
THE GLOBAL HEAT SUPPLY / DEMAND BALANCE

AND

THE GLOBAL HEAT INVENTORY AND FLOW ANALYSIS

Ton Runneboom

Warming Neutral Foundation

Laan van Beek en Royen 41

3701 AK Zeist

The Netherlands

Gordon Feller

Urban Age Institute

870 Estancia

San Rafael CA 94903

USA

If you want to manage the CO₂ in the atmosphere ..

**Make a global CO₂ Supply / Demand balance
and**

Analyze the Inventories and Flows of CO₂

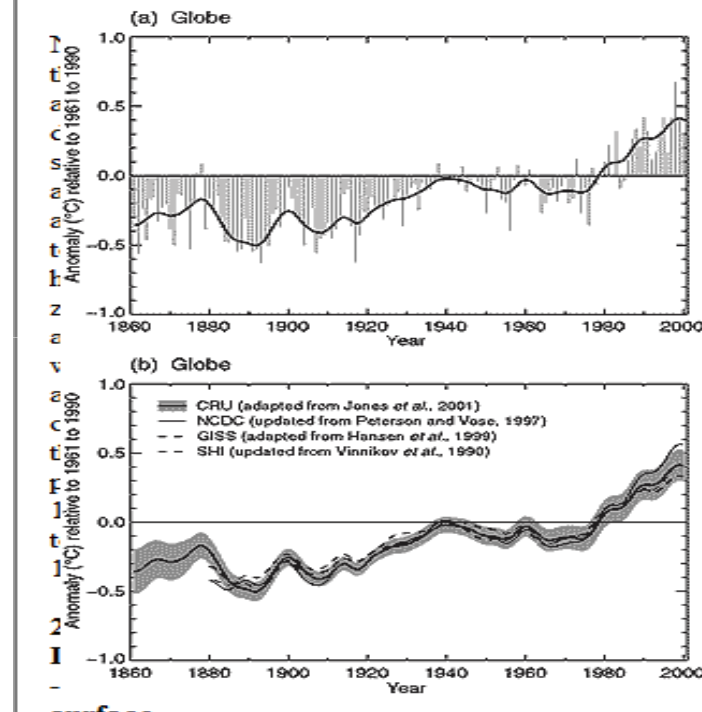
If you want to manage global warming in the atmosphere ...

**Make a global Heat Supply / Demand balance
and**

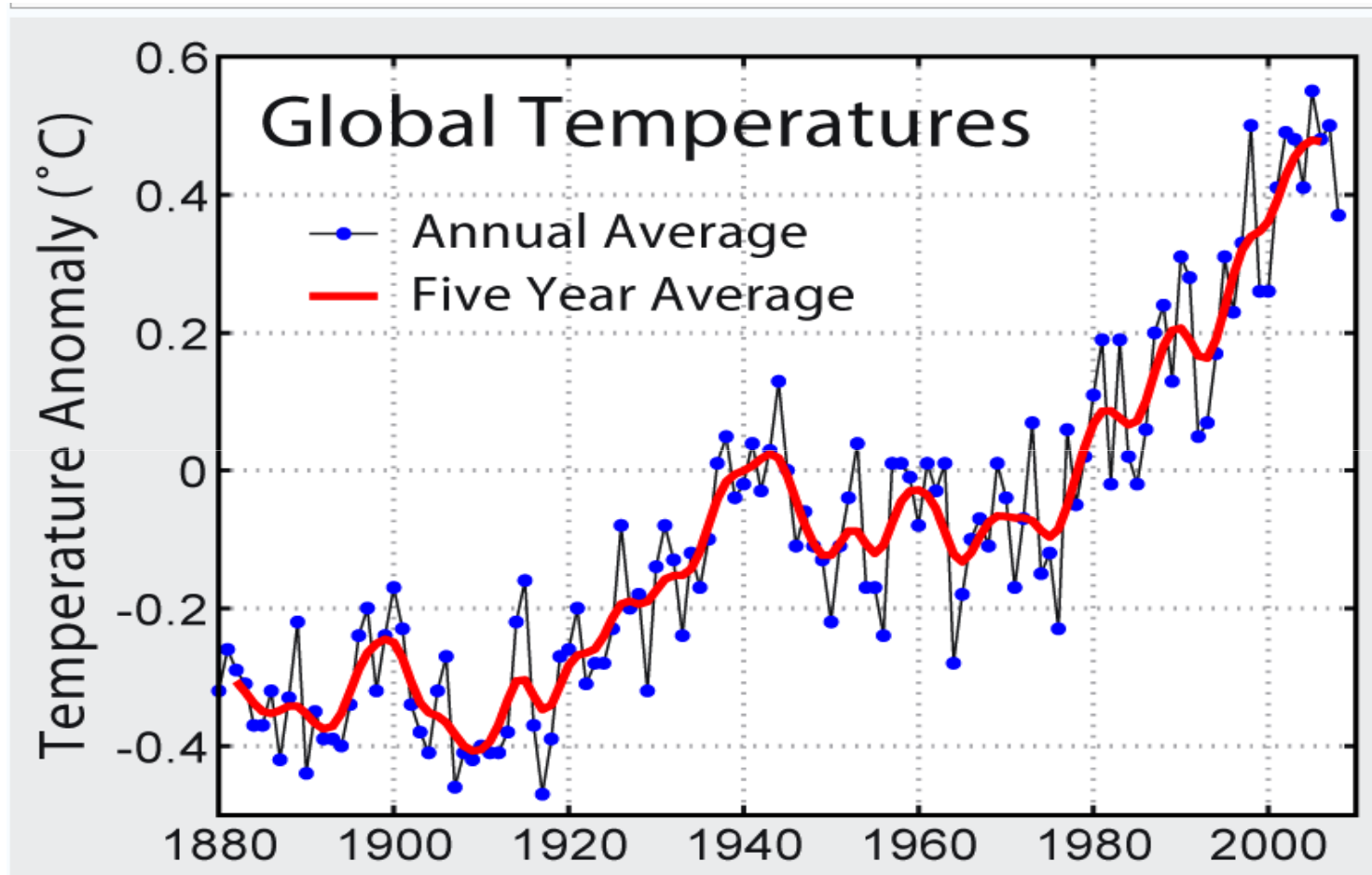
Analyze the Inventories and Flows of Heat

Global Heat Balance

2.2.2 Temperature in the Instrumental Record for Land and Oceans



Global Heat Balance

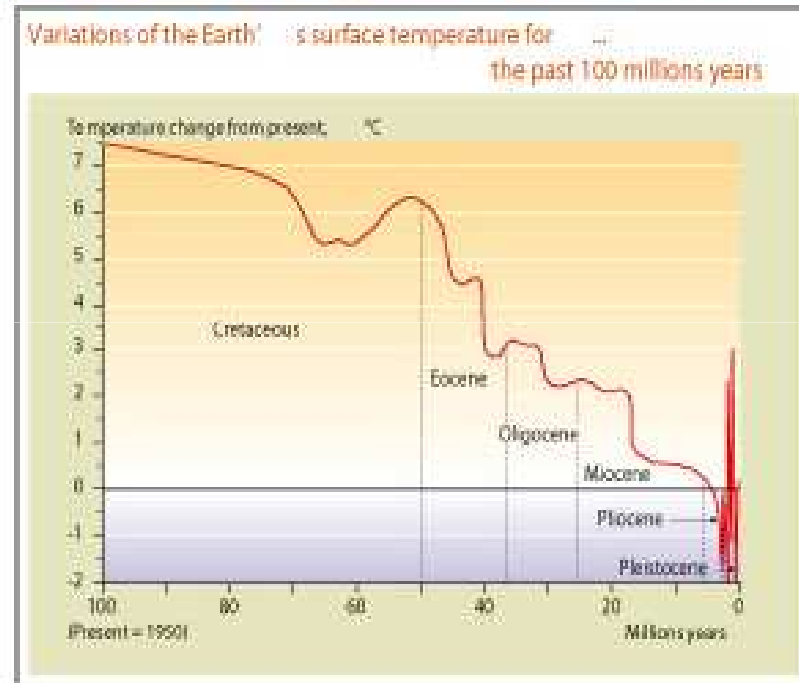


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[Instrumental_Temperature_Record.png](#) (800 × 591 pixels, file size: 39 KB, MIME type: image/png)

