senior church leaders, acknowledges that runaway global warming would undermine food security, accelerate species extinctions, make human life impossible in many parts of the world, and burden future generations with severe and unjust ecological debts.<sup>4</sup> The Declaration highlights

how continuing to pollute the atmosphere, when we know the dangers, goes against God's will; that God grieves over the destruction of creation; and that repentance means finding immediate ways to address the danger. For our generation, reducing fossil fuel dependence has become essential to Christian discipleship.

The Church of England has adopted a carbon reduction target of 80% by 2050 (in keeping with the UK Government's emissions reduction objective) and an interim target of 42% by 2020. Human-induced climate change, mainly a result of burning fossil fuels, is occurring fast and will confront humanity with its greatest ever challenge. The earth is on a pathway to global warming well beyond the 2°C internationally agreed as the maximum possible if we are to avoid cataclysmic climate change.

As Christians, how can we hear the science and its implications and not act by realigning our investment strategies with a vision for a sustainable future?

... Unfortunately, fossil fuel companies currently show no evidence of their responsibilities regarding fossil fuel pollution. They continue to seek to maximize the return on their investments from exploiting existing reserves and seeking new sources of oil, gas and coal. We cannot afford to risk dependency on tar sands oil or other unconventional or extreme extraction methods.

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## A Franciscan Approach to Climate Change

by **Ríobart É. Breen, SFO Ph.D.,**

**FAN Research Analyst**



In concern for addressing climate change issues, people of faith have looked to their own various traditions to identify insights and wisdom to help create practical, concrete steps that will make a difference. Christians have looked to the Scriptures, and the Catholic Church has supplemented that effort with insights from its own theological and pastoral tradition. The Catholic Church has found tremendous insight within its own Franciscan heritage, and so contemporary Franciscans in particular are being called upon to draw deeply from the Franciscan Tradition to provide leadership in efforts to address Climate Change.

First, it is important to introduce subtle Franciscan nuances or orientations that are key to any Franciscan approach. For example, Franciscans embrace a fundamental "yes" to the intrinsic goodness of the created world – joy, hope and delight in simple beauty. This created world includes the social world of people, too. This emphasis makes a difference in an emerging climate change movement that can get bogged down with the ominous reality of negative impacts of the climate change crisis. This

is our Franciscan Incarnationality. Franciscans offer a vision that is deeply grounded in hope and joy because Creation and the unfolding of events are deeply permeated by the presence of the Living God, and we know that in a profound way. Franciscans also are eminently pragmatic and practical. We offer not only an intellectual, theological and philosophical reflection on the concept of Climate Change, but rather we continue through the process to consider insights from and implications for prayer life, liturgy, lifestyles, communities, ministries, and society, developing some practical action steps in response. This is our Franciscan sacramentality.

Franciscans also presume our kinship with Creation. There are other ways to consider human – nature relationships. Utilitarian approaches recognize that what we do to nature through environmental pollution and degradation, we do to ourselves. The stewardship approach sets humans at the top of the Creation hierarchy, and implores people to be responsible and considerate when they exercise dominion over Creation. Franciscans are much more humble and intimate in our outlook. We are to treat Creation as our brother and sister and mother, as members of our family. We are not in a position of power and control, but rather in a loving relationship of mutual concern and care for our family. Right relationship with Brother Wind, Sister Water and Mother Earth helps us to encounter God in Creation. Climate Change affects our family, and puts our entire family into harm's way.

Franciscans have had a centuries-old tradition of explicitly integrating science, and using science as a means of exploring and coming to know our created world. Knowing the science of ecology helps us to read the Book of Creation, and to know the Creator. Franciscans also emphasize *haeccitas* or "thisness," the unique specialness of each particular living and nonliving thing, loved individually and particularly by God. Every person, every tree, every pond, and every member of every species is uniquely special, is uniquely known and loved by God, and is uniquely imbued with the presence of God. Integrating Climate Change science into our considerations is essential for Franciscans, as is an understanding of the impacts of Climate Change on every individual creature that is part of the ecosocial system.

