

Notes on Climate Change

David Hallowes

The crisis deepens

Where we are now

The earth is now 1°C hotter than it was before 1850. This already looks dangerous:

- The weather is wilder – more droughts and floods and the rain comes late or early.
- The sea level is rising because the sea is warmer and ice is melting from mountains, and from Greenland and the Antarctic.
- The seas are also more acid which threatens the marine food chain and fisheries.
- In 2012: 400,000 climate deaths a year + 4.5 million bad air deaths;
- 700,000 Climate deaths a year by 2030; 200 million in Africa by 2100.

It's
hotter
than you
think

Data:
1880-present: NOAA data set.
1750-1880: Mann, Zhang et al,
IPNAS 105:14152-57;
M. Mann pers. comm.

1880
(1880-1909 baseline)

1750 pre-industrial
(1750-1779 baseline)

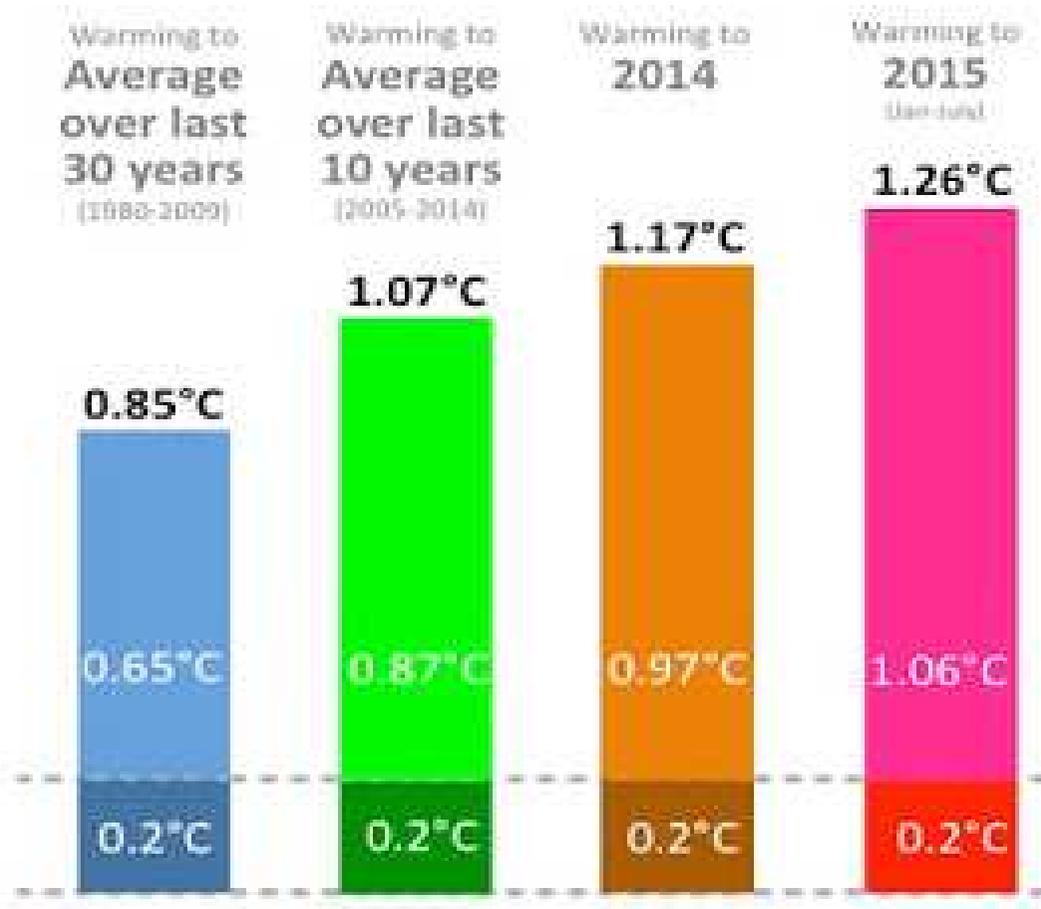


CHART BY DAVID SPRATT, AUGUST 2015

Some extreme events in 2015

- Drought California, Sao Paulo,
- Drought KZN + FS, Mp + Sthrn Africa
- Flooding Sthrn Africa in Feb.
- Indonesia burning.
- Mexico typhoon
- PhilippinesTyphoon
- California floods stripping scorched earth.