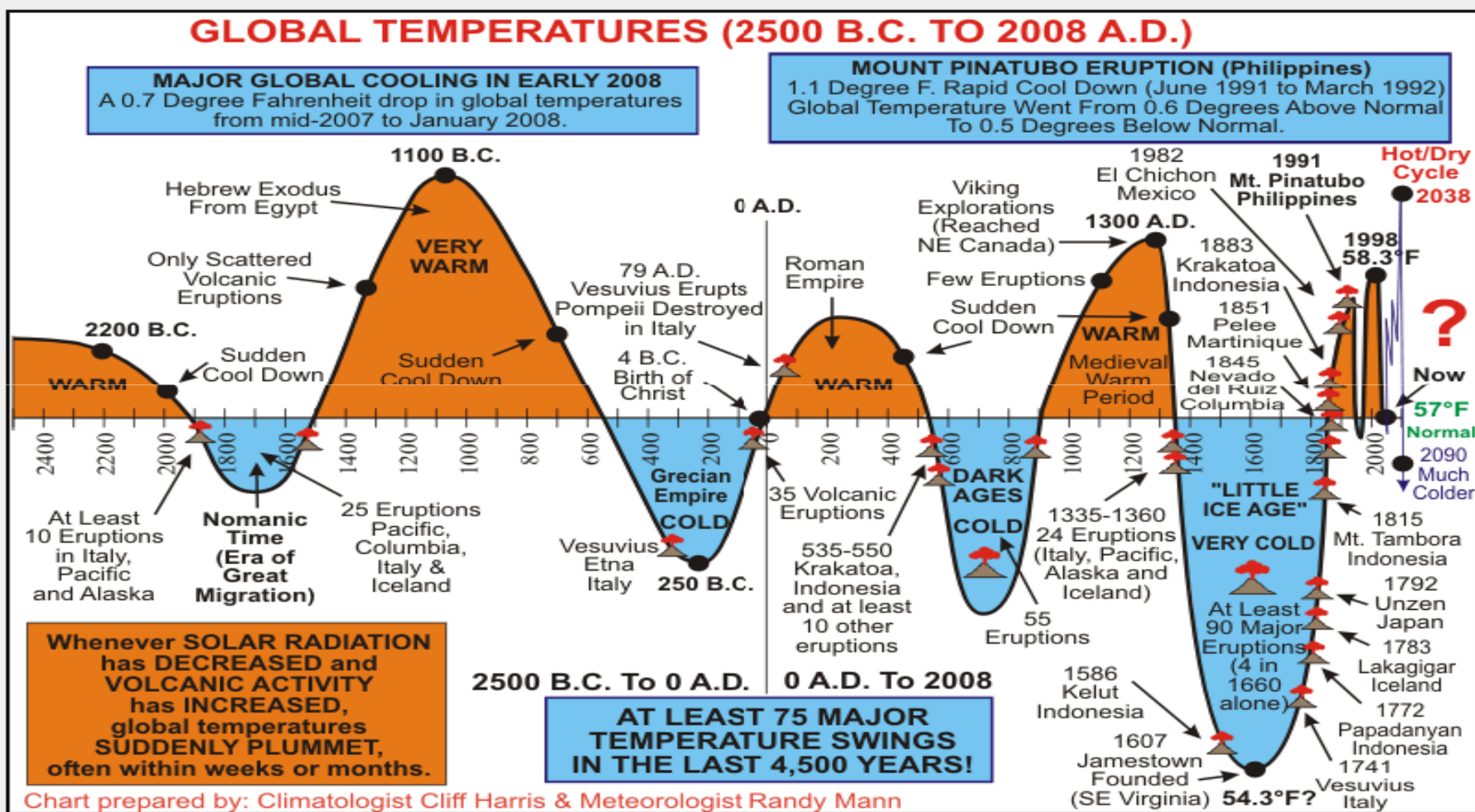
More information and download links below the graphic.

Variations of the Earth's surface temperature for the past 100 millions years

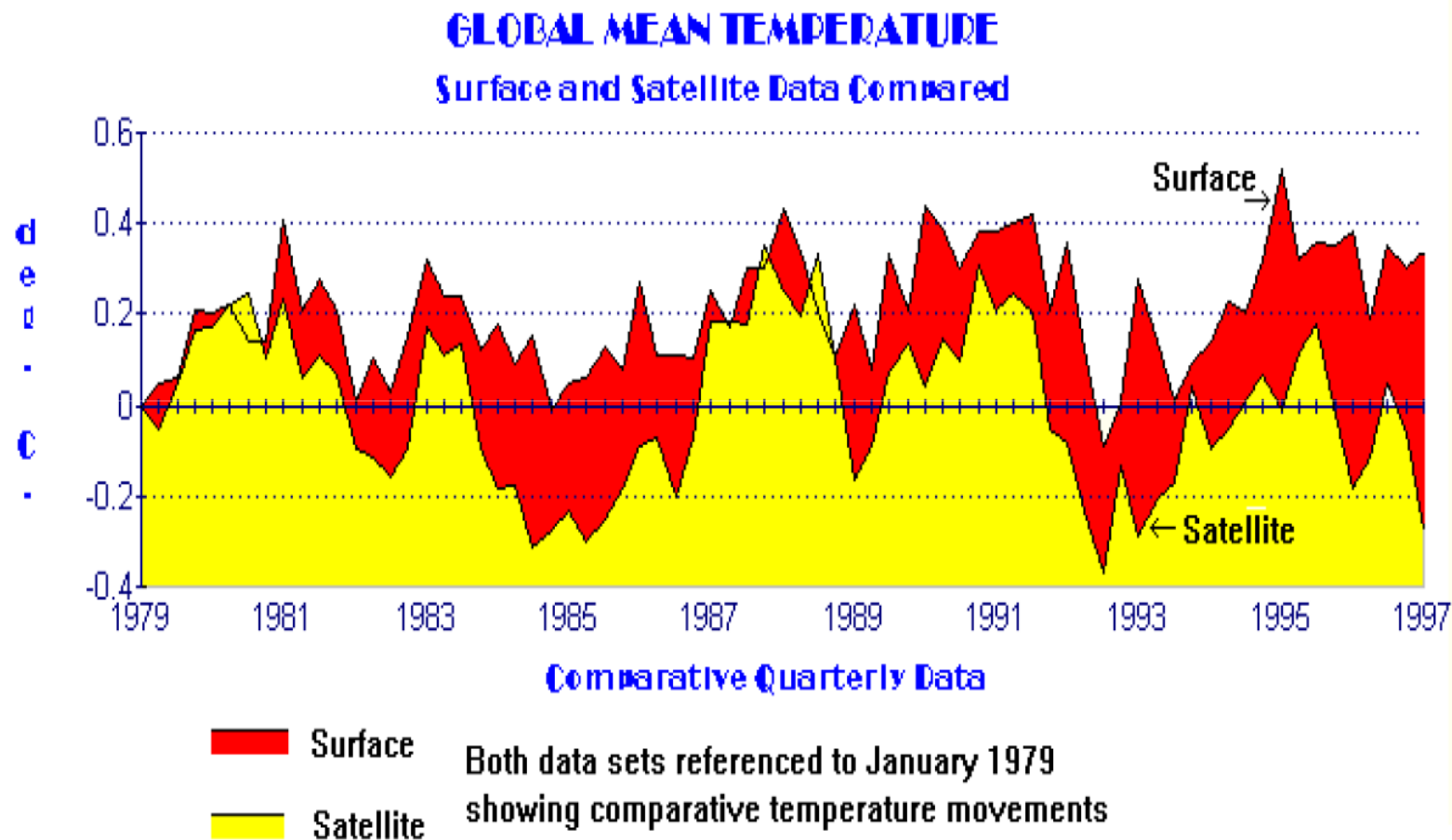


Variations of the Earth's surface temperature for the past 100 millions years. The global average surface temperature has increased over the 20th century by about 0.6 degrees Celsius. This increase in temperature is likely to have been the largest for any century in the last 1000 years.