Perhaps the most important Franciscan aspect for Climate Change is the Franciscan conversion process. Franciscan penance is a person's process of conversion or transformation that results in a *metanoia*, or new way of seeing. This *metanoia* results in a new way of being, and a new way of living in right relationships in the world. This Franciscan conversion process is a deepening cycle; by changing the way a person sees Climate Change, there is a change in personal and community lifestyle that reduces Climate Change impacts, which in turn further changes the way the person sees Climate Change. This Franciscan conversion or transformation process attunes the person and the community to the presence of God in Creation, and brings people into a more intimate relationship with God.

The Franciscan conversion process relies on the Franciscan education or formation process, which is deeply rooted in our storytelling tradition. Franciscan storytelling helps in establishing or recovering people's identity, meaning and purpose rooted in

the Gospel. Franciscan conversion and formation using storytelling allow us to engage the full person—emotionally, intellectually, imaginatively, physically through the senses, and spiritually. As an example, imagine the Incarnation of tomorrow, with Jesus being born into a climate changed world. Born into poverty in a community of people struggling with unnatural drought, the Holy Family becomes environmental refugees. Joseph is not able to care for his family because they cannot find clean water, and the crops will not grow. The wood supply for his carpentry and their heating and energy source is no longer available, since trees and forests cannot survive the drought and wildfires. Joseph no longer has any meaningful work in which to engage to support his family in a dignified way. He moves his family to a refugee camp and takes handouts from first world charities. Periodic flash floods destroy the refugee camps, which routinely have to be rebuilt, keeping families in constant chaos mode. What kind of world will we be creating for babies, children and young families of a climate changed world? Will it be hospitable and allow all people to find their human dignity through human-nature relations? Or will the earth only be a source of suffering and poverty and charitable handouts from the wealthy? Franciscan storytelling can help us to get at new possibilities rooted in love, peace, justice, human dignity, service and sustainability.

The Franciscan Conversion process is essential today, because Climate Change is going to require a completely new way of living in relationship with Creation (including its fossil fuels, alternative energy, food and agriculture, and other natural resources), and most especially with our brothers and sisters in the developing world who are most impacted by negative effects of Climate Change. The Franciscan family has much to offer in a world hungry for a new direction and a new vision to help deal with the Climate Change crisis. For Franciscans, now is our time. At this critical moment, It is our privilege to serve God, Creation and humanity in a new way.

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### How fast can the world decarbonize to zero (virtual) carbon?



Most of the science scenarios are not for zero carbon and the zero carbon ones take more than 50 years to get to zero.

The only published ([Worldwatch 2009](#)) exception is Bill Hare's (Potsdam Climate Institute) 1 C limit plan that reaches zero carbon in 40 years.

The fastest rate contemplated is 25 years, but these proposals add years of delay to peaking of emissions.

Lester Brown's Plan B4 is the only one designed to prevent planetary catastrophe. It proposes an 80% cut in 10 years.

What is all important is how do we do it.

Solar photovoltaic can provide 100% world energy with 1% of world land  
[WWF 2013.](#)

### [Bill Hare The 1C Limit Plan.](#)

#### **1. STOP ALL ATMOSPHERIC GREENHOUSE GAS POLLUTION PROMOTING GOVERNMENT SUBSIDIES**

This investigation into the history and amount fossil fuel subsidies by Dr Peter Carter finds that world wide they are in the trillions of dollars. In 2013 the IMF published [a study](#) showing the fossil fuel subsidies are at least \$1.9 Trillion (an underestimate according to the IMF). A 2013 report on externalities by TRUCOST found GHG promoting are over \$3Trillion.

