IPCC – Chapter 12 – Extreme Weather

1. *High confidence* except over a few regions (CNA and NWS) where there is *low agreement* across observation datasets.
2. *High confidence* in tropical regions where observations allow trend estimation and in most regions in the mid-latitudes, *medium confidence* elsewhere.
3. *High confidence* in all land regions.
4. Emergence in Australia, Africa and most of Northern South America where observations allow trend estimation.
5. Emergence in other regions.
6. Increase in most northern mid-latitudes, Siberia, Arctic regions by mid-century, others later in the century.
7. Decrease in the Mediterranean area, Southern Africa, South-west Australia.
8. Northern Europe, Northern Asia and East Asia under RCP8.5 and not in low-end scenarios.
9. Europe, Eastern and Western North America (snow).
10. Arctic (snow).
11. Arctic sea ice only.
12. Everywhere except WAN under RCP8.5.
13. With varying area fraction depending on basin.
14. Pacific and Southern oceans then many other regions by 2050.

High confidence of decrease | Medium confidence of decrease | Low confidence in direction of change | Medium confidence of increase | High confidence of increase

1856

https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Chapter12.pdf

What happens when a hurricane develops, a forest fire starts, the temperatures get above 25 °C (i.e.: the new standard for a heat wave (?)), etc.? The "media" runs a story saying that this or that particular extreme weather event is due to "climate change" and/or is 15%, 25%, etc. more likely to have happened because of "climate change" (i.e.: rising CO_2 levels). All based on attribution studies using computer models that have been self-acknowledged to "run way too hot" and are using unrealistically high emission scenarios. What does the IPCC have to say about the historical trends in extreme weather? Not much! The IPCC's Table 12.12 shows no discernible trends in 24 of the 33 historical "Climate Impact-driver" categories. Of the remaining 9 categories, three of them are mean air and ocean temperature, and atmospheric CO_2 at surface. None of these categories are in general dispute. The planet has warmed out of the Little Ice Age (LIA) and CO_2 has been rising since the pre-industrial era. Two of the categories (ocean salinity and dissolved oxygen) have little to nothing to do with extreme weather. The remaining 4 categories have only a medium trend confidence and/or are localized, rather than global trends. So, there is (according to the IPCC) "low confidence in direction of change" for virtually every extreme weather event category. No discernible trends for hurricanes, floods, drought, forest fires, etc. The IPCC forecasts do not add much to the trend data. Four categories show up prior to 2050 and one more by 2100 (using RCP8.5 (?)).