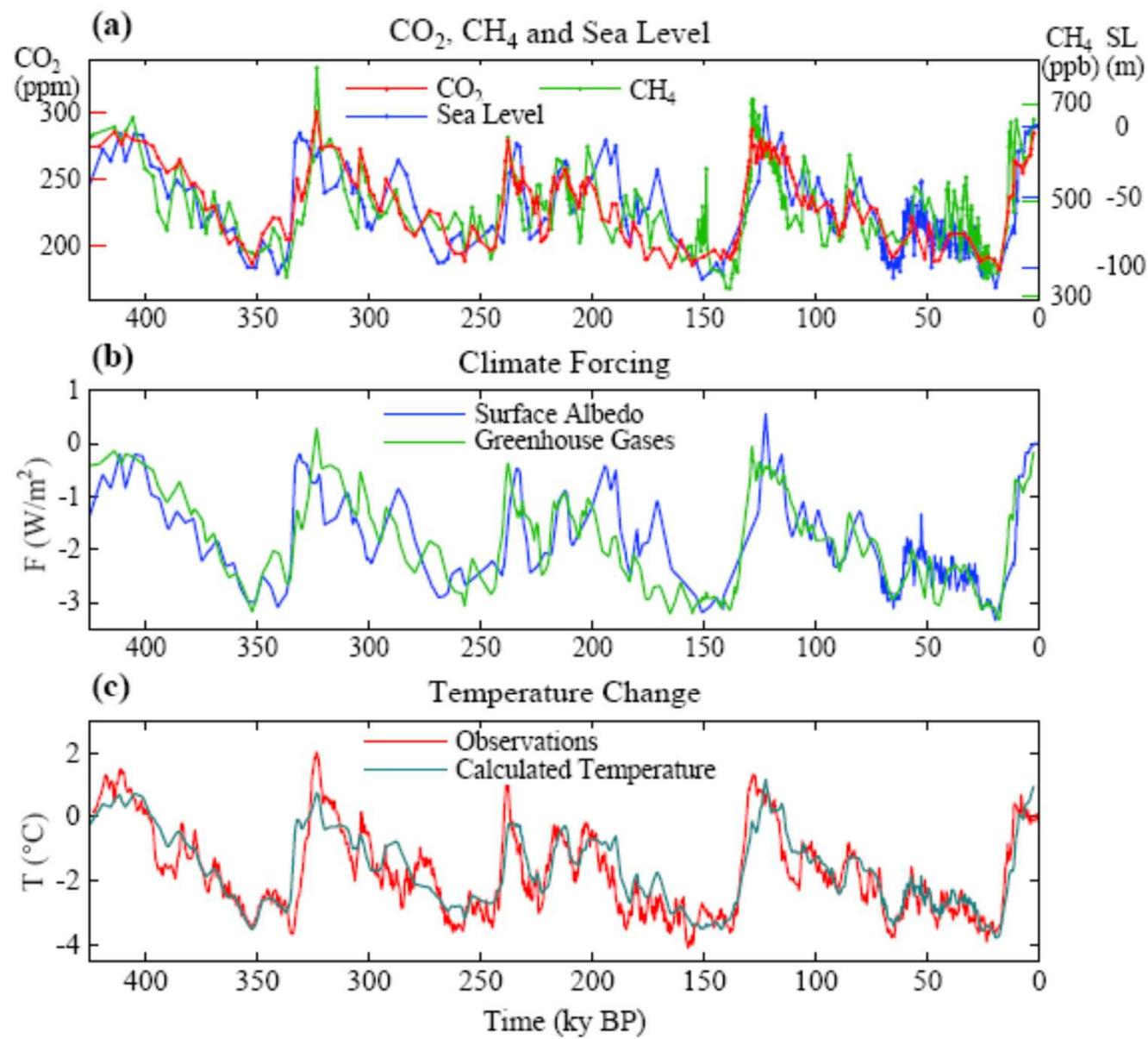




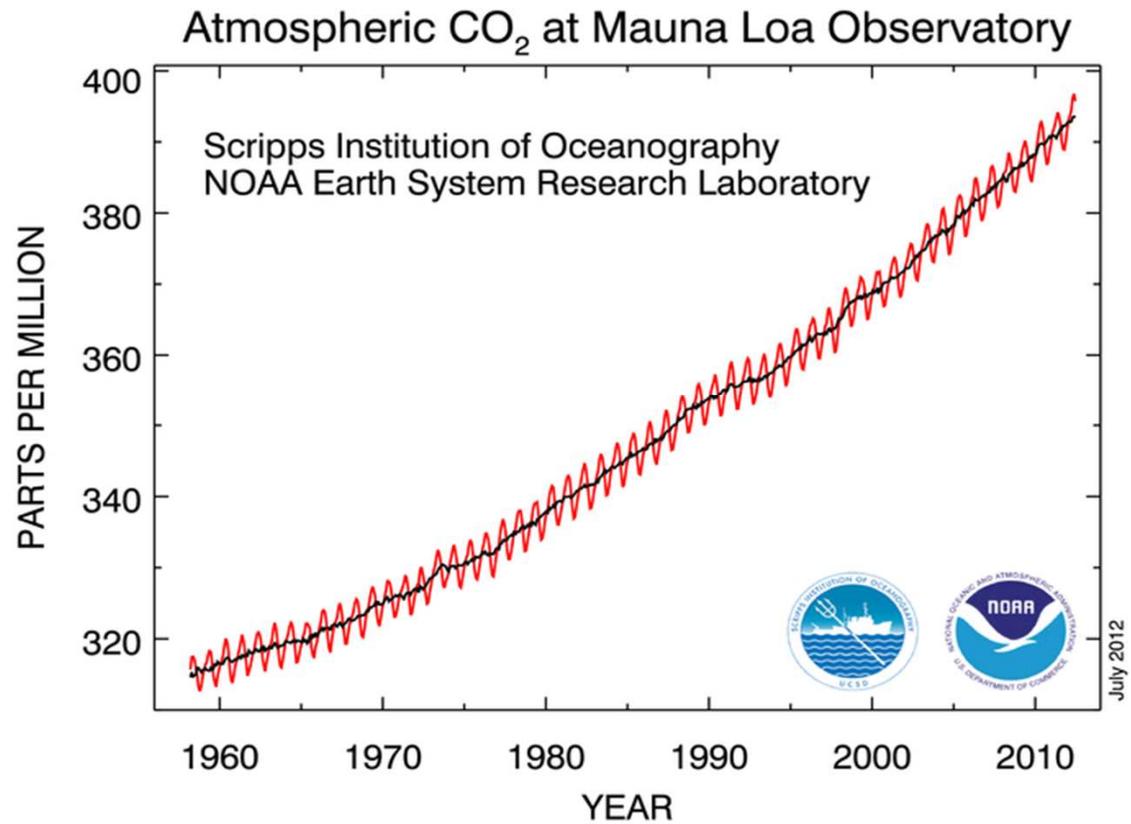
Greenhouse gases

Climate change is caused by the increased concentration of greenhouse gases (GHGs) in the atmosphere:

- Carbon dioxide (CO₂) is the main GHG. Methane is the second most important.
