

**The Week That Was: 2016-11-05 (November 5, 2016)**  
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**The Science and Environmental Policy Project**

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**Quote of the Week.** *“The miracle of the appropriateness of the language of mathematics for the formulation of the laws of physics is a wonderful gift which we neither understand nor deserve.”* – Eugene Wigner

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**Number of the Week:** One Billion People

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**THIS WEEK:**

***By Ken Haapala, President, Science and Environmental Policy Project (SEPP)***

**Svensmark Hypothesis Criticized:** The Svensmark hypothesis that high energy cosmic rays can be a building block for cloud formation has been demonstrated in the laboratory, most recently by CERN. The cosmic rays are modulated by changes in solar wind, which are the result of solar activity. The activity of the sun is estimated by frequency and intensity of sunspots. An active sun results more solar wind and a corresponding net decrease in cloud formation. A dormant sun results in less solar wind and a corresponding net increase in cloud formation and a corresponding decrease in temperatures. This hypothesis is consistent with earlier thoughts about conditions in Europe during the Little Ice Age, when the skies were cloudy, winters were cold, and crops did not ripen, resulting in periods of famine.

The hypothesis has been criticized by a group headed by Eimear M. Dunne, part of the extensive CERN team, claiming that the Svensmark Hypothesis is insufficient to explain variation in cloud formation in global models. The gas-phase chemistry models for cloud formation are sufficient. Based on review of the abstract, it appeared that the researchers were using numerical (statistical) techniques to match data with the model, the numerical model being the paramount concept.

The procedure entails the significant assumption that the model is complete and valid. The assumption is highly questionable because the treatment of clouds in the global climate models is highly questionable and in need of improvement. Cloud formation is important not only due to the reflective capability of low-lying clouds resulting in less solar energy hitting the surface; but also, in the transfer of latent heat during the phase change of liquid water into water vapor, at the surface – then phase change of water vapor condensing into water droplets in the atmosphere. The phase change of liquid to gas absorbs heat, and the phase change of gas into liquid releases heat.

The Svensmark group at the Technical University of Denmark has responded to this challenge from the Dunne group, identified as CLOUD. The response starts with: “It is important to note that the new CLOUD paper is not presenting an experimental result, with respect to the effect of cosmic ray generated ions on clouds, but a result of numerical modeling.” The Svensmark response further states: “This type of numerical modeling is by no means new, and neither is the result that ions in these models apparently do not affect cloud formation. We have known this for about 7 years.” The conclusions are similar to other numerical model driven criticisms.

But, in the laboratory the hypothesis works. So, the real issue becomes what happens in the field – the atmosphere. There, nature provides an important experiment – Forbush decreases.

Forbush decreases occur when solar, coronal mass ejections result in plasma cloud (solar wind) passing the earth resulting in a significant drop in cosmic ray flux. Large drops in the cosmic ray flux result in a decrease in cloud formation (with a delay, a lag). The very tight statistical correspondence, with a lag of several days, between a major drop in cosmic rays and a major decrease in cloud formation indicates these are important events, events that general, smoothed numerical analysis may or may not capture.

As Svensmark states: “In conclusion, observations and experiments go against the above mentioned numerical model result. As I see it, something is missing in the prevailing theory. A solution to this problem is still worth pursuing.”

This exchange of ideas emphasizes an important step in the development of empirical knowledge. Since Galileo asserted that mathematics, not Latin, is the language of science, Western Empirical Science has relied heavily on mathematics, as illustrated in the quote above and last week’s TWTW quote from Einstein. But, numerical manipulation, mathematics, does not necessarily constitute knowledge. The knowledge comes from observations, both in the laboratory (experiment) and in the field. Even the most advanced computers cannot numerically create knowledge, the results must be verified by observations. See links under Science: Is the Sun Rising?

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**Antarctica Melting?** Some US government agencies are blaming the possible melting of the West Antarctic Ice Sheet on carbon dioxide (CO<sub>2</sub>), creating fear of a sudden increase in sea levels. Geologist James Edward Karnis takes exception. In a coherent presentation, he produces evidence that the melting of the glaciers on the ice sheet, which is occurring in some glaciers, is the result of geological heat flow, not CO<sub>2</sub> warming.