IPCC Extreme Trends Table 12.12

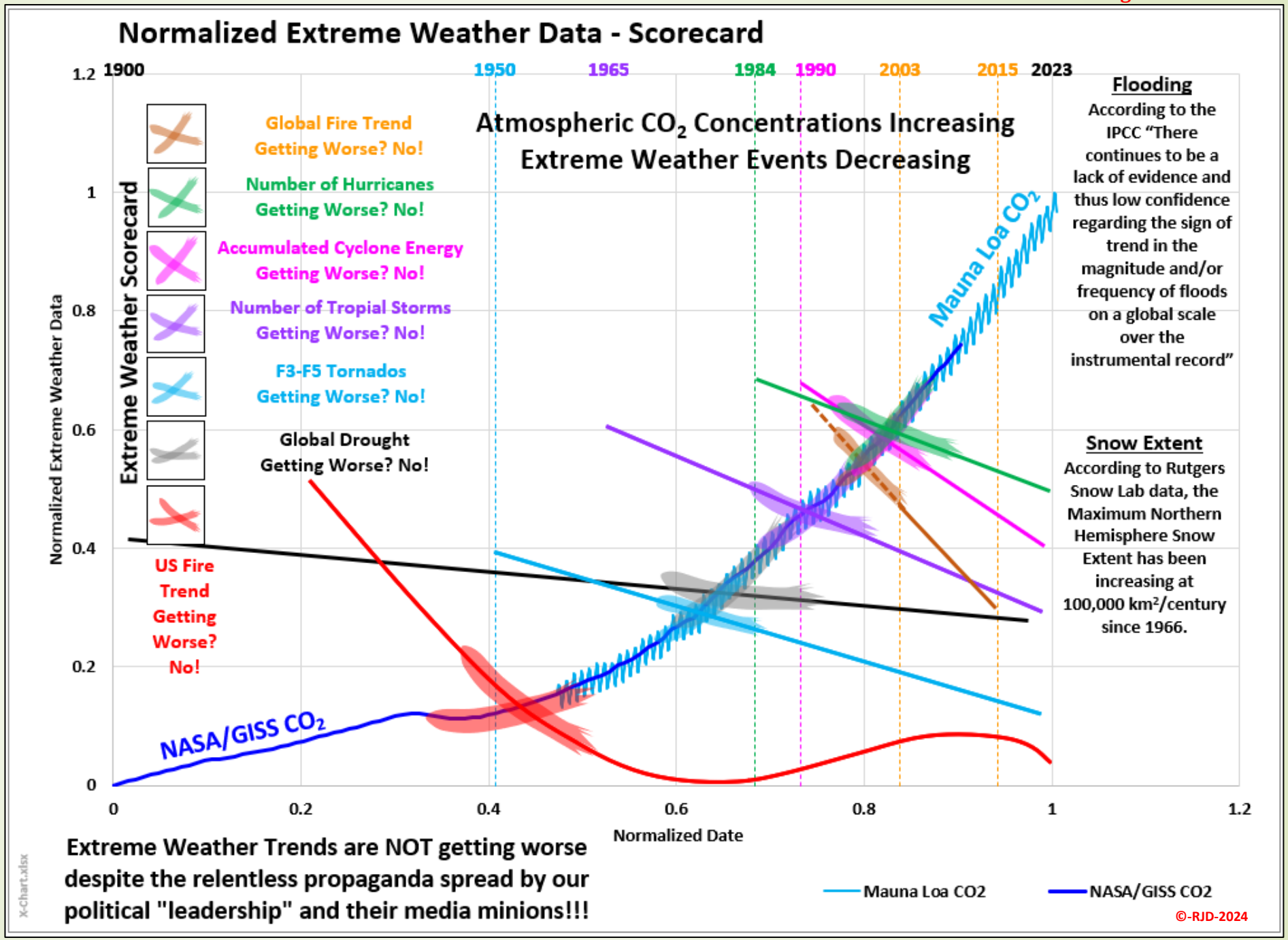
Table 12.12 | Emergence of CIDs in different time periods, as assessed in this section. The colour corresponds to the confidence of the region with the highest confidence: white cells indicate where evidence is lacking or the signal is not present, leading to overall *low confidence* of an emerging signal.

Climatic Impact-driver Type	Climatic Impact-driver Category	Already Emerged in Historical Period	Emerging by 2050 at Least for RCP8.5/SSP5-8.5	Emerging Between 2050 and 2100 for at Least RC8.5/SSP5-8.5
Heat and Cold	Mean air temperature	1		
	Extreme heat	2	3	
	Cold spell	4	5	
	Frost			
Wet and Dry	Mean precipitation		6 / 7	
	River flood			
	Heavy precipitation and pluvial flood			8
	Landslide			
	Aridity			
	Hydrological drought			
	Agricultural and ecological drought			
	Fire weather			
Wind	Mean wind speed			
	Severe wind storm			
	Tropical cyclone			
	Sand and dust storm			
Snow and Ice	Snow, glacier and ice sheet		9	10
	Permafrost			
	Lake, river and sea ice	11		
	Heavy snowfall and ice storm			
	Hail			
	Snow avalanche			
Coastal	Relative sea level		12	
	Coastal flood			
	Coastal erosion			
Open Ocean	Mean ocean temperature			
	Marine heatwave			
	Ocean acidity			
	Ocean salinity	13		
	Dissolved oxygen	14		
Other	Air pollution weather			
	Atmospheric CO_2 at surface			
	Radiation at surface			