#### **James Hansen Sept 2013**

*Most remaining fossil fuel carbon is in coal and unconventional oil and gas.*

*Thus, it seems, humanity stands at a fork in the road. As conventional oil and gas are depleted, will we move to carbon-free energy and efficiency -- or to unconventional fossil fuels and coal?*

***It seems implausible that humanity will not alter its energy course as consequences of burning all fossil fuels become clearer Yet strong evidence about the dangers of human-made climate change have so far had little effect. Whether governments continue to be so foolhardy as to allow or encourage development of all fossil fuels may determine the fate of humanity”.***

Climate Sensitivity, Sea Level, and Atmospheric CO2 Philosophical Transaction Royal Society , 16 September 2013 J. Hansen, M. Sato, G. Russell and P. Kharecha  
NASA Goddard Institute for Space Studies and Columbia University Earth Institute,  
New York

**The choice is clear for humanity - emergency decarbonization or the literal end of the world.**

**[Stern Commission's 2006 Economics of Climate Change.](#)**

**Pricing carbon by Internalizing the full costs of carbon.**

**[Analysis of the US proposed Climate Protection Act 2013](#) [Citizens Climate Lobby \(US\)](#)  
Fee & dividend**

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**Stifling heat, anarchy, refugees: welcome to a post climate change world**

December 3, 2013



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### Political reporter



*Professor Ross Garnaut warns of the global political consequences of a rise in temperatures. Photo: Luis Ascui*

Living in Sydney by the end of the century will be like living in Rockhampton, subtropical Queensland, if global temperatures are allowed to rise by four degrees - the current trajectory of climate change.

Melbourne's climate will be akin to Griffith in regional NSW and Canberra will feel like outback Cobar.

Alice Springs will mirror modern-day Sudan, while Darwin will be like no other city on earth in 2100. The Top End would be virtually uninhabitable, with more than 300 days a year of 35-plus degree heat.

The downside to warmer winters on the eastern seaboard in 2100 is the prospect of "anarchy" in our region prompted by the dislocation of 250 million people from the Asia-Pacific, climate refugees who will need to be resettled in part in Australia.

The "profound" shift in living conditions as a result of climate change is raised in *Four Degrees of Global Warming: Australia in a hot world*, a compilation of climate science literature to be launched in Melbourne on Wednesday.

The book explores the dire changes that are likely to accompany four degrees of warming on 1990 levels, including Australia becoming reliant on food imports as a result of a 90 per cent decline in agricultural production in the Murray-Darling food bowl.

Other consequences include:

- 250,000 coastal properties inundated by rising sea levels at a total cost of \$63 billion
- 17,200 heat-related deaths a year - up from 5800 today
- Snow will disappear from all but the highest alpine peaks
- 250 million people in the Asia-Pacific will be displaced.



The mass exodus from low-lying Bangladesh and coastal cities of China, Indonesia and India poses perhaps the biggest challenge for Australia, which could face a wave of climate refugees on a scale that would dwarf the current asylum seeker crisis.

In a chapter written by Professor Ross Garnaut, the prospect of "anarchy" and the breakdown of nation states is raised.



"Warming of 4 degrees celsius and more would precipitate such large change in global politics as to force the reshaping of national boundaries," Garnaut writes. "It may lead to a small number of more effective states combating anarchy by absorbing others."

"The survival of states with anything like the current boundaries and roles would be one of the less likely eventualities."

Professor Garnaut believes there is "still a chance that global mitigation efforts will hold global warming to two degrees" as long as countries are willing to turn up to the Paris climate change conference in 2015, prepared to commit to deep emissions cuts post-2020.

The book's main author, Peter Christoff, an Associate Professor at Melbourne University said Australia would need to swap its five per cent emissions reduction target to 38 per cent within 10 years to keep warming under two degrees.

"It's inappropriate for us to wait for a global agreement. Delaying is going to be more costly and less efficient. There's no point in delay," he told Fairfax Media.

"We have about a decade."

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## **DECLARE THE GLOBAL CLIMATE CHANGE PLANETARY EMERGENCY**



At least since 2007 we know the only response is a planetary emergency response.

Yet incredibly there is only one researched proposed plan, which is [Plan B 4](#) by Lester Brown of [Earth Policy Institute](#). It is free on line with updates. This plan is an emergency response.

No other proposals are emergency responses, because they all take 50 years and more to stabilize atmospheric CO2.

