

## Climate Change Overview – 2016

**Climate Change is real. It is worse than we think. It is caused by the activities of man. There are political hurdles. There is hope and there are solutions.**

**1). Climate Change is real:** 97% of climate scientists are in agreement that climate change is real and it is caused by the activities of man.

**2). It is worse than you think:**

- 2015 was the hottest year on record and 2014 was the second hottest, going back to record keeping started in 1880.
- 16 of last 19 years are the hottest in recorded history.
- 2015 was the 39<sup>th</sup> consecutive year with a global temperature above the 20<sup>th</sup> century average global temperature.
- This global warming is due to the excessive buildup of CO<sub>2</sub> and other greenhouse gases in our atmosphere, and this warming is causing climate change.
- Hurricanes, typhoons and downpours are more powerful and more frequent, as well as floods associated with this extreme weather. Droughts are longer and more intense. Fires are more intense, and the fire season has become longer.
- Also as a consequence of this warming our ice caps and glaciers are melting increasing ocean levels. These ocean levels are also increasing due to the expansion of the warming oceans.
- Though not scientifically proven at this time due to a shorter period of records, it is theorized that climate change is causing more tornadoes, and these are occurring at atypical times.

**So what does climate change mean for the Midwest?**

**Heat:**

- In the Midwest warming is accelerating. If carbon emissions continue to increase average regional temperatures could rise by as much as 8.5 degrees F by the 2080s.
- More than 20 million Midwesterners live in an area where air quality fails to meet national standards due to pollution and a longer pollen season caused by warmer temperatures. Allergies and asthma are affecting more people. Under high temperature increase scenarios summer ozone levels could rise up to 50% by the end of the century in Chicago.

**Storms and Floods:**

- Midwest rainstorms and floods are growing more intense. Since 1958 the amount of very heavy rain and snow the region receives has increased about 45%.
- In the past 20 years there have been two floods previously considered one-in-300 year events.

**Droughts:**

- The combination of heat and more rain-free days will increase the risk of drought in the region. At its peak the 2012 drought covered 75% of the Midwest.

## **Great Lakes:**

- The Great Lakes are getting warmer, increasing the risk of toxic algae blooms that pose a health hazard to humans and fish. Lake Superior's summer surface temperature has increased by 4.5 degrees F. Temperatures are expected to rise another 7 degrees by 2050.

## **Extreme cold:**

- Even the extreme cold we are experiencing in the Midwest is due to global warming. Because the arctic region is warming up at a faster rate than the rest of the planet it disrupts the Polar Vortex current patterns, allowing colder arctic air to push further south.

## **So what does climate change mean for the Planet?**

- In a 2013 report commissioned by 20 governments, it was reported that more than 100 million people will die and the global economy will miss out on as much as 3.2 percent, or about \$2.4 trillion, of its potential output annually by 2030, if the world fails to tackle climate change.
- It calculated that 5 million deaths occur each year from air pollution, hunger and disease as a result of climate change and carbon-intensive economies, and the toll will likely rise to six million by the year 2030, if current patterns of fossil fuel use continue. More than 90% of those deaths will occur in developing countries, which are least responsible for climate change.
- It was reported that currently climate change was already costing the global economy a potential 1.6 percent of annual output or about \$1.2 trillion a year
- Also due to global water supply, food supply and health being negatively impacted there will be a huge strain on international security.

## **3). Climate Change is caused by man-made activities**

Based on the Milankovitch cycles described below for the last 650,000 years CO<sub>2</sub> ppm fluctuated between 180 (cooler climate) and 300 (warmer climate). Ice ages occur naturally every 100,000 years.

- The orbit or Eccentricity of earth has a cycle of 100,000 years. The orbit is not a circular. A circular orbit eccentricity is 0.00. The range for the earth is 0.005 to 0.058. It currently is 0.017. Accordingly, the earth's distance from the sun is depends on where the earth is on this cycle.
- The axial tilt or Obliquity cycle of earth is 41,000 years. The tilt ranges from 22.1 to 24.5 degrees and currently is 23.4. The axis currently points to the North Star. In 19,000 years it will point to Polaris. In 30,000 years it will point to Vega. This cycle is caused by the impact of other planets, though the moon stabilizes the impact. This axial tilt is to not be confused with the 365 seasonal tilt of the earth.
- The wobbling or Precession of the earth has a cycle of 26,000 years. This wobbling is similar to that of a top. The pull of the sun and moon causes this cycle.