The deep earth, high geothermal heat flow in West Antarctica is associated with segments of the West Antarctic Fault / Rift System. The 5,000 mile-long (8,000 km) fault / rift system divides into two segments roughly at the tip of the Antarctic Peninsula, south of the Drake Passage. The west segment roughly follows the western part of the peninsula, then the Antarctic coast line and the east segment roughly follows the eastern part of the peninsula and the west edge of the Weddell Sea until it crosses the western part of the continent to the east edge of the Ross Sea, then out into Pacific Ocean.

There are 61 active and dormant (semi-active) hot-spots / volcanoes along this fault / rift system. (Iceland comes to mind as similar geothermal activity.) Further, many of the national and international Antarctic exploration stations are located at or near this fault / rift system, rendering surface temperature measurements questionable.

Karnis also brings up that: “Overall ice mass and extent of Antarctica has increased for 35 years. This strongly implies that Earth’s supposedly anomalously warmed atmosphere is not having any noticeable or direct effect on this continent’s glaciers. Glaciers, other than the ones being studied, are growing, not melting. And “most importantly, the role that geologically induced deep earth heat flow and chemically charged heated fluid flow likely play in bottom melting the three studied West Antarctic glaciers (Pope, Smith, Kohler) is not considered or even mentioned by those performing the research.”

These omissions by NOAA and NASA are serious and strange. See links under Challenging the Orthodoxy.

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**Methylmercury from Bacteria?** Methylmercury is an organic compound of mercury that is often associated with eating fish and shellfish. Serious damage to the central nervous system (brain and spinal cord) may occur from eating large quantities. A noted example occurred by eating fish from Minamata Bay in Japan. [Inorganic (elemental) mercury far less toxic than methylmercury.] The EPA has used the fear of mercury in its campaign against burning coal and other fossil fuels. The EPA's studies of toxicity justifying this campaign are dubious at best.

In his discussion on the West Antarctic Rift / Fault system, Karnis cites studies that show methylmercury is produced by bacteria in geothermal vents. Other locations include lakes, rivers, soils and the open ocean.

Although methylmercury is naturally occurring, many researchers have mistaken its presence as evidence of burning of fossil fuels from far-away power plants. See links under Changing Earth.

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**Easterbrook's Book:** The second edition of Don Easterbrook's book, "Evidence-Based Climate Science: Data Opposing CO2 Emissions as the Primary Source of Global Warming" is available. It includes data from experts in meteorology, geology, atmospheric physics, solar physics, geophysics, climatology, and computer modeling. The promotional material states:

*"Increasingly, scientists are pointing to data which suggests that climate changes are a result of natural cycles, which have been occurring for thousands of years. Unfortunately, global warming has moved into the political realm without enough peer-reviewed research to fully validate and exclude other, more natural, causes of climate change. For example, there is an absence of any physical evidence that CO2 causes global warming, so the only argument for CO2 as the cause of warming rests entirely in computer modeling. Thus, the question becomes, how accurate are the computer models in predicting climate? What other variables could be missing from the models?"*

Of course, the variables missing from the global climate models are a focus of TWTW. See links under Challenging the Orthodoxy.

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**Supreme Court Justice Thomas:** To many "court watchers", Supreme Court Justice Clarence Thomas remains an enigma. In hearing cases, seldom he asks questions, or gives any indication of his leanings, or his thinking. Yet, many court watchers agree that he is exceptionally clear and forceful in his writing and his thinking, even if one may not agree. Perhaps that is why some people resort to personal attacks, because they cannot contend with him on his level.

In a rare public interview, Justice Thomas answered a variety of questions. Given the discussion on the Administration's Power Plan, at the US Court of Appeals, presented in last week's TWTW, of interest was a question on amicus briefs (friends-in-court). Thomas cited one by electrical engineers that explained the electrical grid to justices in a way the parties in the case failed to do. This remark prompted a search for the brief, which may have uncovered the correct one.

From a review of the 2001 brief, one can surmise that electricity on the grid is a flow of electrical energy, owned by no one, yet benefiting all who receive it. It is the energy that is transmitted, not electrons, and energy flowing onto a power grid energizes the entire grid. "A networked electric grid flexes, and electric current flows, in conformity with physical laws, and those laws do not notice, let alone conform to, political boundaries. If the transmission lines of the system cross state boundaries, then electric currents on the system necessarily do likewise."

