

InnoTeP

26 September 2014

Ton Runneboom

CO₂

Global Warming

Climate Change Sea level

Sustainability

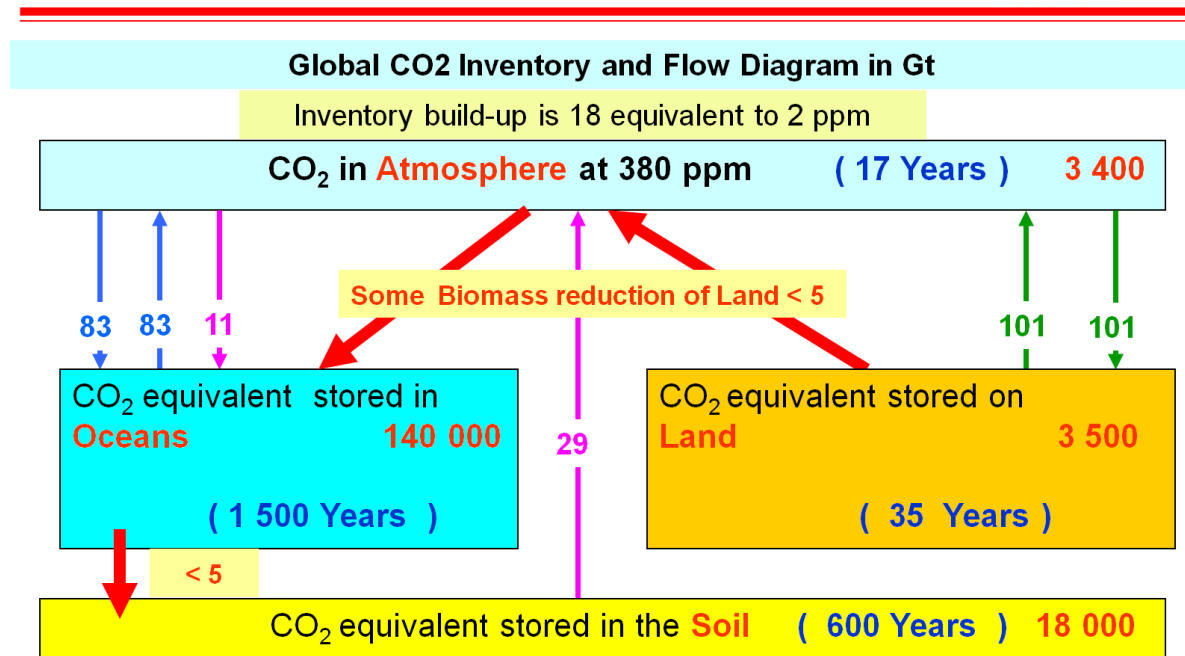
Bio Based Economy ?

I was based in Tokyo and convinced Teijin to invest heavily in bio-based products and felt the need to do our own analysis ! Heat balance to analyze heat not a CO2 balance.

An industrial perspective to the issues

- Flow charts
- Mass balances
- Numbers
- Observations based on above

CO2



- Love to see CO₂ going to Land
- All CO₂ ends up in the oceans
- Process is very inefficient
- Why not directly into the oceans to avoid side effects of warming ??