Global Heat Balance



Global Heat Balance



There are many opinions of where we are in the cycle , where it will go next or whether the measurements are accurate

However when believing in global warming

Global warming is within a range of up to 0.2 °C or °K temperature increase in one year in the lower part of the Atmosphere

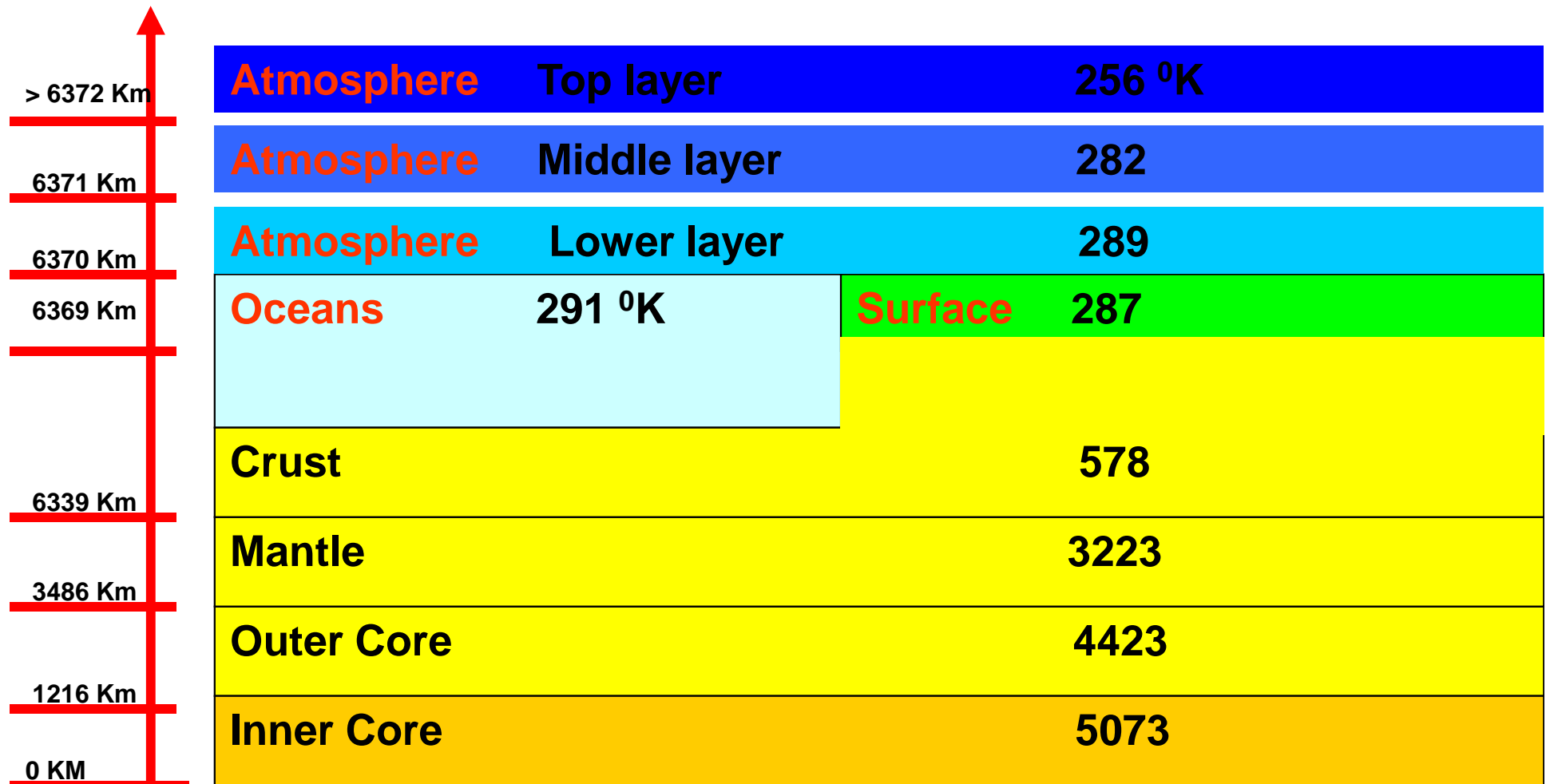
Formal policy is to limit to 0.2 degree in 10 years. Copenhagen limit < 2 degree end of 21st century

Global warming problems could be solved in case there was a cooling mechanism found to lower the temperature in the lower part of the atmosphere

Global Heat Balance



Heat Storage Areas Average Temperature in °K

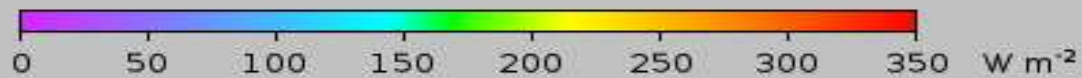
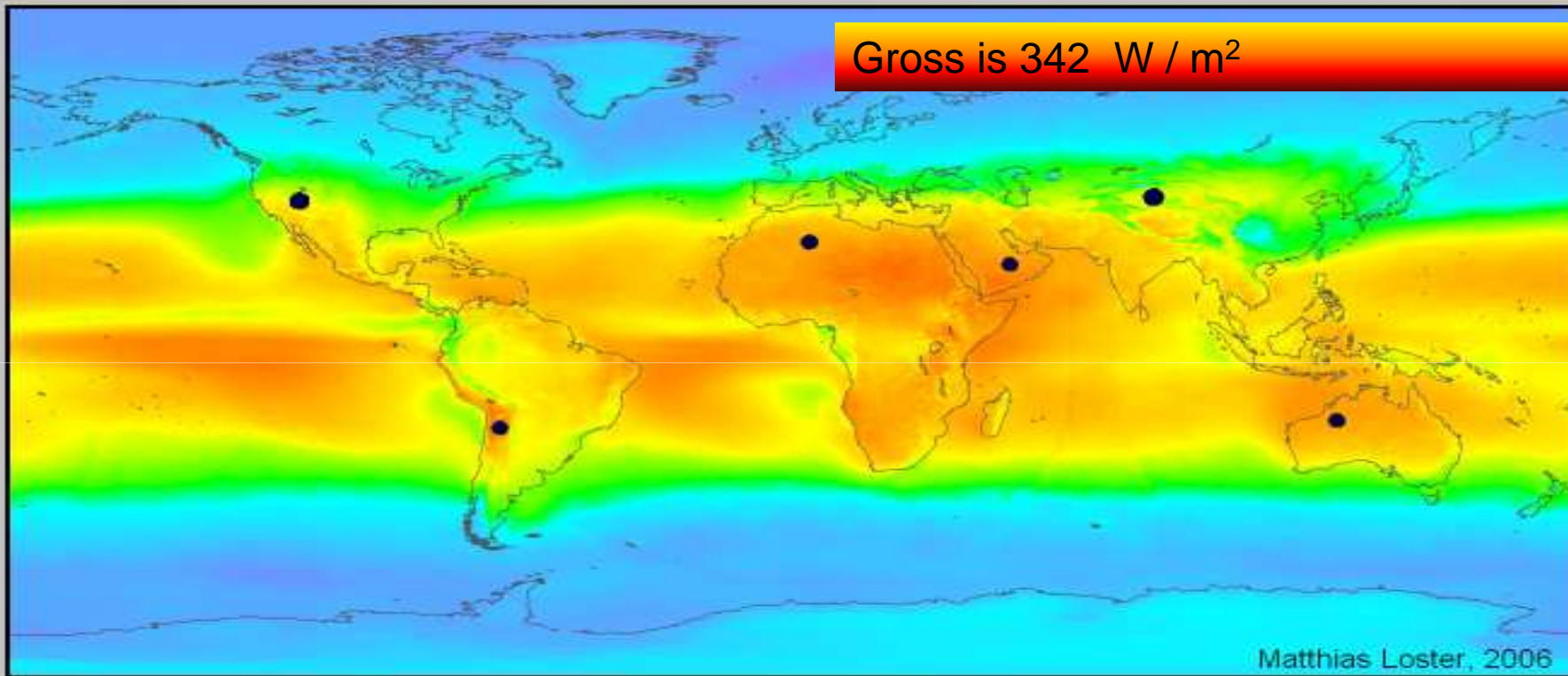


