

# Green bonds – why all the excitement?: The climate change context

Notes for talk at the HSBC Credit Conference 13<sup>th</sup> June 2017

Good afternoon. I'm here to talk about three things:

1. Our 'Phoney War' on climate change.
2. 'Tipping Points' which will one day cause a 'hot war' on climate change. and,
3. How Green Bonds can be powerful weapons once the war on climate change heats up.

## What do I mean by a 'Phoney War'?

- In September 1939 Britain and France declared war when Hitler invaded Poland. They mobilised armies to the border with Germany but did not feel strong enough to attack. So for 8 months there was a 'Phoney War' with no major fighting. Life in London and Paris went on with little change. Then in May 1940 Germany invaded France and the war became very real.
- The Paris Agreement commits to carbon emissions neutrality in the 2<sup>nd</sup> half of this century. This requires urgent, major changes to our economies and way of life. But to date, investors such as yourselves have been little affected. We know there is a problem but are waiting for some signal before we take serious action. We have a Phoney War on climate change.

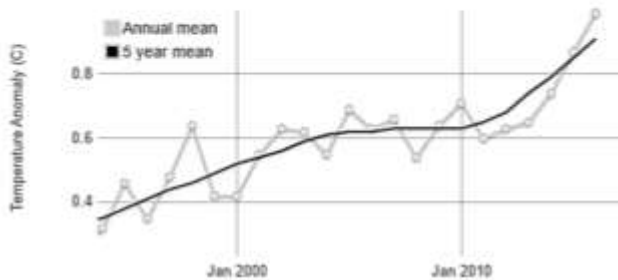
**One reason for this Phoney War is we look at the wrong numbers.**

- Our planet is gaining energy due to carbon dioxide blocking outgoing radiation much more than incoming radiation from the sun. We look at Earth’s surface temperatures to see the impact of this energy imbalance [Slide 2: 1.]. But year to year this gives confusing signal as **only 4%** of the energy imbalance is absorbed by land and atmosphere [2]. Further surface temperatures are jerked around by El Nino / La Nina cycles causing massive transfers of energy between the oceans and the atmosphere.
- We should look at the impact of the 96% of the energy which goes into the oceans and melts ice. When ice on land melts it flows into the sea increasing sea level. When seas warm they expand further raising sea level. So sea level [3.] rise shows the impact of the energy imbalance.

## The impact of Earth gaining energy

### 1. GLOBAL LAND-OCEAN TEMPERATURE INDEX 1993-PRESENT

Data source: NASA's Goddard Institute for Space Studies (GISS).  
Credit: NASA/GISS



### 2. WHERE THE ENERGY IMBALANCE GOES

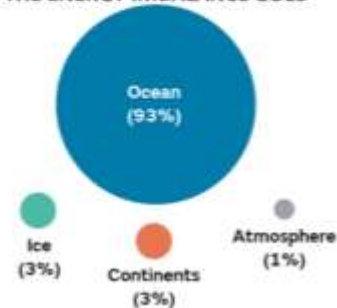
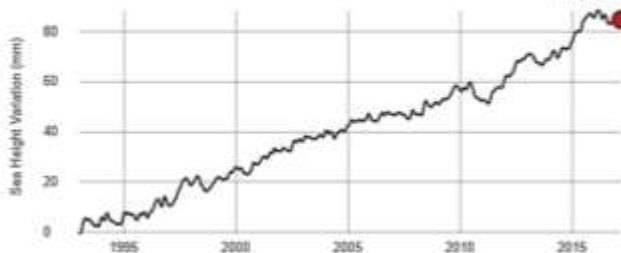


Figure 5. Excess energy absorbed by each component of the climate system since the 1970s.<sup>3</sup>

### 3. SATELLITE DATA: 1993-PRESENT

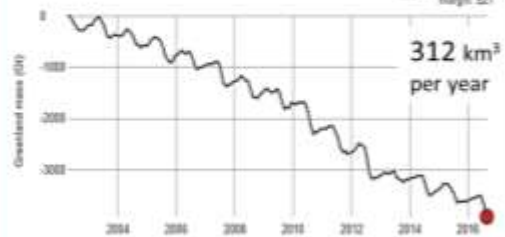
Data source: Satellite sea level observations.  
Credit: NASA Goddard Space Flight Center