We need a drastic global emergency response now for survival and we need to

prepare to respond to the environmental and populations health catastrophes that are now unavoidable because our already [committed](#) global climate change.

### **Fossil fuel elimination**

Though, for one example contraction and convergence is a popular approach- it is not an emergency response and it does not eliminate fossil fuels.

We have known for many years that the only carbon emissions response is a [zero carbon](#) response.

### **Conversion**

Conversion is the key. We must and can convert today's GHG polluting goods and services to alternatives that do not emit.

### **All GHGs**

We have known for many years we have several times more than enough zero carbon renewable energy available.

We know we must stop sources black carbon soot emissions (2nd only to CO2 to warming). We must stop sources of nitrous oxide emissions that lasts 115 years in the atmosphere. We must stop sources of methane that has increased in the atmosphere 2.5 times.

There are two general reasons for declaring an emergency and they both apply to an unprecedented extent right now in the case of global warming climate change:

- o Disaster will happen without immediate action with focused resources to prevent it.
- o Disaster is happening and is so severe for a population that only immediate action with focused multiple resources can mitigate severe suffering and loss of life to the population.

It is not realized that the declaration of a global climate planetary emergency is the first response to the global climate change crisis.

It goes without saying that we all need to reduce our carbon footprint and many organizations have been working on that for many years.

However life style changes cannot result in a zero carbon world so long as we remain dependent on fossil fuels for energy.

### **FIX THE PERVERSE ECONOMICS**

The cause of global climate change and ocean acidification is economic (market failures) and there can be no end to GHG pollution without correcting the

economics. As Lester Brown says our economics does not tell the economic truth. It is biased towards industrial activities that cause resource depletion and pollution.

### **Eliminate all GHG polluting subsidies**

The obvious first step (emergency or not) is to eliminate all subsidies to the GHG polluting industries. In the case of fossil fuels these amount to over a trillion dollars world wide. [Stop all fossil fuel subsidies](#) and switch the amount to aid the rapid development of clean zero carbon energy. The IMF finds fossil fuel subsidies world wide amount to \$1.9 trillion ([2013 report](#)).

The 2006 [Stern Commission report](#) provided the best brief list of measures for avoiding planetary catastrophe headed by *First put a price on price carbon*. The pricing method favoured by N Stern and most economists is the carbon tax. This does not preclude other measures like capping emissions with regulation and carbon trading, but only governments charging the polluter at source for the costs of pollution can reliably and rapidly shift investment money out of fossil fuels and into zero carbon renewables.

### **Correcting climate change market failure by internalizing the full externalized costs of GHG pollution.**

The Stern Commission report showed how the correction of the market failure that results in GHG emissions pollution can be corrected in accordance with modern market economics, by identifying the single root of cause of global climate change. Calling global climate change the greatest and most wide reaching market failure ever Stern said the externalized costs of carbon pollution can and must be internalized.

This principle applies to all GHG emissions.

The Commission advised three strands to policy: all are required.

*Policy to reduce emissions should be based on three essential elements:*

- *First, we must establish a carbon price via tax, trade and regulation – without this price there is no incentive to de-carbonize.*
- *Second, we must promote technology: through research and development. Further, private sector investors need confidence that there will be markets for their products: that is why deployment policy also makes sense.*
- *And third we must deal with market failure; for example problems in property and capital markets inhibit investments for energy-efficiency. Further, the sticks and carrots of incentives, rightly emphasized by we economists, need to be supported by information. And still further, greater understanding of the issues can itself change the behavior of individuals and firms.*

The Stern Commission report focused on CO<sub>2</sub> like most other climate change mitigation proposals, because CO<sub>2</sub> lasts so long in the atmosphere (20% 1000 years) that its impacts are practically irreversible and it has contributed most to global warming. However only changing CO emissions will not stabilize global temperature, because of other long lasting and very powerful GHG emissions.

The Stern Commission also referred to switching to a low carbon economy as most proposed plans do. This is far too vague for a carbon emissions goal and its practice is being used as a lower carbon economy that is far off a virtual zero economy.