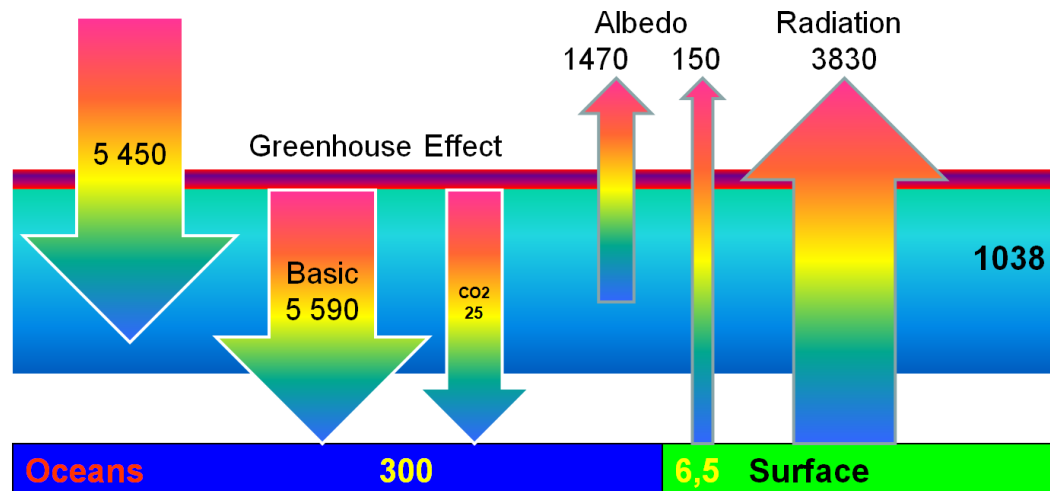
Gobal Warming

Global Heat Balance



Solar Input and Greenhouse effect

Solar input per year 5 450 Zjoule 1



- Atmosphere is very delicate as it hardly contains heat
- Albedo not effected by CO2

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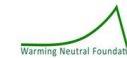
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Global Warming

Global Heat Balance

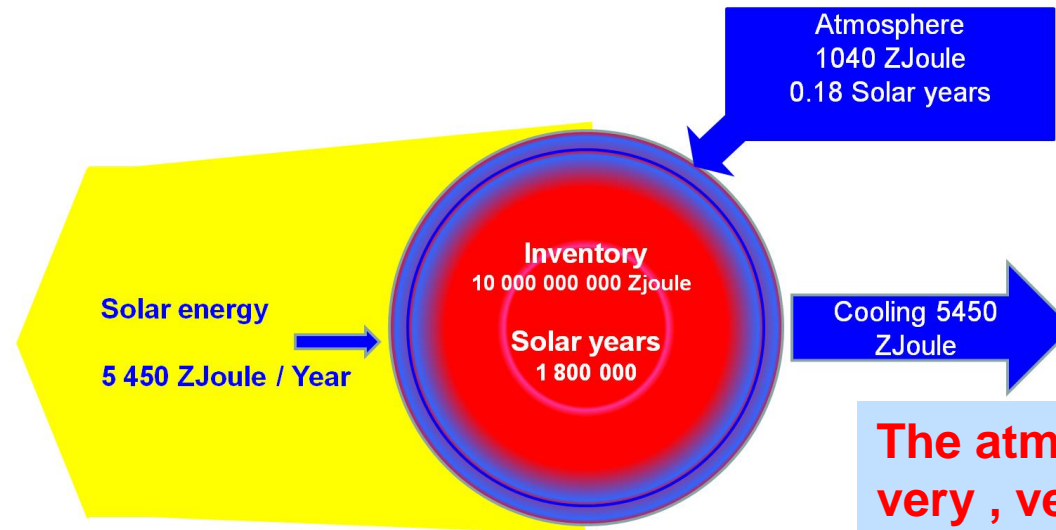


Earth receives
1/ 2billion th of the sun's
output

Any time of the day
difference between high
and low temperature in
atmosphere is at least
75 degree

Daily changes in one
location up to 40 degree

Still puzzled about temp
measurement system



**The atmosphere is
very , very delicate
and sensitive**

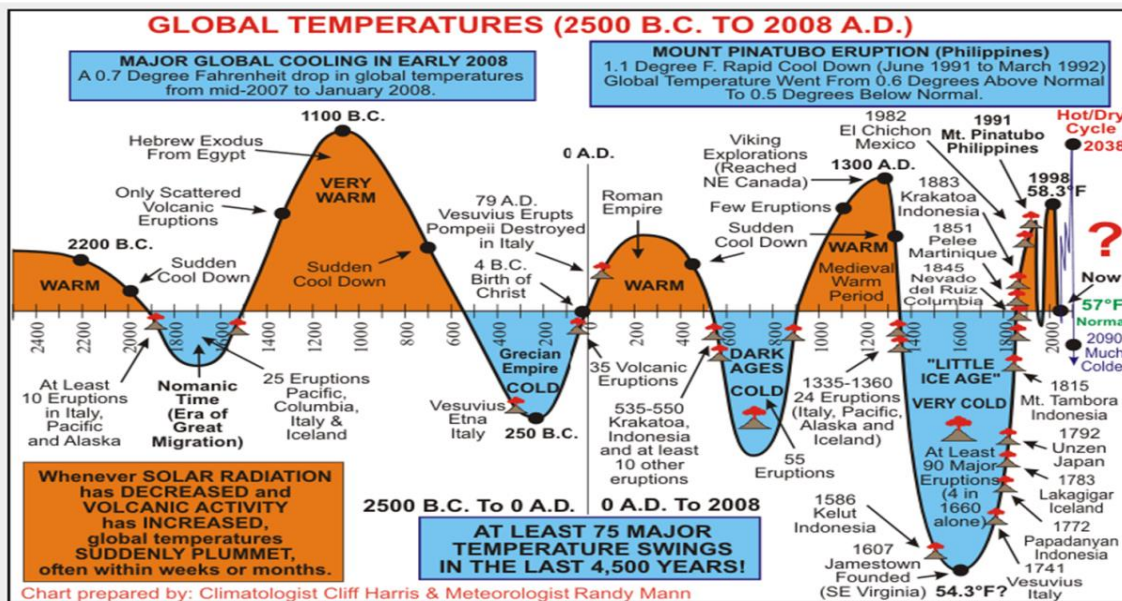
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IPPC Global Warming