Global Heat Balance

Averages day / Night and including clouds

Average on land is 240 W / m^2

Gross is 342 W / m^2

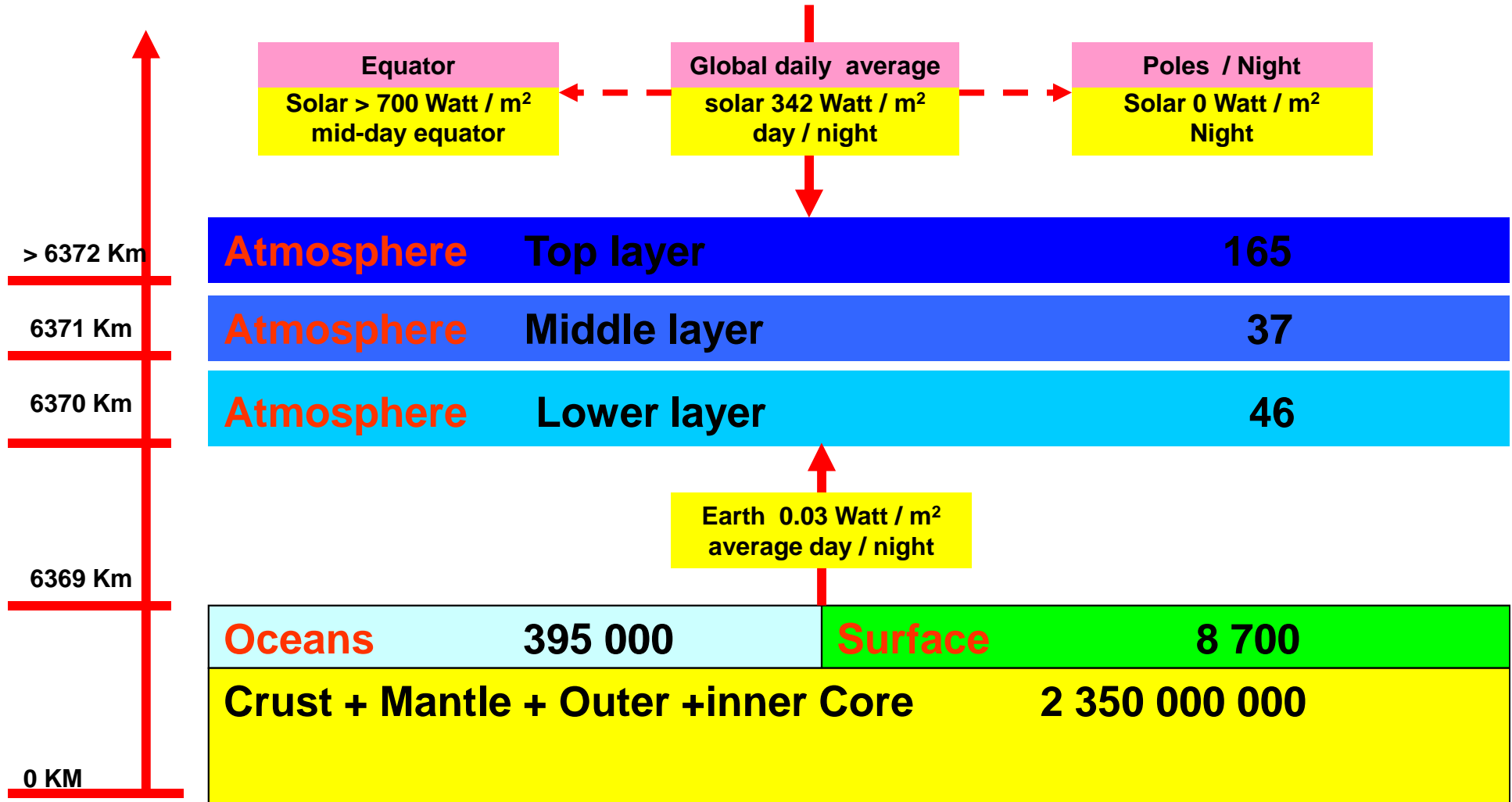


$\Sigma \bullet = 18 \text{ TWe}$

Global Heat Balance

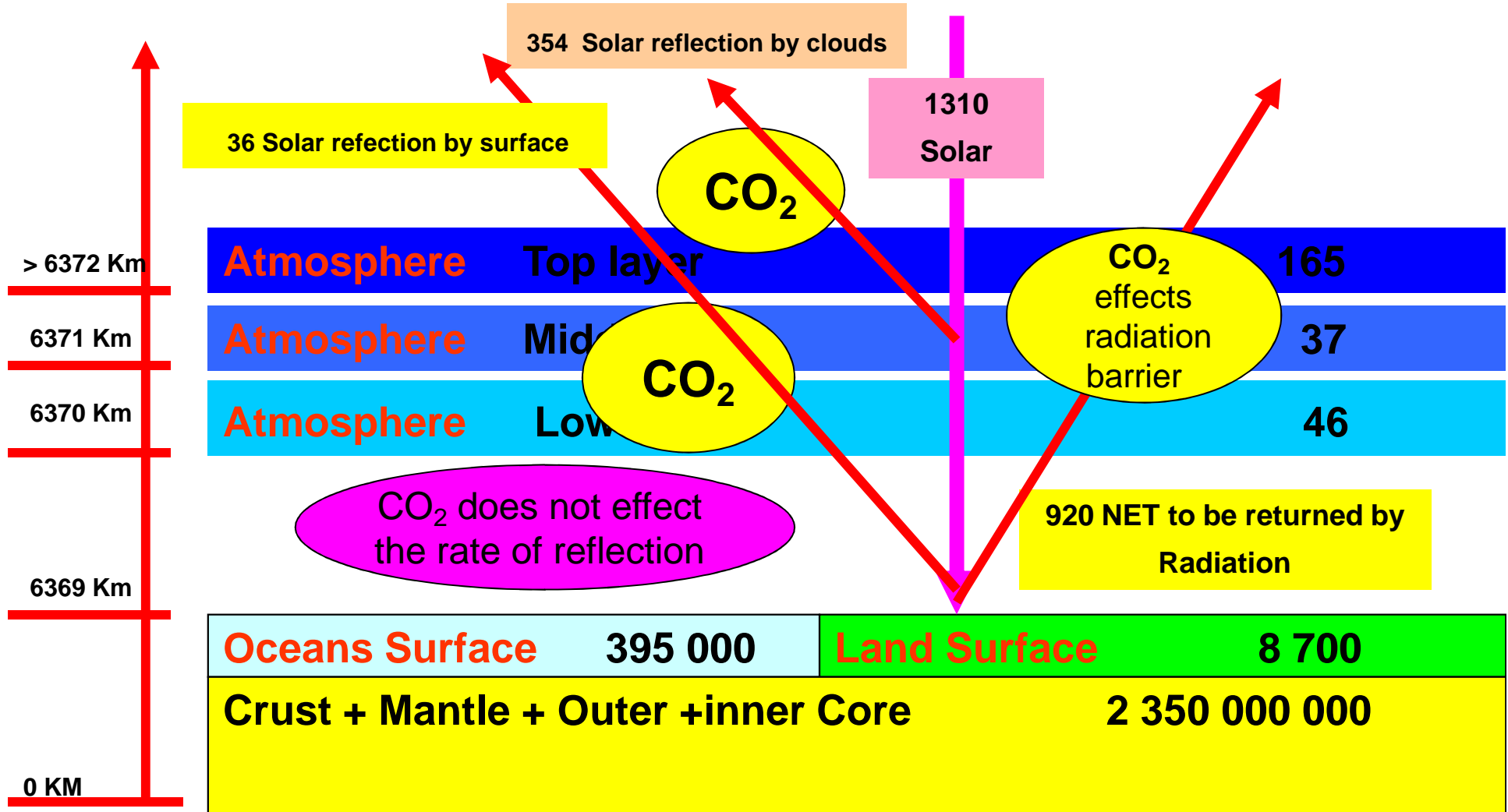


Heat Content and daily variations of Intensity of Flow ...