This prompts the unanswered question who is responsible for maintaining the flow of energy. The attorneys representing those suing the administration argue that the states and utilities generating the power are responsible. The administration has remained silent as to responsibility of maintaining the flow of energy, and has advocated power generation that is well-known to be interrupted, without warning. If the case goes to the Supreme Court, it will be interesting to see how Justice Thomas views the issues, including the public health and welfare issues. See links under Other News that May Be of Interest.

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**Technology Breakthroughs:** Writing for *Real Clear Politics* Rob Tracinski notes a catch in virtually all renewable electricity schemes: “There's a long distance from a theoretical breakthrough to a technology with predictable costs that justifies enormous investments in new energy infrastructure.”

*“The problem with future technology is that it's in the future. It requires technological breakthroughs that haven't happened yet. For industrial-scale power generation, the kind that can support a First World lifestyle, that's a big problem, because to replace existing systems requires construction on a vast scale and investments of trillions of dollars.”*

Energy storage is a big issue with solar and wind. “There are three basic issues with battery storage: energy density, recharge times, and the total battery life cycle.” Each issue has its own uncertainties.

By committing to solar and wind, with heavy subsidies, politicians are gambling on technological breakthroughs, which may or may not occur, and are not predictable. Individuals, or companies may do so, and suffer the consequences if they fail or receive rewards if they succeed – as did such as George Mitchell in hydraulic fracturing. Politicians gambling on technological breakthroughs in setting policy are gambling with public health and welfare and the huge financial drains on the public through taxes and utility bills – a different level of risks. See links under Energy Issues – Non-US

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**Paris Agreement:** According to the UN, and its supports, the Paris agreement is in effect. What that means to the US, and other countries that have promised to reduce CO2 emissions, who knows?

A treaty is legally enforceable in the US. Mr. Obama ignored the process of a legal enforceable treaty. The administration calls the Paris Agreement an executive agreement. Is an executive agreement legally enforceable in the US – particularly if Congress has not approved it?

The US election on November 8, may change everything. The US courts may change everything. The US administration's arrogance in ignoring the US Congress, may change everything. Rather than leaving office with a legacy, Mr. Obama will leave office with a cloud of regulatory murk, that may employ lawyers for many years to come. See links under After Paris!

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**Additions and Corrections:** Reader Stefan Björklund sent a photo of a building taken at a UN IPCC conference. The solar panels on the roof of the building were covered in snow. In the email the words “Dunkelflaute” and “Schneeflaute” appeared. Upon inquiry, Mr. Björklund responded that in German, “Flaute” means in business language there is a stagnation. “Dunkelflaute” means

solar panel production is in stagnation due to darkness. We can all guess what “Schneeflaute” means.

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**Number of the Week: One Billion People.** The February 14, 2009 TWTW reported that John Holdren testified at his Senate confirmation hearing to be the president's chief science advisor that global warming will kill one billion people in a decade. This is the caliber of scientist Mr. Obama was referencing when he spoke: “Scientists say ....”

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### **NEWS YOU CAN USE:**

#### ***Science: Is the Sun Rising?***

##### **Henrik Svensmark: Cosmic Rays And Clouds Anno 2016**

By Henrik Svensmark, DTU Space, National Space Institute, Technical University of Denmark, Oct 30, 2016

<http://www.thegwpc.com/henrik-svensmark-cosmic-rays-and-clouds-anno-2016/>

Link to questionable paper: Global atmospheric particle formation from CERN CLOUD measurements

By Eimear M. Dunne, et al. Science, Oct 27, 2016

<http://science.sciencemag.org/content/early/2016/11/01/science.aaf2649>

Link to praise of the Dunne paper: Sun-clouds-climate connection takes a beating from CERN

By John Timmer, Ars Technica, Oct 28, 2016

<http://arstechnica.com/science/2016/10/sun-clouds-climate-connection-takes-a-beating-from-cern/>

Main paper: The response of clouds and aerosols to cosmic ray decreases

By J. Svensmark, M. B. Enghoff, N. J. Shaviv, and H. Svensmark, National Space Institute and Racah Institute of Physics, Hebrew University, J. Geophysical. Research. Space Physics, 121, 8152–8181, (2016), doi:10.1002/2016JA022689.