## **ZERO/VIRTUAL ZERO CARBON AND LONG LASTING GHG EMISSIONS**

For fossil fuel CO<sub>2</sub> mitigation should be no big problem in correcting the market so that funds leave the fossil fuel industries for the clean zero carbon industries.

Fossil fuel subsidies have been calculated and are up to a two trillion dollars (or more). Externalized costs can be internalized because the socio-environmental costs are known (air, water pollution, and GHGs) and have been calculated. Recent calculations include some accounting for global climate change.

All long atmospheric lasting industrial greenhouse gas emissions must be stopped or virtually stopped. It is well established by carbon cycle and CO<sub>2</sub> science that [ONLY ZERO CARBON](#) emissions energy production and use can stabilize global temperature and for that matter ocean acidification.

The second IPCC assessment 1995 recorded that due to the extremely long life time of nitrous oxide (N<sub>2</sub>O 315 years) its emissions would have to be virtually eliminated like CO<sub>2</sub>. How ever this has been forgotten with all the attention being focused on CO<sub>2</sub>.

Though methane lasts in the atmosphere for 15 years it is still classified as a long lasting GHG because 15 years is a very long time for a methane emission to last with its much greater global warming effect (72X CO<sub>2</sub> over a 20 year period).

Some manufactured chemicals are such extremely powerful GHGs and so extremely last lasting that their emissions must be totally eliminated. This applied to the halocarbons and notably to sulfur hexafluoride (SF<sub>6</sub>) an industrial pollutant which is the most powerful long lasting of all GHGs.

While it is well established in the science that we must have zero carbon emissions there is no zero carbon policy proposal. Also we must have a zero long lasting GHG emissions plan but this is not recorded in the published science so is not being considered at all.

### **Zero carbon emissions plan**

Zero carbon emissions is what the science dictates and means no more carbon being added to the atmosphere by human activities.

The best we can do is virtual zero (usually meaning over a 90% global reduction) because just growing our food in the most climate friendly way has to emit some carbon. In order to meet climate science requirement of actual zero carbon some CO<sub>2</sub> must be extracted and secured from the atmosphere. In theory this can be done by increasing the natural carbon sink, developing artificial carbon sinks and by technology to remove CO<sub>2</sub> from the air. Nano technology has been suggested as another approach to remove CO<sub>2</sub> from the air. None of these have been developed past prototype.

**Virtual zero carbon emissions** means a total world wide **conversion** of all fossil fuel energy with clean zero carbon energy sources. Fossil fuel energy must be **replaced** by zero carbon energy. The present approach is to only reduce carbon intensity, or burn less fossil fuels more efficiently. This can never get near global zero carbon emissions and in fact allows the fossil fuel industry to keep developed nations fossil fuel dependent and keep globalizing fossil fuel energy, on the rationale that the highly polluting world manufacturing base in Asia will eventually reduce its pollution.

The same principles of conversion and replacement apply to the other long lasting GHG emissions.

### **Methane emissions**

Methane is the second or third global warming agent depending on the inclusion of black carbon.

Though it doesn't last as long as CO<sub>2</sub> in the atmosphere as CO<sub>2</sub> (15 years compared to 100 years) over a period of 20 years methane emissions have 72 times the global warming effect as CO<sub>2</sub>, so clearly methane emissions have to be stopped to stop the global temperature increasing.

Sources of methane emissions:

- livestock industry,
- paddy field rice production,
- land fills,
- fugitive (leaks) from natural gas, and
- fossil fuel combustion.

These can all be converted to non methane emitting goods and services. It is not as easy to full cost methane emissions as CO<sub>2</sub>. However because meat is an established cause of human disease this social cost of the largest source of methane emissions can be costed.

Methane and other non CO<sub>2</sub> gases that last less time in the atmosphere than CO<sub>2</sub> are being promoted as an easier and fast acting mitigation approach, while

governments continue to negotiate a treaty ( and delay action) on CO2 emissions.