IPCC – Extreme Weather Historical Trends

Extreme Weather Trends

The IPCC's Table 12.12 uneventful extreme weather revelations should not be surprising given the historical empirical data. In fact, the empirical data is generally showing the opposite position to the All CO_2, All the Time alarmist narrative. As atmospheric CO_2 concentrations are rising, most extreme weather trends are moving lower. Hurricanes/tropical storms, tornados, drought, fire are not occurring more often nor getting more extreme. Flooding (according to the IPCC) is statistically flat (no +/- trend) and maximum snow extent in the Northern Hemisphere (according to the Rutgers Snow Lab) has been increasing for decades. This chart shows trends in extreme weather on the same chart by normalizing the empirical data. For example, the record number of global hurricanes in 1992 (56) equates to 1 and the record 2009 low (14) equates to 0. The same applies to each extreme weather parameter, CO_2 and time. Only the regression lines are shown here. The detailed empirical data sets, additional discussion, and the relevant links can be found in my CSS-52 – Extreme Weather Events post. A parameter by parameter construction is included in this post. CO_2 is increasing, extreme weather events are declining. Is the media lying?



IPCC – Chapter 12 – Extreme Weather Trends

GSM – Grand Solar Minimum. You really should do the Research!

Historical Weather Trends

As mentioned on slide CSS-64a, only 4 categories show some historical trend in extreme weather (according to the IPCC). This slide discusses those 4 categories.

2. Heat and Cold – Extreme heat

High confidence of increase but with this qualifier, "High confidence in tropical regions where observations allow trend estimation and in most regions in the mid-latitudes, medium confidence elsewhere." The extreme heat is not global and there is still no proper recognition of the Dirty 30s which have been homogenized out of existence (a period where many high temperature and heat spell records were set).

4. Heat and Cold – Cold spell

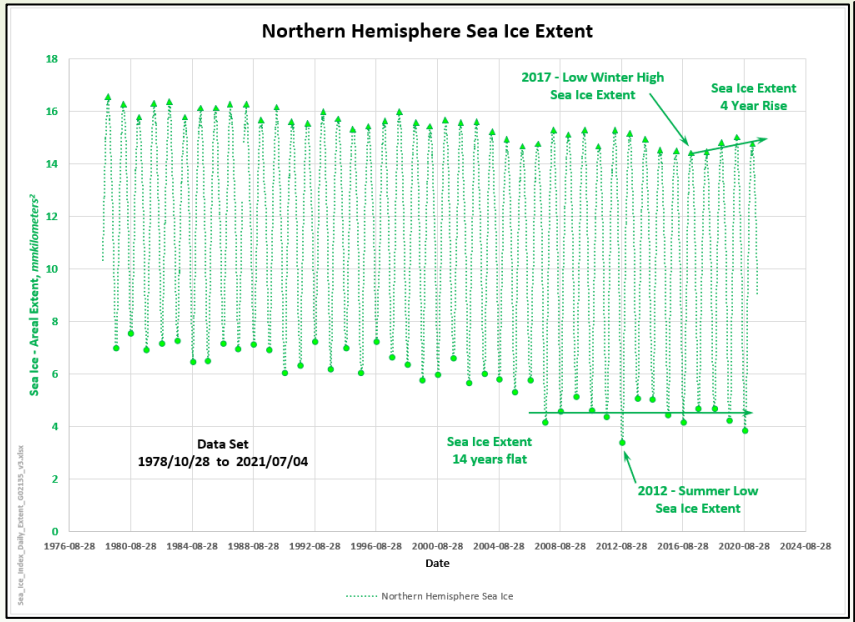
Medium confidence of decrease but with this qualifier, "Emergence in Australia, Africa and most of Northern South America where observations allow trend estimation." Cold spells are not decreasing globally. Given the Northern Hemisphere has significantly more land mass, the Southern Hemisphere cold spell significance is not that important.