Beginning with the industrial revolution in the 1860s and the increased consumption of fossil fuels, our atmosphere and oceans became the dumping grounds for the excess CO<sub>2</sub> being created.

Fast forward to after WWII when man began making a lot of stuff, and when annual carbon emissions began to progressively increase at an alarming rate.

Per the Carbon Dioxide Information Analysis Center (CDIAC) and National Oceanic and Atmospheric Administration (NOAA):

- 1850 annual carbon emissions were 54 million metric tons and CO<sub>2</sub> ppm was 285.
- 1950 annual carbon emissions were 1,630 million metric tons and CO<sub>2</sub> ppm was 311.
- 1970 annual carbon emissions were 4,053 million metric tons and CO<sub>2</sub> ppm was 325.
- 1988 annual carbon emissions were 5,965 million metric tons and CO<sub>2</sub> ppm was 351.
- 2013 annual carbon emissions were 9,000+ million metric tons and CO<sub>2</sub> ppm was 400.

By 2050 at the current trend CO<sub>2</sub> ppm will be approximately 600.

Our planet's CO<sub>2</sub> blanket has become too heavy and we are becoming too warm. The global average surface temperatures and ocean temperatures have increased, especially since about 1950. The earth has a fever and it is getting worse.

#### **4). There are political hurdles:**

- The Koch Brothers and their fossil fuel buddies want to dismantle the EPA and do away with air, water and land quality regulations. They want to pollute for free, and with no respect to the sustainability of our planet. Their Market Based Business model uses financial incentives which incentivizes risk taking, which sometimes means total disregard of current safety and environmental laws and regulations. Under this practice Koch Industries book opportunity costs, which are profits forgone from missed opportunities. In other words employees who play it safe can't strike it rich. Applying this practice to pipeline maintenance Koch employees calculated the opportunity costs of shutting down equipment to ensure its safety to be greater than the potential of pushing aging pipe to its limits. The fact that preventive maintenance is required by law doesn't always seem to register. Long story short was from 1988 to 1996, 11.6 million gallons of crude and petroleum products spilled from poorly maintained pipelines.
- With their money the Koch brothers are influencing national, state, and local elections by supporting candidates who deny climate change. They formed the Tea-Party which is based on their Libertarian positions, which includes no government control over environmental laws and regulations, took over the Republican Party, and currently over 25% of our US Congress is made up of climate change deniers.
- Another political hurdle is trying to counter-act the fake science that climate change is not real. The fossil fuel industry works with the denier industry to create the appearance of a debate when there is none. The intention is to influence our politicians and media with this fake science. They know if they can make it look like there is a debate the public will stay confused and not want to act on climate change. This is the same approach the denier industry took when trying to impede smoking, acid rain, and DDT regulations. In 1964 the surgeon general published a comprehensive report linking cigarette smoking with cancer and other diseases. It took decades to educate the public and finally pass regulations. A favorite tactic of the climate change denier industry is to cherry pick short term data to falsely imply a long-term scientific trend.

#### **5). There is hope. There are solutions:**

- The Climate Change conversation will continue to grow as we call out deniers, take local actions, and support the President's plan.
- The CO<sub>2</sub> reduction technology is here and is becoming more efficient and less expensive.

- The Intergovernmental Panel on Climate Change (IPCC) and other organizations continue to educate our decision makers and general population on the science, the issues, and adaptation and mitigation actions we can take.

**The following events occurred in 2014 and 2015:**

- At the national level the EPA released the Clean Power Plan in June 2014, which was finalized in 2015. This sent a message to the US and the international community that our president is serious about confronting climate change. This plan will reduce US CO2 pollution 30% by 2030. The plan is realistic, flexible, accountable, and economically feasible, and it can be implemented in every state.
- 400,000 people attended the New York City Climate Change Rally in September 2014.
- The US and China reached a historic climate change deal in November 2014, vowing to cut emissions.
- The South America Climate Change Conference was held in December 2014, laying the groundwork for the UN Climate Change Meetings in Paris in November 2015.
- The Pope issued a lengthy message on Climate Change to the world's 1.2 billion Catholics, and he addressed the UN Climate Change meeting in Paris.

