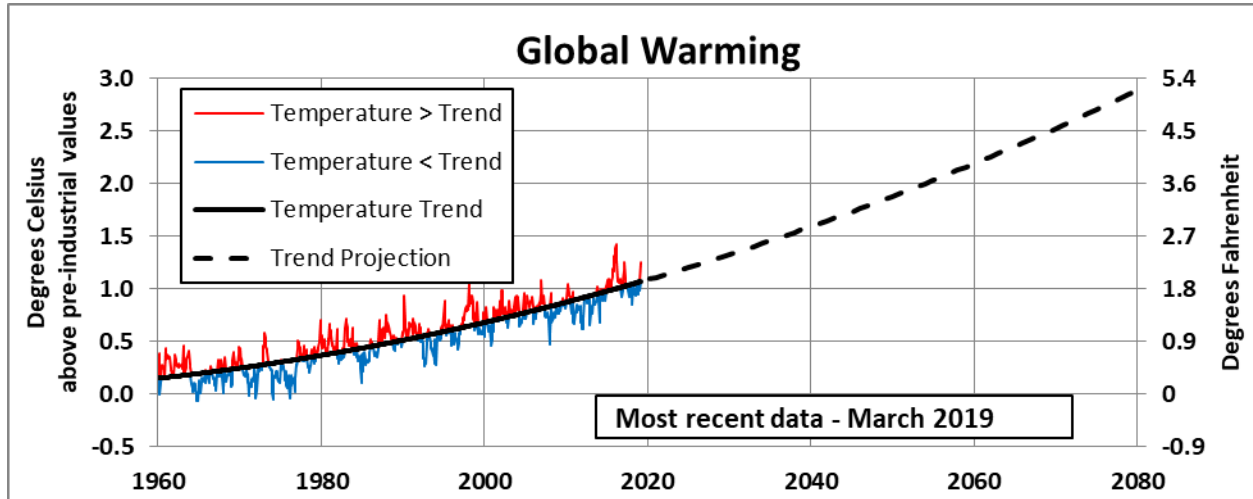


Global Warming Data, Trend and Projection
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Update Note –

Global surface temperatures for March 2019 were higher than the trend, making it the 2nd warmest March on record. Temperature was 1.26 °C above pre-industrial values for the first time since the super-El Niño in the winter of 2015-16. Note that the March temperature was only 0.24 °C below the optimistic international limit of 1.5 degrees above pre-industrial values. The chart illustrates that monthly temperatures will exceed 1.5 degrees well before the trend reaches that level. Mild El Niño conditions are present and expected to continue into the Northern Hemisphere summer of 2019. Solar irradiance is approaching the minimum of its ≈11 year cycle, a cooling effect compared to recent years.

Data – Monthly global surface temperature anomaly data (red and blue lines) are monthly differences from the average temperature *for that month* during the years 1901-2000 and are available from [NOAA](http://www.noaa.gov). The red (blue) lines represent monthly temperatures warmer (cooler) than the trend. Note that **0.2 °C** has been added to the NOAA values to account for the difference between the 20th century average and pre-industrial values.

Trend and Projection — The trend shown in the chart is a quadratic fit to the recorded monthly global temperatures since 1960 relative to pre-industrial values. The projection is the continuation of this curve into future times. Note that the projection will change as the historical trend changes in response to new

data. Recent temperatures are about half the 2.0 °C target limit established by the Paris agreement. Based on the current projection, global temperatures will be 1.5 °C above pre-industrial levels in 2036 and the Paris Agreement's +2.0 °C target limit would be surpassed around 2054 (see chart.)