Global Heat Balance



CO2 did not play a role until the industrialization

Observe the middle ages

Volcanic activity and solar activity

When CO2 is back to normal
..still warming and cooling cycles ?

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IPCC Global Warming

Global Heat Balance



Solar Irradiance	shortwave heat	345 Watt / M2
Radiative Forcings up to 230 PPM CO2 plus watervapour	longwave	345 Watt / M2
Radiative Forcings		
Solar Irradiance variance	shortwave	-/+1.4 Watt /M2
Volcanic Activity	shortwave	-0. 4 Watt / M2
Aerosols	shortwave	- 0.4 Watt / M2
GHG from 230 to 380 PPM CO2	longwave	+1.6 Watt / M2
Total fossile heat creation	longwave	+0,01 Watt / M2
Major assumption in IPCC shortwave and longwave radiatiave forcings have the same effect		

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IPCC talks about
Probabilities

2 Degrees means
+/- 450 ppm CO2
+/- 2 Watt / M2

Shortwave //
Longwave equal ?

If a house gets too warm

- Lower the heating system
- Increase the cooling ..open a window etc

Why not think in the same way about our climate ?

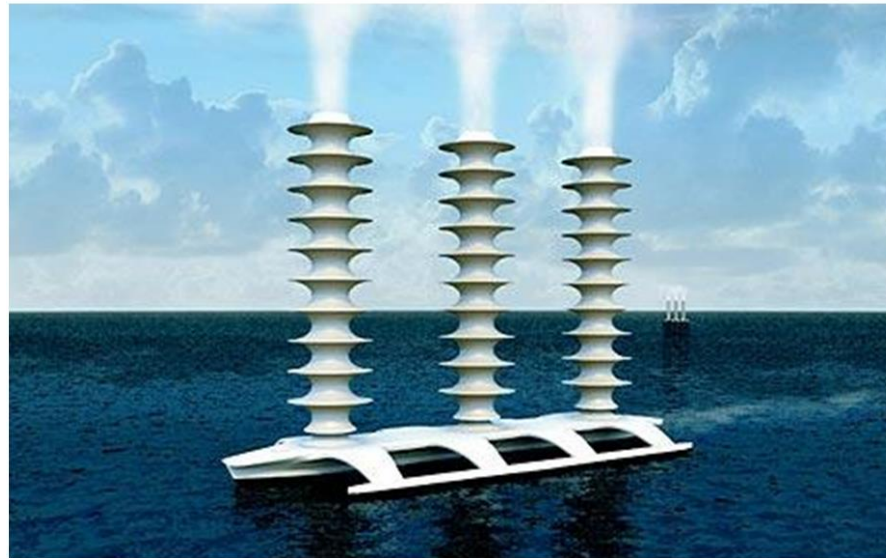
Alternatives Global Warming

Reducing heat
intake though
controlled clouds
formation

Increasing
Albedo effect

Published: 7:58AM BST 07 Aug 2009

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The unmanned ships would be directed by satellite to areas with the best conditions for increasing cloud cover