RATE OF CHANGE  
↑ 3.4  
millimeters per year  
margin: ±0.4

### 4. GREENLAND MASS VARIATION SINCE 2002

Data source: Ice mass measurement by NASA's GRACE satellites.  
Credit: NASA

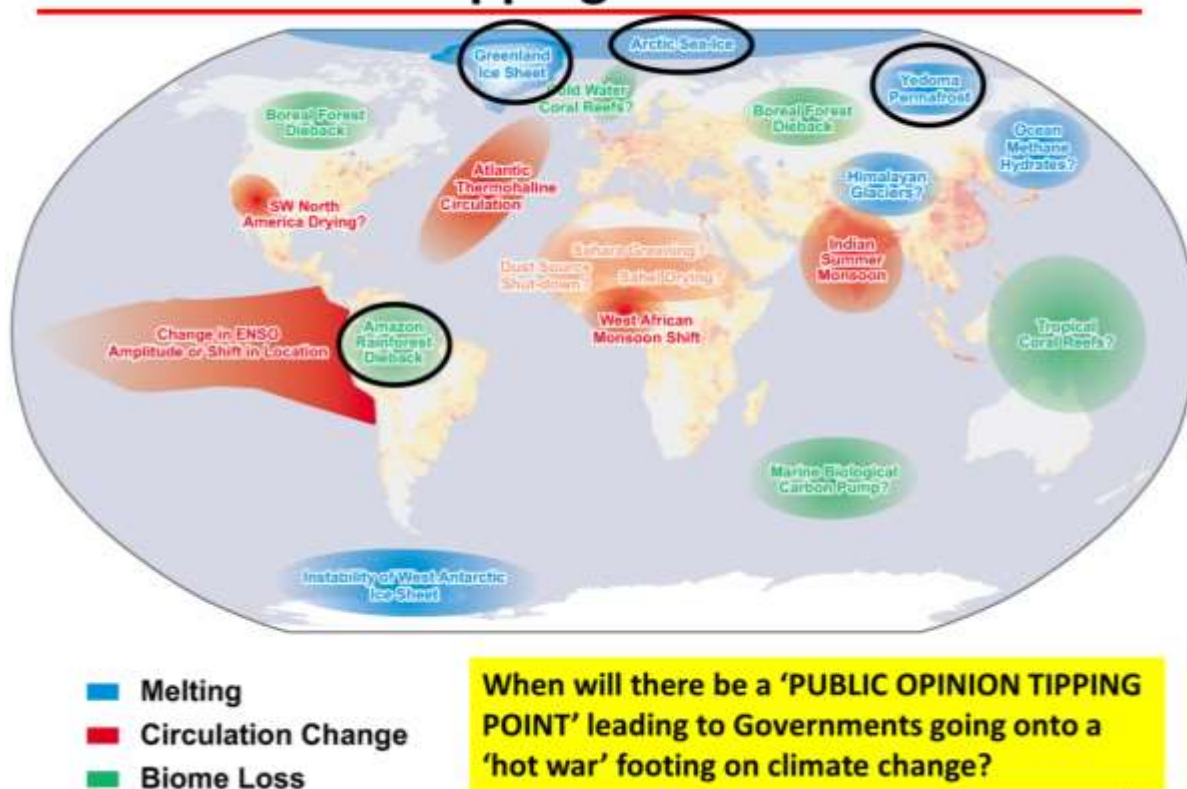


RATE OF CHANGE  
↓ 287.0  
Gt per year  
margin: ±21

Sources: 1: [www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/climate/cop22/theme\\_5-indicators-of-change.pdf](http://www.metoffice.gov.uk/binaries/content/assets/mohippo/pdf/climate/cop22/theme_5-indicators-of-change.pdf)  
2, 3 & 4: <https://climate.nasa.gov/vital-signs/>