[https://dl.dropboxusercontent.com/u/51188502/Forbush\\_long\\_JGR\\_rev3\\_nored.pdf](https://dl.dropboxusercontent.com/u/51188502/Forbush_long_JGR_rev3_nored.pdf)

#### ***Commentary: Is the Sun Rising?***

##### **Sun quiet again as it heads toward solar minimum**

By Paul Dorian, Vencore Weather, Oct 31, 2016

<http://www.vencoreweather.com/blog/2016/10/31/1040-am-sun-quiet-again-as-it-heads-towards-solar-minimum>

#### ***Challenging the Orthodoxy -- NIPCC***

##### **Nature, Not Human Activity, Rules the Climate**

S. Fred Singer, Editor, NIPCC, 2008

[http://www.sepp.org/publications/nipcc\\_final.pdf](http://www.sepp.org/publications/nipcc_final.pdf)

#### **Why Scientists Disagree About Global Warming**

The NIPCC Report on the Scientific Consensus

By Craig D. Idso, Robert M. Carter, and S. Fred Singer, NIPCC, Nov 23, 2015

<http://climatechangereconsidered.org/>

Download with no charge

<https://www.heartland.org/policy-documents/why-scientists-disagree-about-global-warming>

#### **Climate Change Reconsidered II: Physical Science**

Idso, Carter, and Singer, Lead Authors/Editors, 2013

<https://www.heartland.org/media-library/pdfs/CCR-II/CCR-II-Full.pdf>

Summary: <http://www.nipccreport.org/reports/ccr2a/pdf/Summary-for-Policymakers.pdf>

### **Climate Change Reconsidered II: Biological Impacts**

Idso, Idso, Carter, and Singer, Lead Authors/Editors, 2014

<http://www.nipccreport.org/reports/ccr2b/pdf/Full-Report.pdf>

Summary: <https://www.heartland.org/media-library/pdfs/CCR-IIb/Summary-for-Policymakers.pdf>

### ***Challenging the Orthodoxy***

#### **Evidence-Based Climate Science, 2nd Edition**

Data Opposing CO2 Emissions as the Primary Source of Global Warming

By D. Easterbrook, Sep 29, 2016

<http://store.elsevier.com/Evidence-Based-Climate-Science/isbn-9780128045886/>

#### **“Clear Mismatch Between Climate Models And Paleoclimate Data,” New Peer-Reviewed Book Finds**

By P Gosselin, No Tricks Zone, Oct 29, 2016

<http://notrickszone.com/2016/10/29/clear-mismatch-between-climate-models-and-paleoclimate-data-new-peer-reviewed-book-finds/>

*[SEPP Comment: Review of Easterbrook’s book, above link.]*

#### **West Antarctic Glacial Melting From Deep Earth Geological Heat Flow Not Global Warming**

By James Edward Kamis, Climate Change Dispatch, Nov 3, 2016 [H/t Paul Homewood]

<http://climatechangedispatch.com/west-antarctic-glacial-melting-from-deep-earth-geological-heat-flow-not-global-warming/>

#### **How Far Will Global Temperature Drop After El Nino?**

By David Whitehouse, GWPF, Nov 3, 2016

<http://www.thegwpf.com/how-far-will-global-temperature-drop-after-el-nino/>

#### **The Stern Review ten years on**

By Peter Lilley and Richard Tol, GWPF, 2016

<http://www.thegwpf.org/content/uploads/2016/10/Stern10b-2.pdf>

*[SEPP Comment: A critical analysis of Stern’s economic advocacy, which supported a preconceived conclusion. It prompts questioning of all government reports demanding punitive economic measures.]*

### ***Defending the Orthodoxy***

#### **When Does Skepticism Become Bias In Science?**

By Marshall Shepherd, Forbes, Nov 1, 2016 [H/t Clyde Spencer]

<http://www.forbes.com/sites/marshallshepherd/2016/11/01/when-does-skepticism-become-bias-in-science/#4074ff4ce16e>

*[SEPP Comment: When does acceptance of un-validated models become objective? Is making multiple accusations with no evidence not called consilience?]*

### ***Questioning the Orthodoxy***

#### **Annals Of Fake, Politicized "Science"**

By Francis Menton, Manhattan Contrarian, Oct 26, 2016

<http://manhattancontrarian.com/blog/2016/10/25/annals-of-fake-politicized-science>

**Christopher Essex and Matt Ridley: IPCC, Climate Science And The Crisis of Peer Review**  
Foreword to Donna Laframboise's new report Peer Review: Why Skepticism is Essential  
GWPF, Oct 31, 2016

<http://www.thegwpf.com/christopher-essex-and-matt-ridley-ipcc-climate-science-and-the-crisis-of-peer-review/>