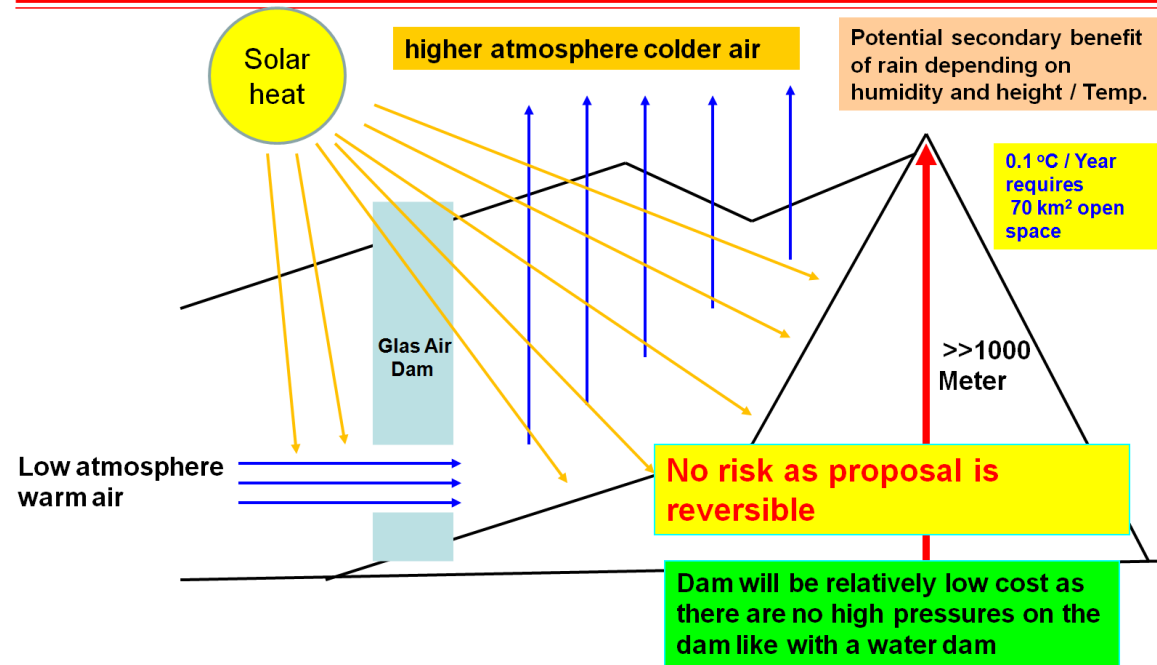
Alternatives Global Warming

Global Heat Balance



Cooling
Through chimney
effect

Valleys directed
to the south are
preferred



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Climate Change Sea level

Sea level Ratio between water / Ice on Land

Concentrate on preventing the ice to melt and keep it on land we are looking for the business opportunity to build dikes

Sustainability

The strength of Sustainability is that

We do not need to agree on

CO2

Global Warming

IPCC probability

Climate Change

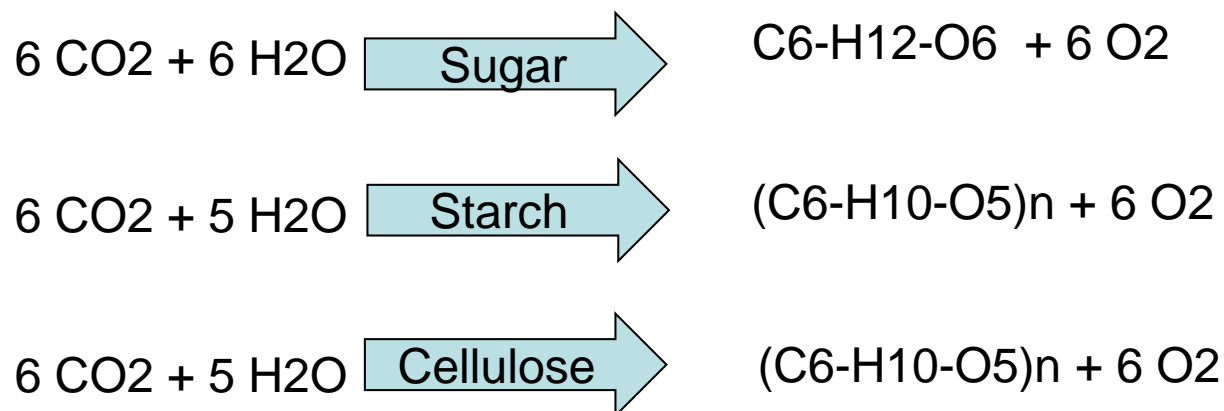
To have a consensus about sustainability concerning society /
economy

..... each individual has his / her own reasons / visions

..... his / her own set of individual goals

Thank you

Photosynthesis



Only +/- 1 % of solar energy is converted to Bio Mass energy
Solar PV cells and wind will do 30 % or more

In a free market PV and Wind will beat BioMass for electricity generation....
BioMass will beat PV and Wind for Food / Feed and material applications....