- Over the last million years, the normal concentration is between 180 and 280 ppm



Rising CO2 levels – hitting 400ppm



How much we can use

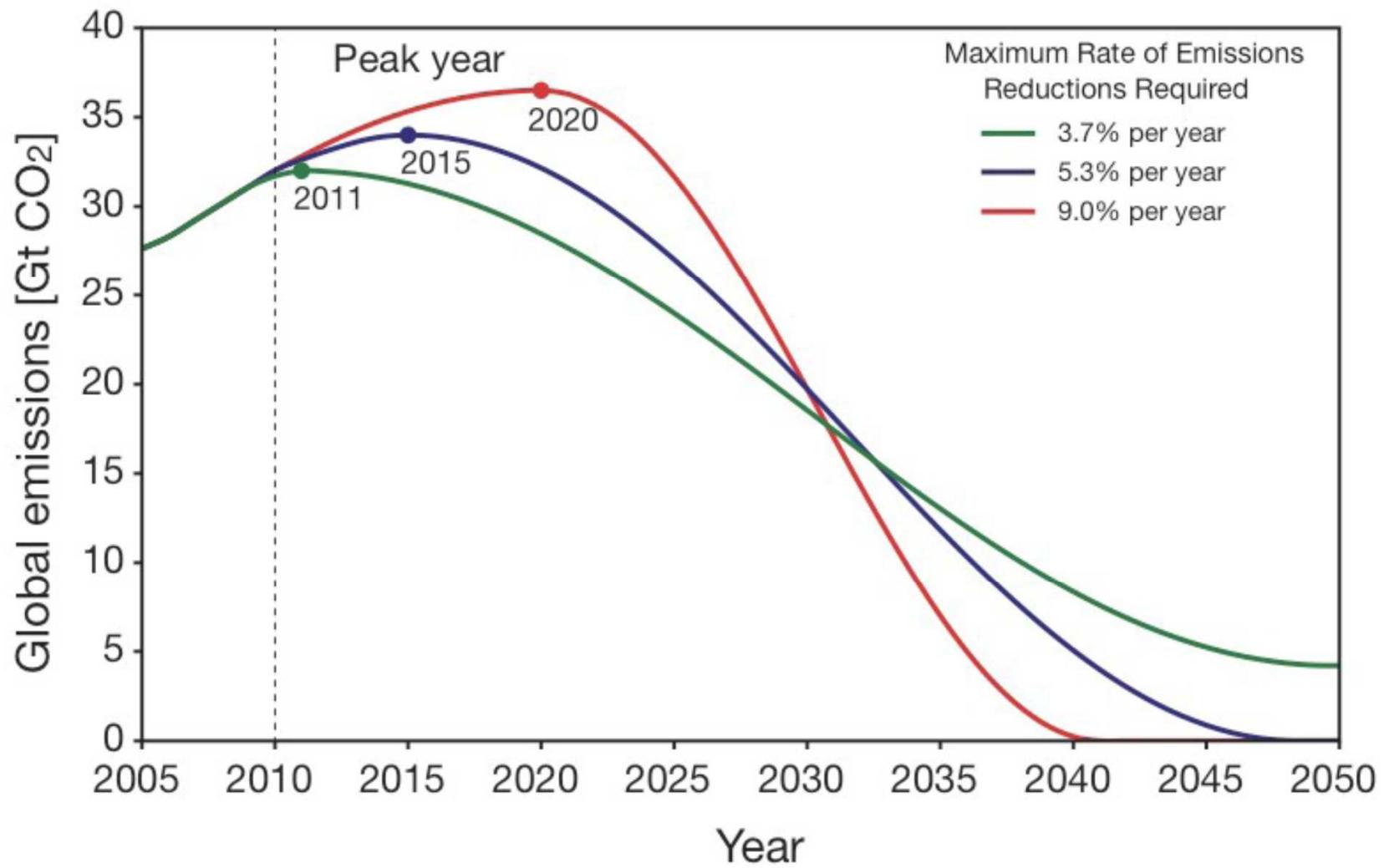
- Fossil fuel reserves v carbon budget
- Global coal, oil & gas reserves: 2,860 Gt CO₂