**How Economists Had the Best Tools for a Basic Understanding of Climate All the Time but Failed to Use Them until Very Recently**

Alan Carlin, Carlin Economics and Science, Nov 3, 2016

<http://www.carlineconomics.com/archives/3118>

“One of the curious things about climate economics is that a number of climate economists have spent considerable time and effort to try to develop a concept called the Social Cost of Carbon (SCC), but have only very recently asked whether the basic alarmist hypotheses concerning the effects of carbon dioxide (CO<sub>2</sub>) are correct. If the basic relationships are wrong, **time spent guessing at SCC values is nothing more than idle speculation.**”

**When Asked To Show Evidence Of Man-Made Warming, Scientists Can't Do It**

By Kerry Jackson, IBD, Oct 25, 2016

<http://www.investors.com/politics/commentary/when-asked-to-show-evidence-of-man-made-warming-scientists-cant-do-it/>

**Willis and I are presenting at AGU's fall meeting – assistance requested from WUWT readers**

By Anthony Watts, WUWT, Nov 3, 2016

<https://wattsupwiththat.com/2016/11/03/willis-and-i-are-presenting-at-agus-fall-meeting-assistance-requested-from-wuwt-readers/>

From the abstract: “An investigation was conducted utilizing the Remote Sensing Systems (RSS) 1°x1° gridded total precipitable water (TPW) dataset to determine the magnitude of upwelling long-wave infrared radiation from Earth's surface since 1988. TPW represents the mass of water vapor in a 1 meter by 1 meter column from the surface to the top of the atmosphere. As referenced in IPCC AR5 WGI Box 8.1, the radiative effect of absorption by water vapor is roughly proportional to the logarithm of its concentration. Therefore it is the fractional change in water vapor concentration, not the absolute change, that governs its strength as a climate forcing mechanism.”

***After Paris!***

**Climate Headed for Catastrophic Change Despite Paris Accord**

By Jessica Shankleman, Bloomberg, Nov 3, 2016

<http://www.bloomberg.com/news/articles/2016-11-03/world-climate-headed-for-catastrophic-change-despite-paris-deal>

**Russia does not plan to ratify Paris Agreement on climate earlier than 2020 — minister**

By Staff Writers, Philippines News Agency, Oct 29, 2016 [H/t GWPF]

<http://news.mb.com.ph/2016/10/29/russia-does-not-plan-to-ratify-paris-agreement-on-climate-earlier-than-2020-minister/>

**Shock...Germany To Come To Marrakesh Conference Empty-Handed! Withdraws Climate Protection Plan!**

By P Gosselin, No Tricks Zone, Nov 1, 2016

<http://notrickszone.com/2016/11/01/shock-germany-comes-to-marrakesh-conference-empty-handed-withdraws-climate-protection-plan/>

[SEPP Comment: The upcoming UN conference after the Paris agreement.]

### ***The Administration's Plan***

#### **Oil industry warns of late Obama regulation push**

By Devin Henry, The Hill, Nov 1, 2106

<http://thehill.com/policy/energy-environment/303779-oil-industry-warns-of-late-obama-regulation-push>

### ***The Administration's Plan – Push-Back***

#### **Obama's Electric Car Money Grab**

The president can avoid Congress by using fines on private companies like Volkswagen to fund his pet projects.

By William Yeatman, WSJ, Nov 1, 2016

<http://www.wsj.com/articles/obamas-electric-car-money-grab-1478041904>

### ***Review of Recent Scientific Articles by CO2 Science***

#### **The Role of Solar Forcing in Australian Tropical Cyclone Activity**

Haig, J.E.-A. and Nott, J. 2016. Solar forcing over the last 1500 years and Australian tropical cyclone activity. *Geophysical Research Letters* **43**: 2843-2850. Nov 4, 2016

<http://www.co2science.org/articles/V19/nov/a3.php>

“The apparent weakness of these models, according to the two Australian researchers, is the short length of the indices they utilize (usually less than 50 years), which fail to capture larger-scale climatic drivers that vary on centennial to millennial time scales.”

“In commenting on their findings, Haig and Nott write that ‘the link between tropical cyclone activity in Western and Eastern Australia and solar cycles at decadal and centennial scales is certainly compelling.’”