**Messages:**

- In 2015 our international message was to gather support for the UN Climate Change meeting in Paris in November 2015. Countries had agreed to conclude a new post-Kyoto international climate change treaty at this UN climate change meeting in 2015, with such an agreement to be implemented by 2020. The Kyoto Protocol is an international treaty, which extended the 1992 United Nations Framework Convention on Climate Change (UNFCCC). The Kyoto Protocol treaty was negotiated in December 1997 at the city of Kyoto, Japan and came into force February 16th, 2005. Its intent was to be effective from 2008-2012.
- Our main national message continues to try to influence Climate Change Deniers in the US House and Senate, nudging those sitting on the fence, and supporting those who want to address the challenges of dealing with Climate Change.
- Our main Illinois message will be creating jobs, growing the economy, and letting Illinois lead the Midwest into the clean energy future. We continue to engage with state legislators and the governor to influence them to approve the state plan and be champions in demanding a strong Clean Power Plan for Illinois. The strategy may evolve as our new governor's position becomes clearer.

**International Accomplishment in 2015:**

- In November 2015 COP21 in Paris implements new approach to climate change.
- The climate change Conference of Parties (COP) governs the international environmental treaty called the "United Nations Framework Convention on Climate Change (UNFCCC). In 1992 the UNFCCC, consisting of 195 countries and the EU, adopted a treaty in Rio de Janeiro, and it has met annually since 1995. The UNFCCC does not set international binding limits to greenhouse gas pollutants or include enforcement mechanisms. Instead, protocols and other legal instruments are negotiated to set limits and set rules. Major protocols adopted include the 1997 Kyoto Protocol, the 2009 Copenhagen Accord, and the 2010 Cancun Agreement that global warming should be limited to 2 degrees Celsius.

- A new approach to addressing climate change was adopted at the 2013 COP19 in Warsaw, which created a framework using country specific pledges known as “Intended Nationally Determined Contributions (INDC)”. In Paris every country in the world outlined its INDC targets and actions it intends to take to reduce its emissions beginning in 2020. These objectives will be updated every five years, and will become more ambitious as costs, efficiencies and technologies to reduce greenhouse emissions improve. These will be reviewed and subject to public pressure.
- The UNFCCC was able to reach this agreement because the US, along with developing countries such as China, was a leader. The US was able to lead due to climate change initiatives achieved in the US in the last five years, which have created respect and credibility in the international community. Developing countries have been given a great opportunity to address health (smog), economic and employment issues. This agreement is a landmark watershed accomplishment, and the real work will now begin.

#### **Going forward into 2016:**

- Climate change will be a major issue in the 2016 national, state and local elections.
- Continue to work on the clean power plan state by state.
- Continue to support the international COP21 agreement.

#### **In conclusion:**

As individuals it is important to work with grass roots organizations such as the Sierra Club, Organizing for Action, the Climate Reality Project, Citizens Climate Lobby, Illinois Solar Energy Association (ISEA), 350.org, Faith in Place, IRON, the NW Suburban Interfaith Environmental Group, local faith organizations, as well as other environmental groups, which will be partnering on many fronts.

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**The following six videos provide additional insight. Total of 32 minutes**

- “Climate 101” with Bill Nye (4 minutes 33 seconds)

<http://climaterealityproject.org/climate-101>

- Chasing Ice – Largest Glacier Calving ever caught on camera (4 minutes 41 seconds)

<https://www.youtube.com/embed/hC3VTgIPoGU?rel=0>

- Fact Check Time – 13 Claims followed by the facts – Written explanation and video (6 minutes 49 seconds)

<http://www.upworthy.com/you-might-be-tempted-to-hate-the-guy-in-the-sunglasses-until-you-realize-who-he-is?c=recon1>

- More on the 97% consensus on climate change which is actually 99.9% (8 minutes)

<http://www.msnbc.com/msnbc/how-climate-change-deniers-got-it-very-wrong>

- Creating Doubt (5 minutes 11 seconds)

<http://climaterealityproject.org/video/doubt>

- Creating Doubt - Article: Deniers are not skeptics"

[http://www.csicop.org/news/show/deniers\\_are\\_not\\_skeptics](http://www.csicop.org/news/show/deniers_are_not_skeptics)

- There is hope –EPA Clean Power Plan (3 minutes 15 seconds)

[https://www.youtube.com/watch?v=AcNTGX\\_d8mY&feature=youtu.be](https://www.youtube.com/watch?v=AcNTGX_d8mY&feature=youtu.be)