Global Heat Balance

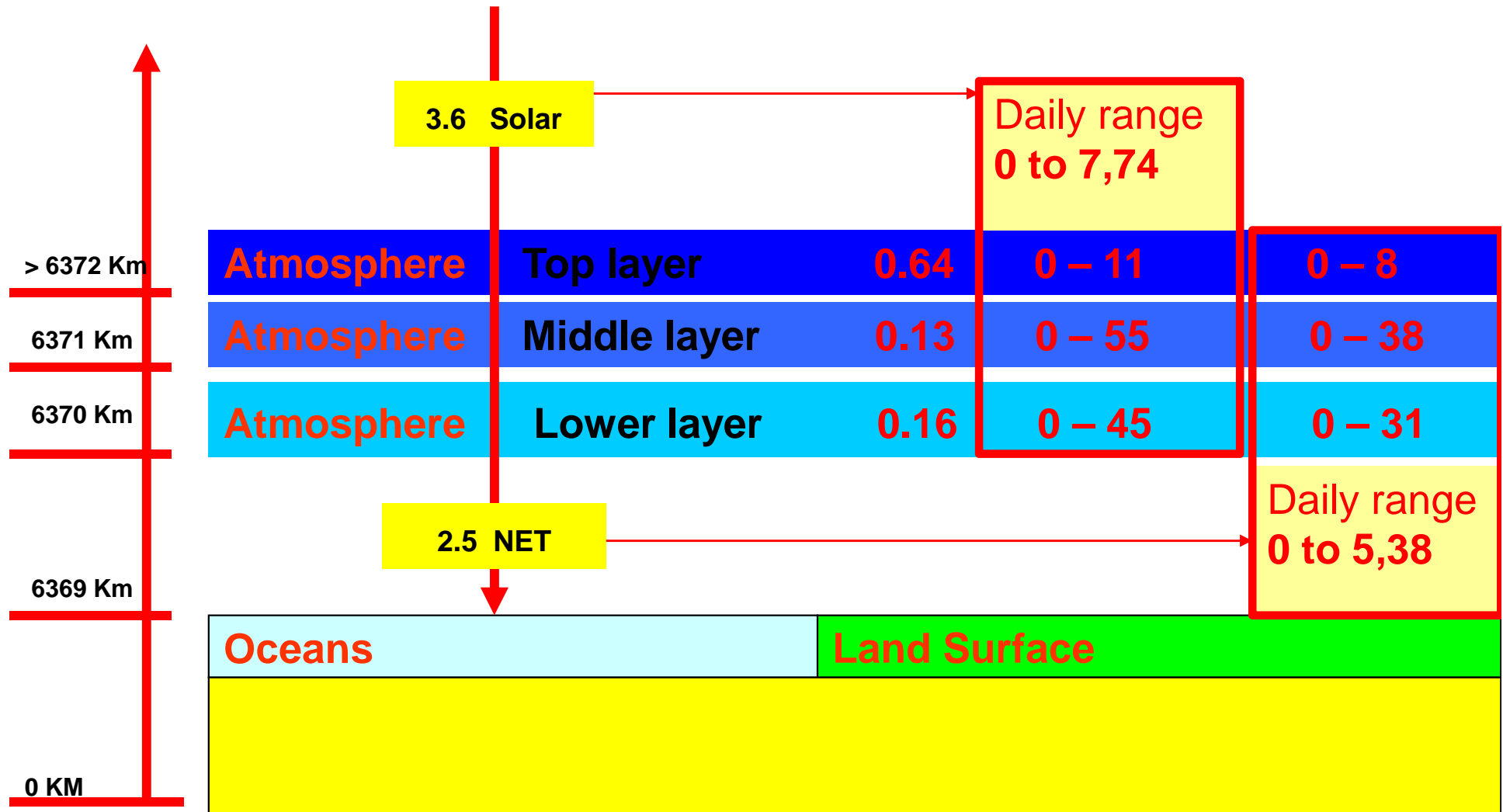
Heat Content and Flow / Year in Zcal // Zcal / year



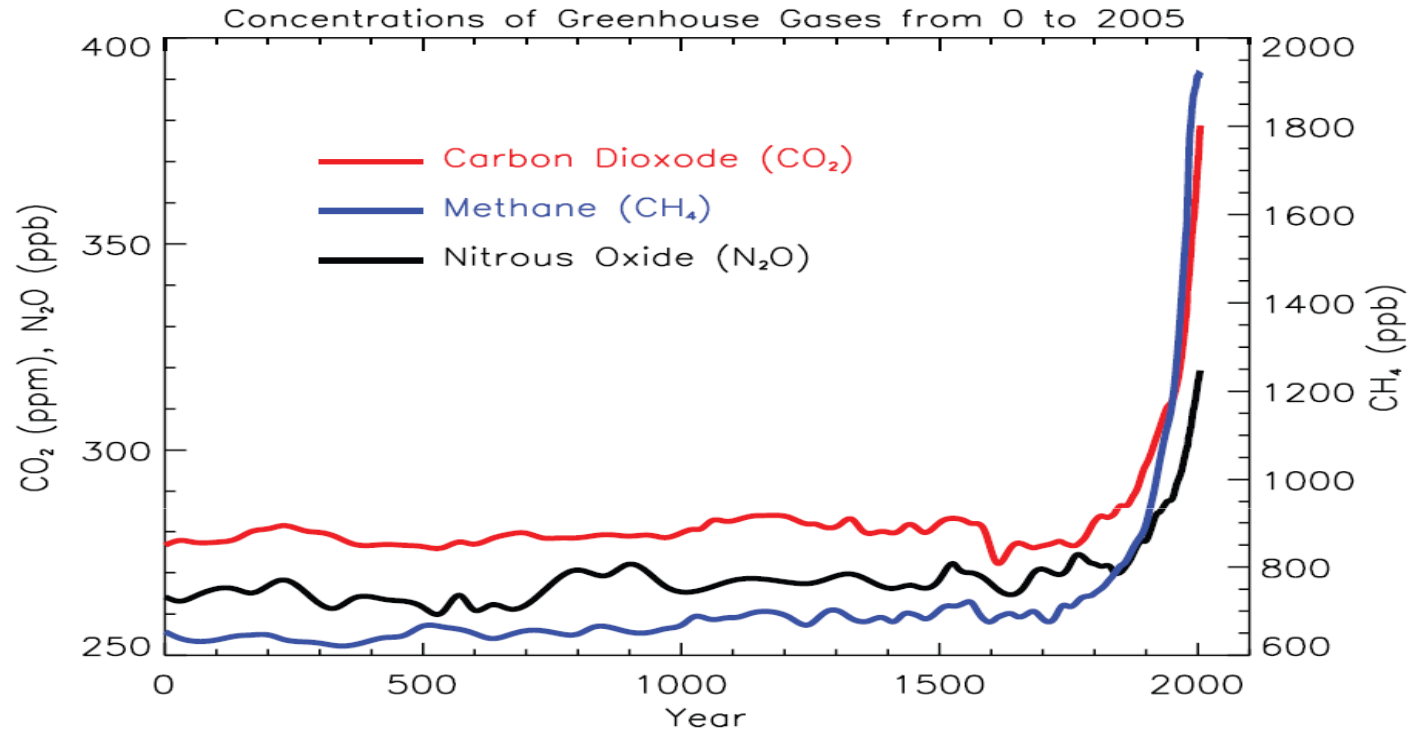
Global Heat Balance



Heat required to increase one degree in Zcal and Temp range / Day in degree C

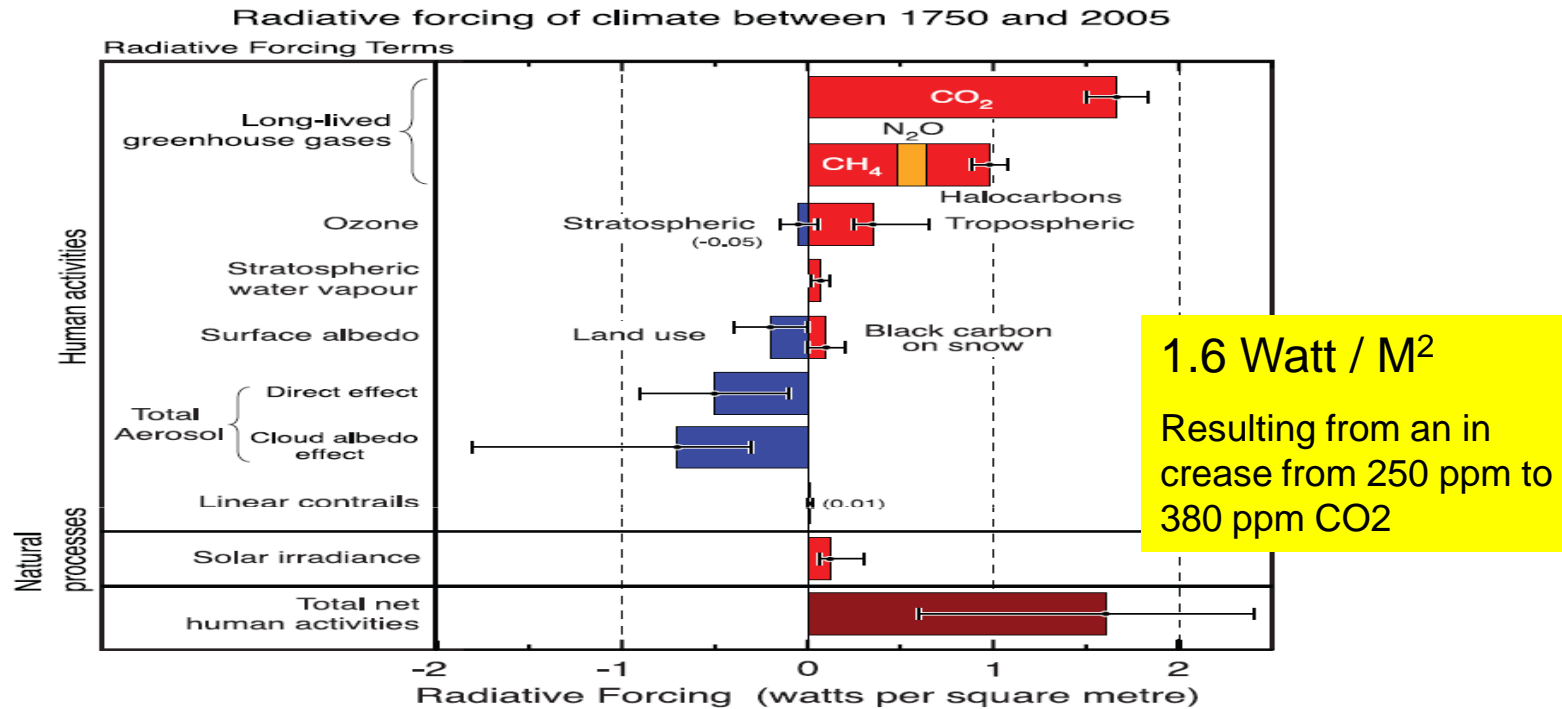


Global Heat Balance



FAQ 2.1, Figure 1. Atmospheric concentrations of important long-lived greenhouse gases over the last 2,000 years. Increases since about 1750 are attributed to human activities in the industrial era. Concentration units are parts per million (ppm) or parts per billion (ppb), indicating the number of molecules of the greenhouse gas per million or billion air molecules, respectively, in an atmospheric sample. (Data combined and simplified from Chapters 6 and 2 of this report.)