#### **The Interaction of Elevated CO2, Drought and UV-B Stress on Maize**

Wijewardana, C., Henry, W.B., Gao, W. and Reddy, K.R. 2016. Interactive effects of CO2, drought, and ultraviolet-B radiation on maize growth and development. *Journal of Photochemistry & Photobiology, B: Biology* **160**: 198-209. Nov 2, 2016

<http://www.co2science.org/articles/V19/nov/a2.php>

#### **The Impact of Ocean Acidification on Japanese Carpet Shell Clams**

Velez, C., Figueira, E., Soares, A.M.V.M. and Freitas, R. 2016. Combined effects of seawater acidification and salinity changes in *Ruditapes philippinarum*. *Aquatic Toxicology* **176**: 141-150. Nov 1, 2016

<http://www.co2science.org/articles/V19/nov/a1.php>

“Focusing primarily on pH, the authors report that at each tested salinity, ‘similar physiological and biochemical responses were found in clams under both tested pH levels, indicating that pH may have less impacts on clams than salinity.’ Such findings would therefore appear to be good news; ocean acidification will likely neither harm nor impair this important bivalve species.”

### ***Measurement Issues -- Surface***

**Revealed: IPCC Adds 0.3°C Of Phantom Warming Between 3rd, 5th Reports ... Met Office Removes 0.3°C From 1880s-1940s Warming**



By Kenneth Richard, No Tricks Zone, Oct 3, 2016

<http://notrickszone.com/2016/10/31/revealed-ipcc-adds-0-3c-of-phantom-warming-between-3rd-5th-reports-met-office-removes-0-3c-from-1880s-1940s-warming/>

### **Study: plants found to be sensitive to nighttime temps, bud earlier**

By Anthony Watts, WUWT, Oct 28, 2016

<https://wattsupwiththat.com/2016/10/28/study-plants-found-to-be-sensitive-to-nighttime-temps-bud-earlier/>

*[SEPP Comment: WUWT adds two revealing graphs: Average Annual **Maximum** Temperature for Las Vegas since 1937 and Average Annual **Minimum** Temperature for Las Vegas since 1937.]*

### **Measurement Issues -- Atmosphere**

#### **UAH Global Temperature Update for October 2016: +0.41 deg. C**

October Temperature Down a Little from September

By Roy Spencer, His Blog, Nov 1, 2016

<http://www.drroyspencer.com/2016/11/uah-global-temperature-update-for-october-2016-0-41-deg-c/>

#### **Why Surface Wind Measurements in Hurricanes Don't Match Satellite Estimates**

By Philip Klotzbach, WUWT, Oct 27, 2016

<https://wattsupwiththat.com/2016/10/27/why-surface-wind-measurements-in-hurricanes-dont-match-satellite-estimates/>

“Discussion of near impossibility of actually recording strongest winds in a hurricane.

“Hurricane intensity is not exaggerated to scare people, and here’s how we know.”

### **Measurement Issues – Missing Heat**

#### **Clouds are impeding global warming for now**

By Staff Writers. Livermore CA (SPX) Nov 02, 2016

[http://www.terraily.com/reports/Clouds\\_are\\_impeding\\_global\\_warming\\_for\\_now\\_999.html](http://www.terraily.com/reports/Clouds_are_impeding_global_warming_for_now_999.html)

Link to paper: Impact of decadal cloud variations on the Earth’s energy budget

By Zhou, Zelinka, & Klein, Oct 31, 2016

<http://www.nature.com/ngeo/journal/vaop/ncurrent/full/ngeo2828.html>

### **Changing Climate**

#### **Corals Reveal Ancient Ocean Temperatures in Great Barrier Reef**

Old coral colonies suggest that a prehistoric warming event called the mid-Holocene Thermal Maximum may have occurred earlier than previously thought.

By Sarah Stanley, EOS, Oct 27, 2016

<https://eos.org/research-spotlights/corals-reveal-ancient-ocean-temperatures-in-great-barrier-reef>

### **Changing Seas**

#### **Scientific Studies Reveal No Correlation Between CO2 And Ocean Heat Content Variations For 99.975% Of The Last 10,000 Years**

By Kenneth Richard, No Tricks Zone, Nov 3, 2016

<http://notrickszone.com/2016/11/03/scientific-studies-reveal-no-correlation-between-co2-and-ocean-heat-content-variations-for-99-975-of-the-last-10000-years/>

*[SEPP Comment: The precision is false. We have no measurements of the heat content of seas in years past, or even today.]*