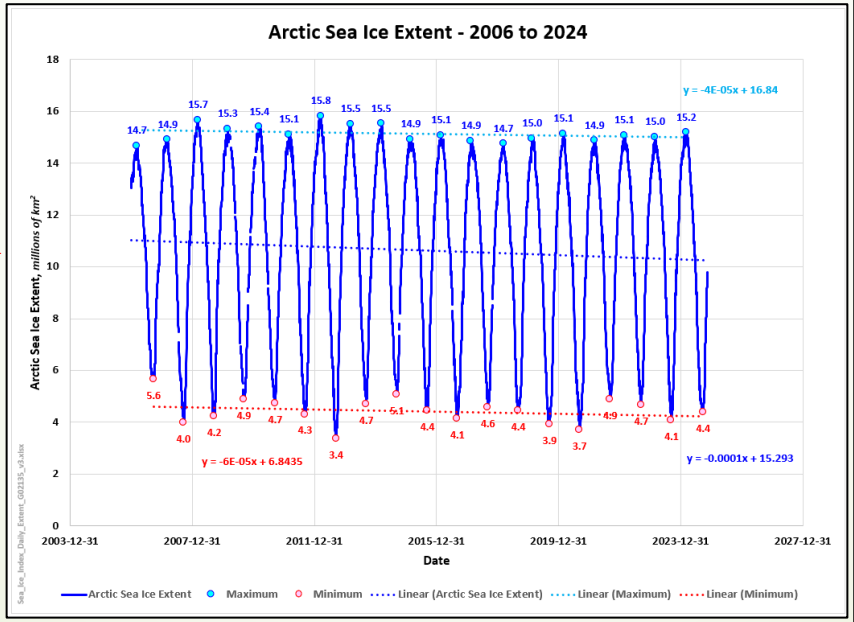
Snow and Ice - Permafrost

Medium confidence of decrease. Not a strong endorsement.

11. Snow and Ice – Lake, river and sea

High confidence of decrease but with this qualifier "Arctic sea ice only." Again, not happening globally. And not an overly strong trend. Even in the relatively short satellite period, 1978 to the present, the decline starting in 1978, has not been very dramatic and has effectively disappeared since 2007. This year's Arctic sea ice low (4.4 million km^2) is 29.4% above the record low (since 1978) set in 2012 (3.4 million km^2). Arctic sea ice has not disappeared as many have predicted it would. The same people that do want to acknowledge that Arctic sea ice has been missing in action many times in the recent past during the many warm periods of the Holocene interglacial (all at much lower CO_2 levels). Why are the media and politicians pumping declining extreme weather events as climate change when "the IPCC science" says otherwise?





Climatic Impact-driver Type	Climatic Impact-driver Category	Already Emerged in Historical Period
Heat and Cold	Mean air temperature	1
	Extreme heat	2
	Cold spell	4
	Frost	
Wet and Dry	Mean precipitation	72.7%
	River flood	
	Heavy precipitation and pluvial flood	
	Landslide	
	Aridity	
	Hydrological drought	
	Agricultural and ecological drought	
	Fire weather	
Wind	Mean wind speed	
	Severe wind storm	
	Tropical cyclone	
	Sand and dust storm	
Snow and Ice	Snow, glacier and ice sheet	
	Permafrost	
	Lake, river and sea ice	11
	Heavy snowfall and ice storm	
	Hail	
	Snow avalanche	
Coastal	Relative sea level	
	Coastal flood	
	Coastal erosion	
Open Ocean	Mean ocean temperature	
	Marine heatwave	
	Ocean acidity	
	Ocean salinity	13
	Dissolved oxygen	14
Other	Air pollution weather	
	Atmospheric CO_2 at surface	
	Radiation at surface	