- For a half (50%) chance of coming in under 1.5°C, the global emissions budget is about 600 billion tonnes of carbon dioxide (Gt CO₂) from 2011 onwards.
- The same budget gives a two-in-three (66%) chance of coming in under 2°C.
- This budget is being consumed at the rate of over 35 Gt CO₂ per year.
- For all greenhouse gases, the budget from 2011 is about 900 Gt CO₂e.
- This is being consumed at about 50 Gt per year.

- NOTE: IPCC AR5 gives a range: 530 – 1300 Gt for 2011 to 2050. We take the lower end of the range for RCP2.6 for two reasons:
- first, to allow for climate feedback
- second, because the IPCC relies on the untested assumption that large scale “negative emissions” (i.e. sinks are greater than emissions) can be achieved in the second half of the century.

2014 (actual)		2025	2030
52.7 Gt	UNFCCC INDC trajectory	55.2 Gt	56.7 Gt
	Least cost trajectory	45.4 Gt	42.5 Gt
	Gap	9.8 Gt	14.2 Gt
	UNEP trajectory without –ve emissions	39 Gt	36 Gt
	Gap	16 Gt	21 Gt

- UNFCCC – peak 2030 and then 3% decline
- Anderson – peak 2020 and 10% decline rate from 2025



Where we are heading

At Cancun, most countries made pledges to reduce emissions or reduce the rate of increase in emissions.

- If they keep their promises, the temperature will rise 4°C by 2100.
- If they don't keep their promises and emissions keep rising at present rates, the temperature will rise by 6°C by 2100.
- Temperatures in SA rise at twice the average.

(The last 'ice age' was 5°C colder than the pre-industrial temperature.)

+ feedbacks 1

The 'carbon budget' looks at the warming created by GHGs only. But '+ve feedbacks' are now kicking in. Here are some of the main ones:

- The oceans absorb a large part of the CO₂ emitted every year but are reaching saturation so they now absorb less. That leaves more in the atmosphere.
- Tropical forests also absorb large quantities of CO₂. But some are getting dryer as well as hotter and deforestation increases their vulnerability. Indonesia now has uncontrolled fires every year.

+ feedbacks 2

- Ice is white and reflect heat back into space. Arctic sea ice is now melting fast every summer and the dark sea absorbs heat instead of reflecting it.
- Frozen peat wetlands (called permafrost) in the north of Russia, Canada and Alaska are beginning to melt. They contain massive quantities of CO₂ and methane which is now bubbling up.
- This accelerated with a heat wave and wild fires across the arctic in July 2013.

