



Sunshine and Sine Waves

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A new Research Paper from the IPA has found there is sufficient evidence to question the Intergovernmental Panel on Climate Change's (IPCC) view that global warming in the industrial era is dominated by anthropogenic factors, particularly greenhouse gas (GHG) emissions. The paper, *Sunshine and Sine Waves: Identifying Oscillatory Patterns in Temperature Records Highlights Solar Influences While Reducing Anthropogenic Contribution to Recent Warming*, by IPA Senior Fellow, Dr John Abbot, challenges the IPCC view which framed the discussions at COP26 in Glasgow. At the conference the United Nations Secretary-General, António Guterres, and the host Government (the UK), sought commitments to achieving net-zero emissions globally by 2050 in order to limit temperature increase to 1.5°C above pre-industrial levels. However, if the contribution of GHG to recent temperature increases is only 50% or less than the IPCC estimates, then the effectiveness of cutting emissions on temperatures will be correspondingly less. It is important to review the size of the claimed impact on temperature, because the amount of money contemplated at COP26 to achieve net zero runs into the hundreds of billions and even trillions of dollars.

It would have been more reasonable for the assembled nations to recognise that climate change is a continuing natural phenomenon with persistent cycles, and that humans have experienced and survived climate change in the past, for example during the Little Ice Age (LIA) and the Medieval Warm Period (MWP). One source of natural variability is the direct influence of the Sun, as measured by total solar irradiance (TSI). This paper also explores a further, indirect, influence of the Sun – that arising from its ability to temper the impact of cosmic rays – which in turn influences temperature via cloud formation.

[Download the Research Paper, *Sunshine and Sine Waves* [here](#).]

Analysis was undertaken to model oscillations in temperature series based on the temperature series in pre-industrial times (<1880 AD), with the projections produced by the model (after 1880 AD) closely tracking observed temperature changes. In the composite temperature series that is modelled, a long oscillatory cycle of approximately 1,000 years dominates the variation. Further analysis conducted by the author, and presented here, suggests that both direct and indirect influences of solar activity (TSI and cosmic rays, respectively) can explain this variation, and both, therefore, diminish the estimated amount of temperature variation attributable to anthropogenic causes.

Figure 4: Sine-wave components for proxy temperature record from Ljungqvist¹ showing dominant millennial sine wave (blue) with individual centennial and decadal sine waves.⁶

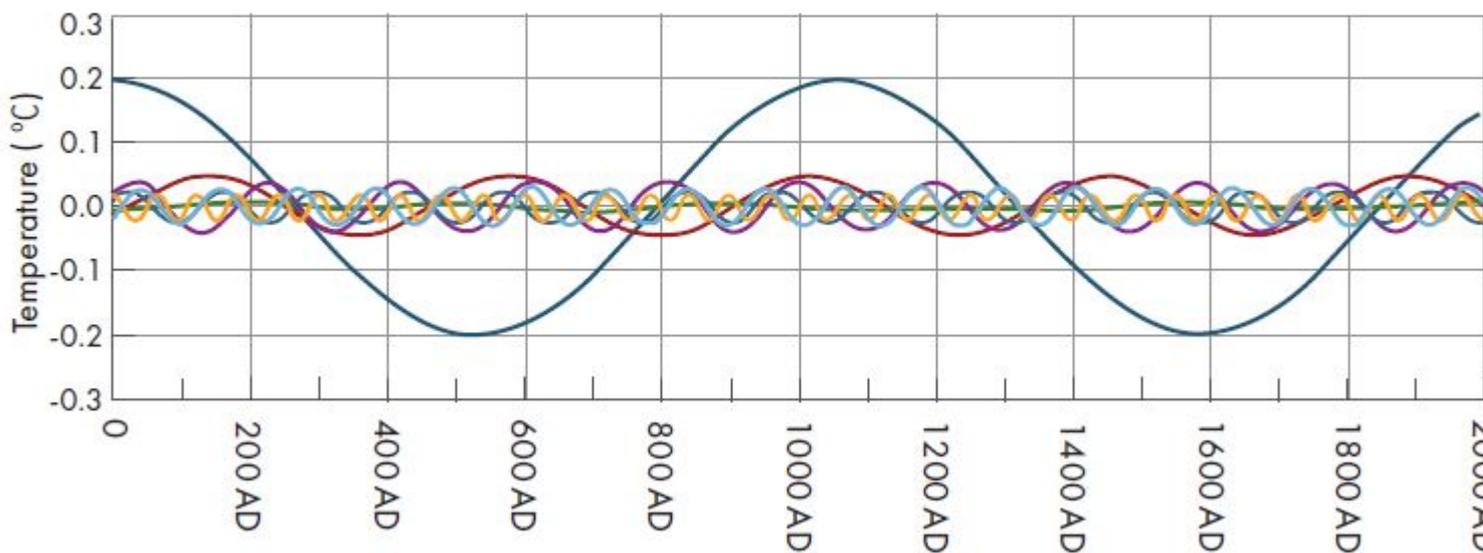


Figure 4, from *Sunshine and Sine Waves*

The conclusion of COP26 involved developing several versions of the final agreement in the last days of the conference in order to get the consensus of nearly 200 countries. The actual contribution of humans (rather than cyclic phenomena) bears directly on a key point of contention,



the issue of accountability for climate change and the need for greater amounts of “climate finance” from the developing world. The developing countries arguing that developed nations, whose historical emissions are largely assumed to be responsible for global warming, must pay more to help them adapt to its consequences, and possibly pay compensation for loss and damage sustained. Within this framework of consideration of liability, it is vital to quantify the relative contributions made from anthropogenic and natural causes.

Download the Research Paper [here](#).