No Trend

No Trend

No Trend

No Trend

IPCC – Chapter 12 – Extreme Weather Forecasts

The historical data has little to no evidence of accelerated extreme weather event activity. So, what should we expect going forward? The answer is more of the same and it would appear that the IPCC agrees. They do see 4 category trends emerging by 2050 and one more between 2050 and 2100, but with the following qualifier, "at Least for RCP8.5/SSP5-8.5". The RCP8.5/SSP5-8.5 emission scenarios, according to the IPCC, have a low likelihood of happening. Most climate researchers would put the chances of happening somewhere between implausible to impossible. More discussion on the next slide. Do these five forecasted trends even show up in a reasonable emission scenario like RCP4.5/SSP2-4.5? 3. Heat and Cold – Extreme heat - High confidence of increase but with this qualifier, "High confidence in all land regions." Does that mean low or medium confidence for the ocean regions (70.8% of the earth's surface)? 5. Heat and Cold – Cold spell - Medium confidence of decrease but with this qualifier, "Emergence in other regions." Rather vague. 6. and 7. Wet and Dry – Mean precipitation - High confidence of increase but with this qualifier, "Increase in most northern mid-latitudes, Siberia, Arctic regions by mid-century, others later in the century." Medium confidence of decrease but with this qualifier, "Decrease in the Mediterranean area, Southern Africa, South-west Australia." Mean precipitation is a mixed package, some increases, some decreases. What is the net global trend? Increasing or decreasing? 8. Wet and Dry – Heavy precipitation and pluvial flood - Medium confidence of increase (between 2050 and 2100) but with this qualifier, "Northern Europe, Northern Asia and East Asia under RCP8.5 and not in low-end scenarios." This is not a valid add if the trends only appear under an RCP8.5 emission scenario. 9. and 10. Snow and Ice – Snow, glacier and ice sheet - Medium confidence of decrease but with these qualifiers, "Europe, Eastern and Western North America (snow)" and "Arctic (snow)". Not a lot of confidence and a prediction that is in opposition to the historical trends. Northern Hemisphere fall and winter snow coverage has been increasing for decades. 12. Coastal – Relative Sea Level - Medium confidence of increase but with this qualifier, "Everywhere except WAN under RCP8.5". Sea Level Rise is a bit of a red herring as shown in my CSS-47 – CO_2 and Sea Level DO NOT Correlate post. The long-term SLR trend is linear (i.e.: NO acceleration). SLR decelerates and accelerates on a roughly 60-year cycle that parallels the Atlantic Multi-decadal Oscillation (AMO) cooling and warming. Open Ocean – Ocean acidity - High confidence of increase. The oceans were not acidic when CO_2 levels were in the ±4,000 ppm range why would they be acidic in the 600 to 900 ppm range? Ocean "acidity" has little to do with extreme weather. So, even in the All CO_2, All the Time alarmist's forecasted cases, there is little indication that "climate change" is leading to more or more intense extreme weather events. The opposite is true, and our media and politicians need to be called out as liars when they link "climate change" to weather.

PBO
GDP & Climate

Climatic Impact-driver Type	Climatic Impact-driver Category	Emerging by 2050 at Least for RCP8.5/SSP5-8.5	Emerging Between 2050 and 2100 for at Least RC8.5/SSP5-8.5
Heat and Cold	Mean air temperature		
	Extreme heat	3	
	Cold spell	5	
	Frost	No Trend	
Wet and Dry	Mean precipitation	6 / 7	
	River flood	No Trend	No Trend
	Heavy precipitation and pluvial flood		8
	Landslide		
	Aridity	60.6%	
	Hydrological drought	No Trend	
	Agricultural and ecological drought		
	Fire weather		
Wind	Mean wind speed		
	Severe wind storm		57.6%
	Tropical cyclone		
	Sand and dust storm		
Snow and Ice	Snow, glacier and ice sheet	9	10
	Permafrost		
	Lake, river and sea ice		
	Heavy snowfall and ice storm	No Trend	
	Hail		
	Snow avalanche		
Coastal	Relative sea level	12	
	Coastal flood	No Trend	
	Coastal erosion		
Open Ocean	Mean ocean temperature		
	Marine heatwave	No Trend	
	Ocean acidity		
	Ocean salinity		
	Dissolved oxygen		
Other	Air pollution weather	No Trend	
	Atmospheric CO_2 at surface		
	Radiation at surface	No Trend	

IPCC – RCP8.5 Implausible to Impossible

IPCC RCP8.5 Implausible

Here are some of the unlikely assumptions used to produce the RCP8.5 emission scenario.

- "annual carbon dioxide emissions more than tripling by century's end, the concentration of carbon dioxide in the atmosphere soaring to more than 900 parts per million, and the radiative forcing (i.e. a scientific concept used to quantify and compare the external drivers of change to Earth's energy balance) more than triple what it is today.";
- "assumed that global coal use would increase to over 800 exajoules" (from 200 exajoules in 2020);
- "world crude oil production in 2100 would have to be about four times that of 2015 to meet the assumed demand";
- "oil companies would have to find and produce roughly four trillion barrels of crude oil between now and 2100. That is about twice the level of proven crude oil reserves now plus the current estimate of technically recoverable resource potential";
- "countries of the world take no measures to reduce GHG emissions beyond those in place in 2014";
- The population projections of the other RCPs are within the 90th percentile of the UN projections (9 billion), while RCP8.5 is well outside it at (12 to 15 billion);
- The RCP8.5's projected 2100 energy use is 1,700 exajoules (twice the 750 to 900 exajoule range for the other emission scenarios which are twice the current energy use levels).