Negotiations

There is no 'carbon space' left. Catastrophic climate change can be avoided only by steeply reducing CO2 emissions starting now. The imperial countries should reduce first because they emitted first. Over the last century, the USA emitted 4 times more than China. But China's annual emissions are now highest.

US & China

CO2 emissions for China and the U.S., 1900-2007
total fossil fuel emissions in million metric tons of carbon



Negotiations 2

Countries are concerned about the climate but they are more concerned about their place in capitalism's pecking order. So:

- The North demands that the South reduce emissions from production
- The South demands that the North reduce consumption

But the North consumes what the South produces – so neither side wants what it demands. What they want is a dysfunctional climate regime.

1	2	3	4	5	6	7	8
	Country	2009 emissions Gt CO ₂	2008-2009 % change	2008 GDP US\$/ CO ₂ t	2009 CO ₂ t /per person	2009 Consumption Gt CO ₂	2004 net imp / exp Gt CO ₂
	World	30.389	-0.3				
1	China	7.711	+13.3	435	5.7	5.187	-1.147
2	USA	5.425	-7.0	2,291	17.2	5.699	+0.699
	EU	4.310		3,712	8.1	4.822	
3	India	1.602	+8.7	579	1.6	1.563	-0.100
4	Russia	1.572	-7.4	632	11.0	1.240	-0.286
5	Japan	1.098	-9.7	3,374	8.7	1.291	+0.284
6	Germany	0.766	-7.0	3,621	8.9	1.008	+0.233
7	Canada	0.541	-9.6	2,348	15.2	0.559	
8	S. Korea	0.528	+1.2	2,003	10.6	0.517	
9	Iran	0.527	+3.2	476	8.2		
10	UK	0.520	-7.8	4,284	7.7	0.672	+0.253
11	Saudi Arabia	0.470	+3.2	935	16.1		
12	South Africa	0.450	-6.7	622	10.0		-0.140
148	Mozambique	0.0023	+4.6	3,538	0.11		
165	Malawi	0.0013	+4.6	2,998	0.07		

False solutions

Governments can't ignore climate change but, as long as they are tied to the interests of corporate capital, they can't seriously address it. They therefore put forward false solutions:

- Carbon markets were created by the Kyoto Protocol. They created many carbon profiteers but no reduction in emissions. The markets have now crashed. Despite evident failure, they remain the first choice strategy of the world's elites.
- Carbon capture and storage (CCS): separate CO₂ from the rest of a power station's exhaust, compress it to a liquid and inject it under the earth. This is meant to make coal look clean but doing it at the scale required would need an infrastructure several times bigger than the global oil infrastructure.

False solutions

- Nuclear energy does not emit CO₂ from the generating plant but the full cycle of production is both energy and carbon intensive. Besides, no-one knows what to do with nuclear waste. It's also fabulously expensive – the fast road to national bankruptcy.
- Geo-engineering: proposals for 'solar radiation management' include pumping SO₂ into the upper atmosphere. Two big problems: if ever you stop pumping, earth will warm incredibly fast; SO₂ aerosols fall to earth and add to the acidity that is killing oceans and soils.

Restoring earth

Fossil fuels fired up the growth economies required by imperial capitalism. These economies created extraordinary wealth on the one side and untold misery particularly in the colonies, the 3rd World, the South.

They also created an ever more toxic world from pollution and from the more than 144,000 chemicals in commercial use. Poor people bear the brunt of pollution just as they will be hit first and worst by climate change.

- Survival depends on the failure of the economic and political elite
- If capital is terminated in the struggles that intensify over the next decades, what will be the base, to succeed the corporation, for organising production and doing so democratically and without laying waste to the planet?

Organising principle of economy

- Instead of GDP growth -
- Sustainable development founded on economic, social and environmental justice.

- Resist (the power of the MEC)
- Organise
- Transform

Renewables for people's power

We need a steep reduction in CO2 emissions which means:

- Reduce overall energy use
- Produce energy for people, not for profit
- Build renewable energy and phase out coal as fast as possible
- RE must be socially-owned so that it is not tied to the market's growth imperative.

Food for people and climate

- Food is the most basic form of energy for people. Chemical farming depletes the carbon content in soils. Organic farming puts it back. This is essential both for healthy food and as part of a genuine solution to climate change.
- PLUS drive big herds onto the dry savannah to restore the grasslands (it's the grazing regime that matters).

Cochabamba

In 2010, the People's Conference on Climate Change in Cochabamba, Bolivia, declared that:

- Rather than 'living better' as consumers of more things got 'at the cost of others and of nature', everyone should be able to 'live well' with each other and with the earth. "We are all part of Mother Earth, an indivisible, living community of interrelated and interdependent beings with a common destiny."