In 2000 James Hansen published a paper [Global warming in the twenty-first century: An alternative scenario](#). In this paper he suggested rapid action on cutting non CO2 emissions of methane, tropospheric (ground level) ozone, halo carbons and black carbon. He pointed out that because a substantial part of fossil fuel CO2 warming is offset by fossil fuel air pollution cooling aerosols the sources of non CO2 emissions may have had a larger global warming effect that the science has estimated.

*"A common view is that the current global warming rate will continue or accelerate. But we argue that rapid warming in recent decades has been driven mainly by non-CO2 greenhouse gases (GHGs), such as chlorofluorocarbons, CH4, and N2O, not by the products of fossil fuel burning, CO2 and aerosols, the positive and negative climate forcings of which are partially offsetting. ... If sources of CH4 and O3 (ozone) precursors were reduced in the future, the change in climate forcing by non-CO2 GHGs in the next 50 years could be near zero. Combined with a reduction of black carbon emissions and plausible success in slowing CO2 emissions, this reduction of non-CO2 GHGs could lead to a decline in the rate of global warming, reducing the danger of dramatic climate change. Such a focus on air pollution has practical benefits that unite the interests of developed and developing countries (Global warming in the twenty-first century: An alternative scenario James Hansen PNAS 2000)."*

### **Nitrous oxide**

Though emissions of nitrous oxide have not caused as much global warming as CO2 or methane it an extremely powerful (290 X CO2) and extremely long lasting GHG (115 years), so emissions must be stopped to stabilize the global temperature.

The main source of nitrous oxide emissions agricultural use of nitrogen chemical fertilizer. It is also produced by the livestock industry and fossil fuel combustion.

Converting off fossil fuels and converting off meat eating would eliminate these two N2O sources and reinforces the urgent need for us to make these societal societies, that would both benefit our personal health by the way.

Farmers use far more chemical nitrogen fertilizer that is needed, so its use can be rapidly reduced. Converting off chemical fertilizers back to natural fertilizers in the only way forward on N2O emissions and the success of organic farming proves this can be done.

### **Tropospheric (ground level) ozone**

Ground level ozone is the well known air pollutant that is a respiratory tract toxin in minute amounts. It is another greenhouse formed as result of fossil fuel polluting chemicals reacting with sun light. As the temperature rises so does the amount of ground level ozone. It is mostly formed in the industrial Northern hemisphere. It is a short lasting GHG in the atmosphere.

A zero carbon switch off all fossil fuels will also eliminate this GHG, and clean up the air pollution.

It has an extra global warming feedback effect. Because it is toxic to green plants reducing their photosynthesis capacity of absorbing carbon from CO<sub>2</sub> in the air, an increase in tropospheric ozone will act as a feedback increasing the atmospheric CO<sub>2</sub>.

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## Is there a point at which adding more CO<sub>2</sub> will not cause further warming?

### From the Royal Society

No. Adding more CO<sub>2</sub> to the atmosphere will cause surface temperatures to continue to increase. As the atmospheric concentrations of CO<sub>2</sub> increase, the addition of extra CO<sub>2</sub> becomes progressively less effective at trapping Earth's energy, but surface temperature will still rise.

Our understanding of the physics by which CO<sub>2</sub> affects Earth's energy balance is confirmed by laboratory measurements, as well as by detailed satellite and surface observations of the emission and absorption of infrared energy by the atmosphere. Greenhouse gases absorb some of the infrared energy that Earth emits in so-called bands of stronger absorption that occur at certain wavelengths. Different gases absorb energy at different wavelengths. CO<sub>2</sub> has its strongest heat-trapping band centred at a wavelength of 15 micrometres (millionths of a metre), with wings that spread out a few micrometres on either side. There are also many weaker absorption bands. As CO<sub>2</sub> concentrations increase, the absorption at the centre of the strong band is already so intense that it plays little role in causing additional warming. However, more energy is absorbed in the weaker bands and in the wings of the strong band, causing the surface and lower atmosphere to warm further.