## What will end our 'Phoney War' on climate change?

### Tipping Points



Source: [www.metlink.org/wp-content/uploads/2015/12/Tippingpoints\\_Lenton.jpg](http://www.metlink.org/wp-content/uploads/2015/12/Tippingpoints_Lenton.jpg)

- [Slide 3] The worrying part of global warming is Tipping Points which increase its impact and which are very difficult to reverse.
- We are already seeing the Arctic Sea Ice tipping point [1.] where greater melting in the summer creates more dark, sunlight absorbing water in place of white, sunlight reflecting ice. So the Arctic is warming more than twice as fast as the rest of the planet. Its warming will lead to two<sup>1</sup> other tipping points:
  1. First, the acceleration of the melting of the Greenland Ice Cap [2.]. This may soon reach a point of 'no return' leading to an eventual increase of 7 meters in sea level.
  2. Second, Siberia [3.] next to the Arctic Ocean has vast areas where tundra has built-up great deposits of permanently frozen dead plants over millions of years. If the permafrost melts this organic matter will decompose releasing methane, which is another greenhouse gas, boosting global warming.

As this picture shows, there are other tipping points in the climate system. To mention one more: the Amazon Forest [4.] drying-out and burning. The forest makes fantastic use of the

<sup>1</sup> There is a third possible impact of Arctic warming about which there is currently controversy: As the temperature difference between the Arctic and temperate latitudes reduces the Jet Stream around the Arctic becomes less stable. In recent years it has sometimes looped South causing severe cold snaps in the USA, Europe and Russia. It has sometimes looped North bringing heat waves.

relatively little moisture which winds blow into the Amazon Basin. Rain is caught in the tree canopy and evaporates to form a low altitude cloud layer. This reflects sunlight keeping the forest relatively cool and moist. Without the trees the rain would go straight into rivers, clouds greatly reduce and the basin become hot and arid. This will increase global warming as there will be fewer clouds reflecting radiation back into space.

**NOW MY QUESTION FOR YOU** is at what point will these threats lead to a **Public Opinion Tipping Point** [5] which causes substantial change in Public Policy? Markets react rapidly when there is a new 'reality'. How will the investments you manage be affected when that Tipping Point happens? To provide some insights:

1. First: beware of 'news' on climate change.
  - a. Key elements of climate science were discovered a long time ago. For example, John Tyndall proved carbon dioxide absorbs infrared in 1865. So that's not 'News'.
  - b. Often it is relatively inconsequential debates such as how quickly Himalayan glaciers will melt that makes 'News'.
2. Next: Some forthcoming IPCC reports may bring a Public Opinion Tipping Point closer. In particular:
  - a. Next year it will report on how to keep the average global temperature increase below 1.5C. The near impossibility of this task may raise awareness of how serious climate change is.
  - b. Then, in 2019, it will issue reports clarifying climate change impacts on oceans, the cryosphere and land use. Perhaps these will draw attention to the seriousness of the climatic tipping points.
3. Finally EVEN IF we limit the temperature increase to 2C we will eventually have over 25 meters of sea level rise. Many of our great cities will be destroyed. Much of our most productive agricultural areas will go. People argue such long-term losses are irrelevant to investors. BUT, a clearer understanding of these losses could cause Public Opinion Tipping Point and hence Government policy. And some impacts will be felt this century. For example half Vietnam's current agriculture output comes from the Mekong delta, which is only about 1 meter above sea level.

### **And how does all this relate to Green Bonds?**

- We only need modest changes in Government regulations for Green Bonds to incentivise some of the investment needed to meet the threat of climate change.
- The good work which my fellow panel members have done in issuing Hong Kong's first Green Bonds is key to local 'road testing' of the Green Bond Principals.
- Once there is confidence in these principals, Governments can adjust taxation, bank capital adequacy ratios and approval processes to make Green Bonds financially attractive to both issuers and investors thus directing resources to fight climate change.