Global Heat Balance



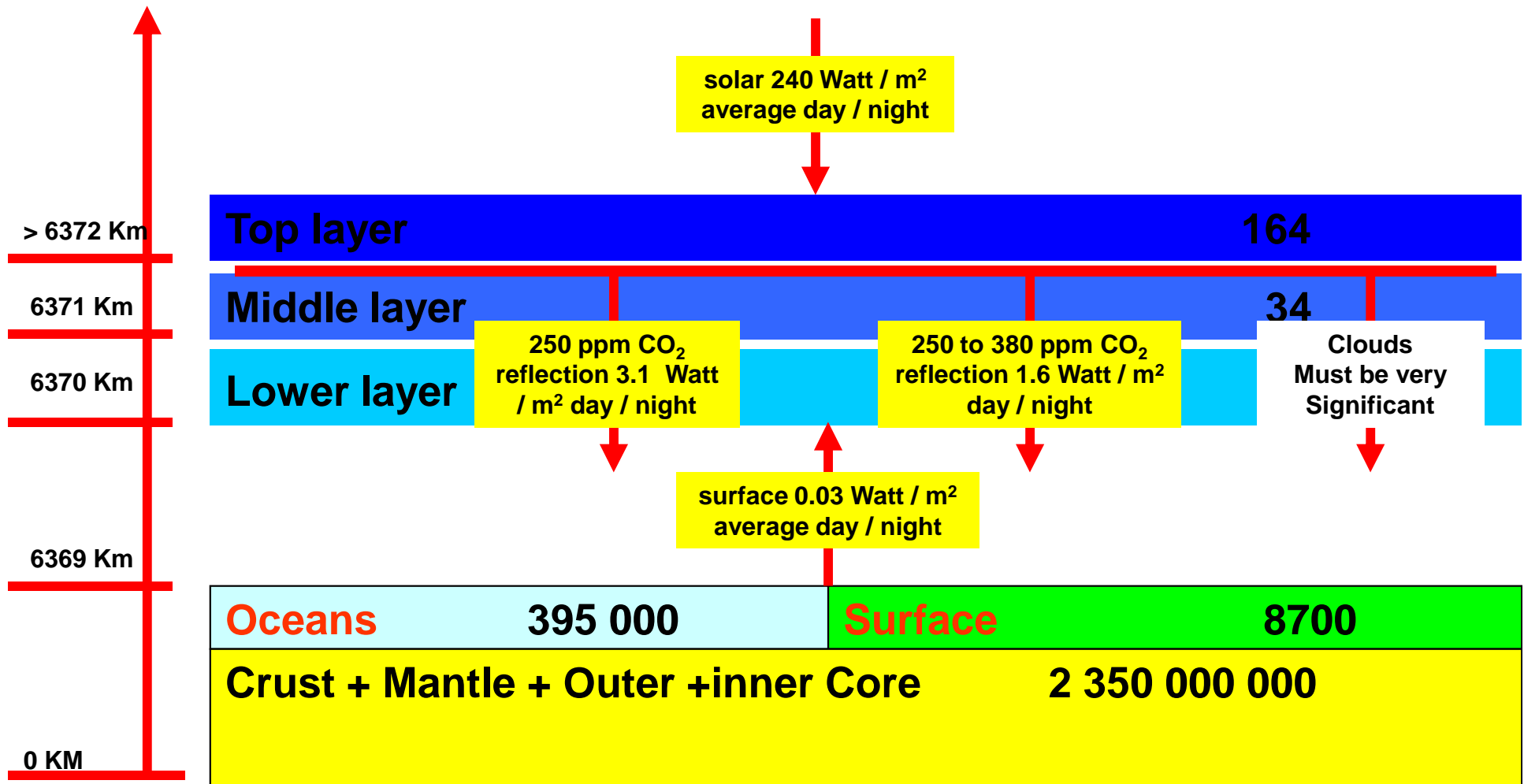
FAQ 2.1, Figure 2. Summary of the principal components of the radiative forcing of climate change. All these radiative forcings result from one or more factors that affect climate and are associated with human activities or natural processes as discussed in the text. The values represent the forcings in 2005 relative to the start of the industrial era (about 1750). Human activities cause significant changes in long-lived gases, ozone, water vapour, surface albedo, aerosols and contrails. The only increase in natural forcing of any significance between 1750 and 2005 occurred in solar irradiance. Positive forcings lead to warming of climate and negative forcings lead to a cooling. The thin black line attached to each coloured bar represents the range of uncertainty for the respective value. (Figure adapted from Figure 2.20 of this report.)

Radiative force of 250 PPM 3.1 Watt / M²

Global Heat Balance



Heat Content and Intensity of Flow



Global Heat Balance

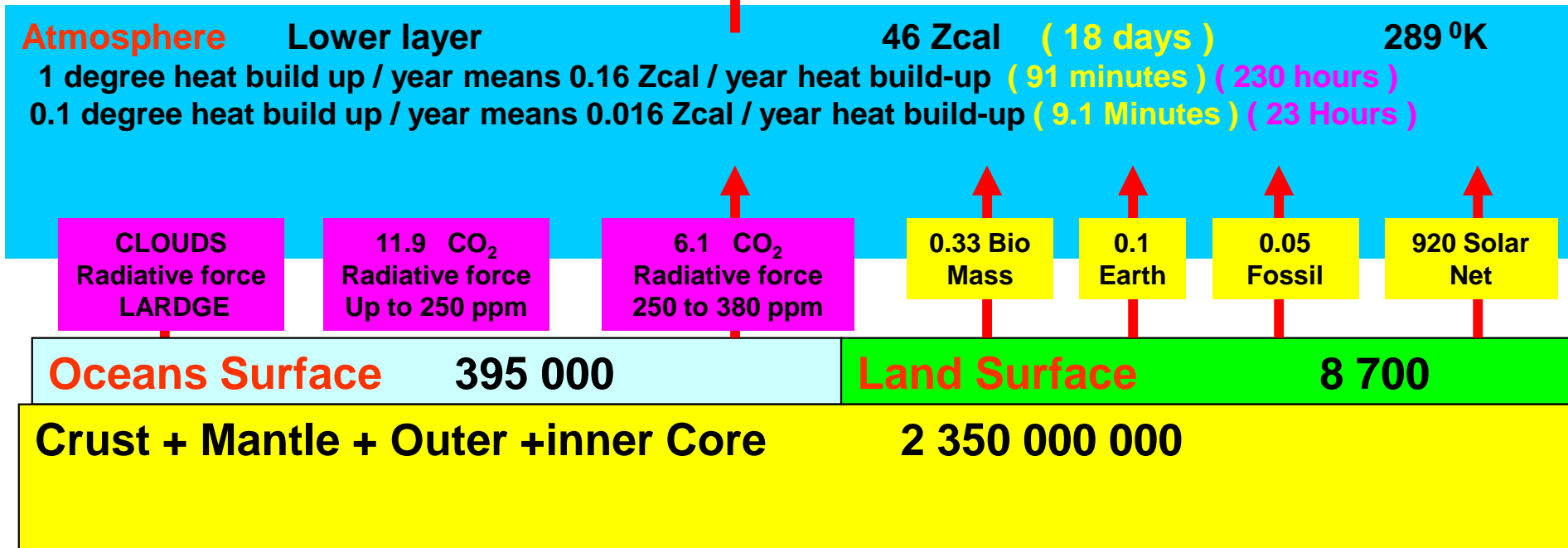


Heat Content and Flow / Year in Zcal

To have no global warming in the lower layer of Atmosphere , which is where the measurements take place, all heat needs to

- leave the atmosphere

$$\text{Total } 920 + 0.05 + 0.1 + 0.33 + 6.1 = 926.48$$



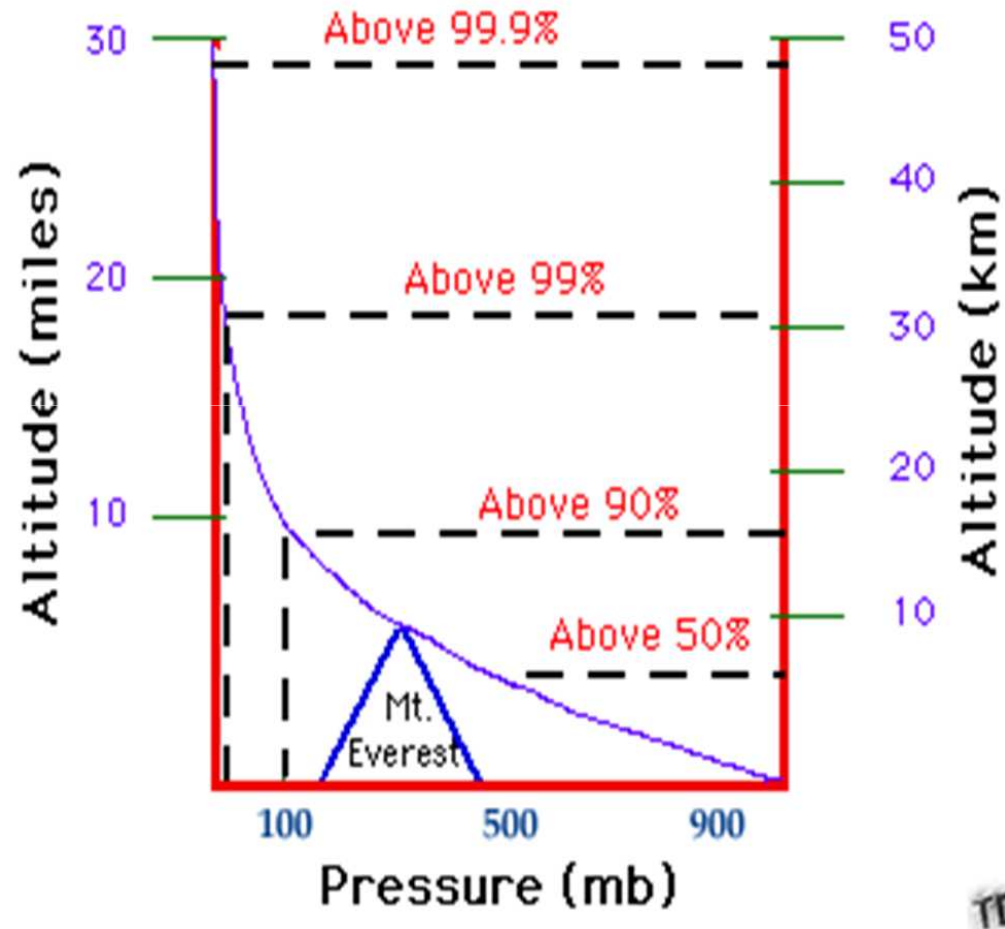
Global Heat Balance



If 0,5 degree C build up (from 1980 to 2000) was the result of 1,6 Watt/ M2 radiative force than only 0,066 % of the heat stayed actually behind in the lower layer (0,08 Zcal from 122 Zcal)

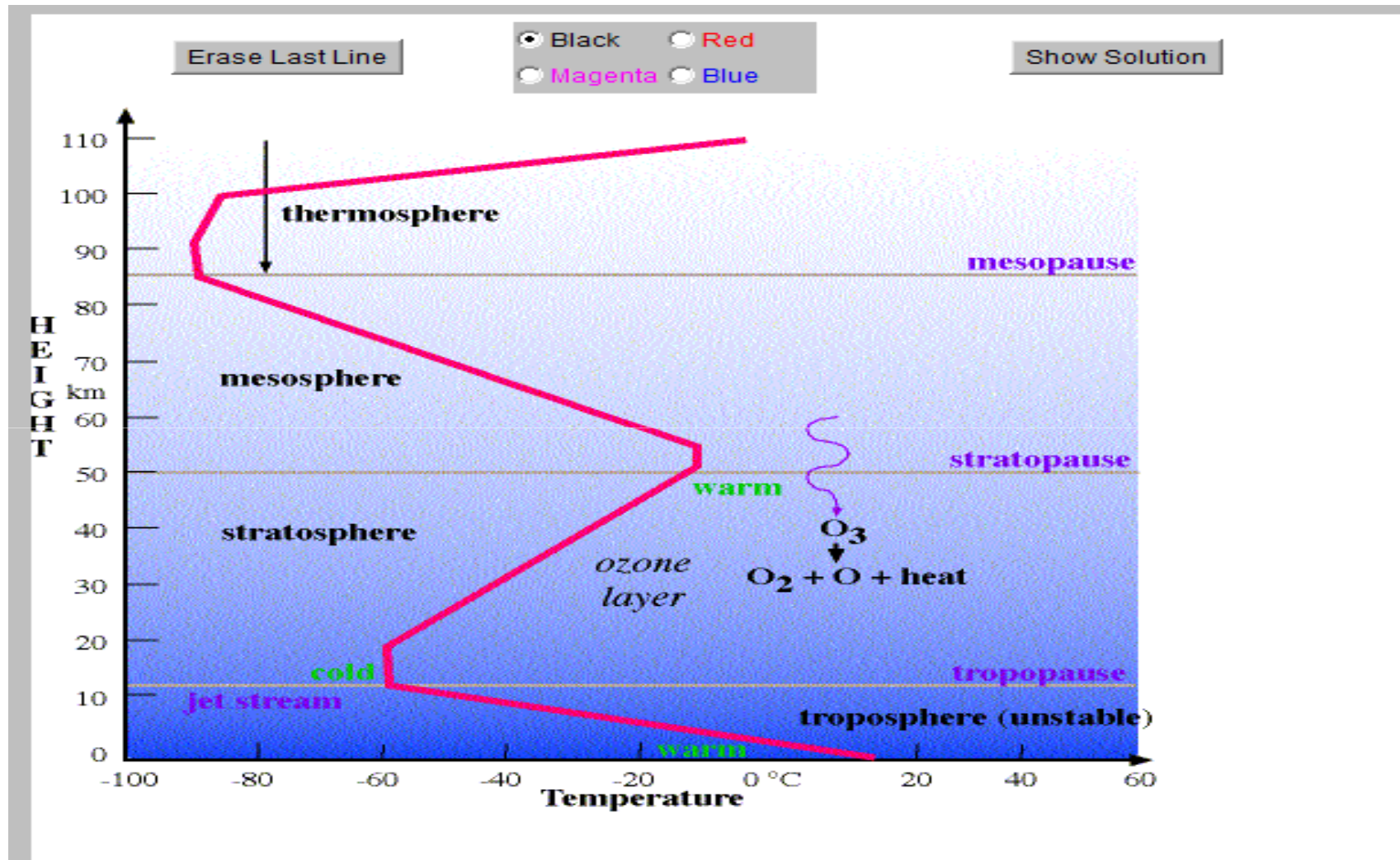
So why can't we cool the layer to achieve a **WARMING NEUTRAL** situation ?

Global Heat Balance



The PPM is the same but there are fewer molecules per m³ due to pressure

Global Heat Balance



In terms of the heat balance a reduction of greenhouse gases would reduce the barrier to radiate heat to the stratosphere.

Reducing the rate of growth fossil CO₂ in the CO₂ balance means in the heat balance that we continue to increase the barrier to radiate heat to the stratosphere

**The CO₂ actions are not moving any Heat to the stratosphere
..... They are only reducing the speed of barrier build-up**

**Like reducing the building speed with which we add
insulation material to a house ... we continue to build !!**

Global Heat Balance



With no program or project to move heat to the stratosphere

We rely on nature to control the temperature with the next volcanic eruption or any other accidental or coincidental development outside human control

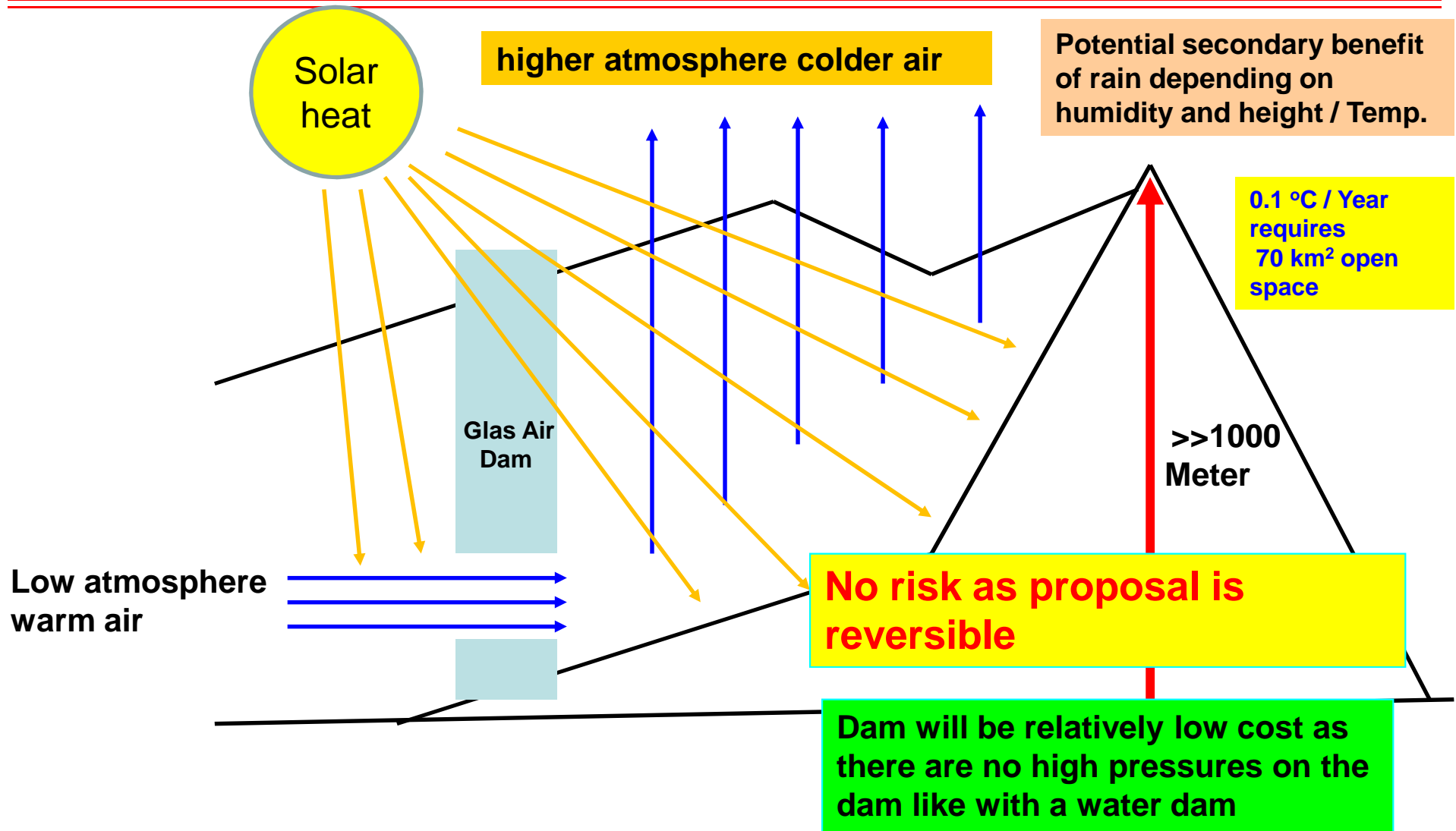
If we believe in global warming

We are really stuck ... waiting for the next good or bad natural event

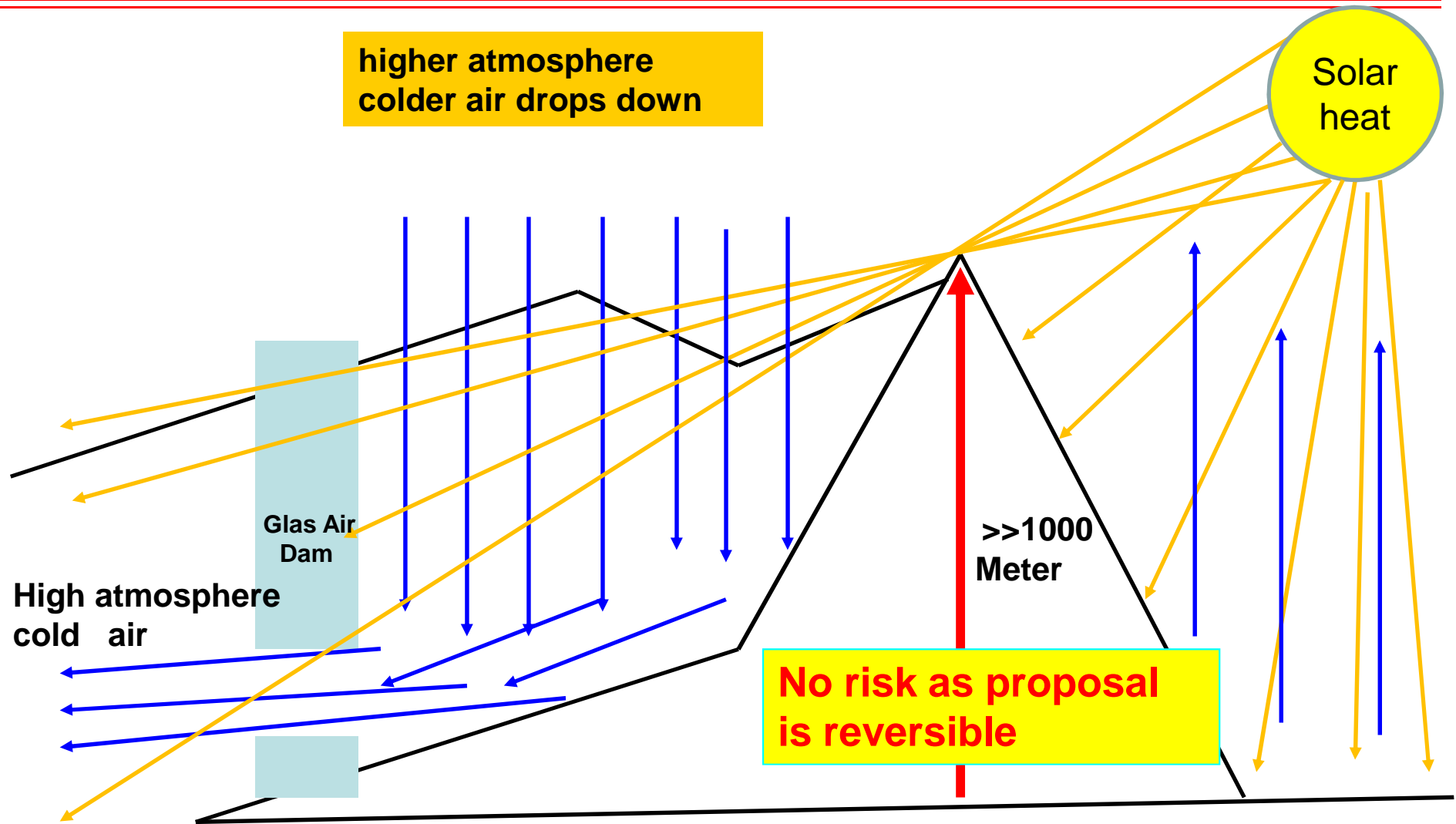
Unless we find a way to facilitate extra heat flows to the stratosphere , which is the only place where heat must go.

Create a Window to let warmer air move up

Global Heat Balance



Global Heat Balance



I have used many scientific studies , concepts and data to piece this together

That is what industrialists and executives do when they take actions in the businesses they manage they decide which way to go without 100 % accurate data but also taking into account the risk elements

In the business of global warming and CO₂ and greenhouse gases we need to do the same move in the right direction , with low risk and preferably in a reversible way

...

**True for working on the demand side of CO₂.
True for building air dams to let Heat out.**

If we believe in global warming

and want to take control over our destiny

Warming Neutral looks easier to achieve within a shorter period of time than **CO₂ Neutral** through disposing excess heat of the lower layers into higher layers of the atmosphere to radiate out to the stratosphere.

CO₂ Neutral can be achieved by working on the supply as well as the demand side over a longer period of time

Trying to achieve **Warming Neutral** through **CO₂ Control** looks a long term goal and may well take too much time.

Conclusion

We need not only attack and control CO₂ and greenhouse-gases the insulation layer of the earth

But

We also need to attack and control HEAT itself and face up to reality of the HEAT mechanisms

Global Heat Balance



Thank you for your attention