### ***Changing Cryosphere – Land / Sea Ice***

#### **Study: ‘accelerated melting of the lower Greenland ice sheet’ due to bacteria darkening the surface albedo**

By Anthony Watts, WUWT, Nov 1, 2016

<https://wattsupwiththat.com/2016/11/01/study-accelerated-melting-of-the-lower-greenland-ice-sheet-due-to-bacteria-darkening-the-surface-albedo/>

Link to paper: Microbial community variation in cryoconite granules on Qaanaaq Glacier, NW Greenland

By Jun Uetake, et al. FEMS Microbiology Ecology, June 14, 2016

<http://femsec.oxfordjournals.org/content/92/9/fiw127>

#### **West Antarctic Glacial Melting From Deep Earth Geological Heat Flow Not Global Warming**

By Paul Homewood, Not a Lot of People Know That, Nov 4, 2016

<https://notalotofpeopleknowthat.wordpress.com/2016/11/04/west-antarctic-glacial-melting-from-deep-earth-geological-heat-flow-not-global-warming/>

#### **Accelerated glacier melting in West Antarctica documented**

Study findings will help improve predictions about global sea level rise

By Staff Writers, Science News, Oct 25, 2016

<https://www.sciencedaily.com/releases/2016/10/161025113327.htm>

Link to paper: Grounding line retreat of Pope, Smith, and Kohler Glaciers, West Antarctica, measured with Sentinel-1a radar interferometry data

By B. Scheuchi, et al, GRL, Aug 28, 2016

<http://onlinelibrary.wiley.com/doi/10.1002/2016GL069287/abstract;jsessionid=CE2B212F7B5AC06F0E744F29ACB3250A.f01t02>

[SEPP Comment: See link immediately above.]

### ***Changing Earth***

#### **Volcanic Activity Supplies ‘Natural’ Mercury To Antarctic Glaciers, Not Humans**

By James Edward Kamis, Climate Change Dispatch, Sep 7, 2016

<http://climatechangedispatch.com/volcanic-activity-supplies-natural-mercury-to-antarctic-glaciers-not-humans/>

Link to paper: Mercury Adaptation among Bacteria from a Deep-Sea Hydrothermal Vent

By Costantino Vetriani, et al. Applied and Environmental Microbiology, Jan 2005

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC544242/>

#### **Study shows temperatures rising in Yellowstone Lake vents**

By Staff Writers, Salt Lake Tribune, Oct 30, 2016 [H/t Clyde Spencer]

<http://www.sltrib.com/home/4521830-155/study-shows-temperatures-rising-in-yellowstone>

### ***Acidic Waters***

#### **Research Highlight: Automated System Advances Study of Chemical ‘Pulse’ of Coral Reefs**

Field study successfully tests a new tool for tracking ocean acidification

By Samantha Jones, Scripps, Oct 4, 2016

<https://scripps.ucsd.edu/news/research-highlight-automated-system-advances-study-chemical-pulse-coral-reefs>

### ***Agriculture Issues & Fear of Famine***

## **GMO Crops Attacked by Knowledge-Resistant NYT Journalist Danny Hakim**

By Alex Berezow, ACSH, Oct 31, 2016

<http://acsh.org/news/2016/10/31/gmo-crops-attacked-knowledge-resistant-nyt-journalist-danny-hakim-10385>

“For instance, he largely restricts his analysis to the U.S., Canada, and Western Europe while ignoring the rest of the planet. That's a telling omission. Rich countries have excellent agricultural infrastructures and so have less to gain from GMOs than developing countries.”

### ***Lowering Standards***

#### **Claim: Arctic sea ice is losing its bulwark against warming summers**

By Anthony Watts, WUWT, Oct 29, 2016

<https://wattsupwiththat.com/2016/10/29/claim-arctic-sea-ice-is-losing-its-bulwark-against-warming-summers/>

### ***Communicating Better to the Public – Make things up.***

#### **Greenhouse gas emissions set to bust global climate pact in 2030: U.N.**

By Nina Chestney and Peter Hobson, Reuters, Nov 3, 2016 [H/t Clyde Spencer]

<https://www.yahoo.com/news/greenhouse-gas-emissions-set-bust-global-climate-pact-112930784.html>

"The growing numbers of climate refugees hit by hunger, poverty, illness and conflict will be a constant reminder of our failure to deliver. The science shows that we need to move much faster."  
-- Erik Solheim, head of UN Environment.

[SEPP Comment: *Were the refugees in Europe during WW II climate refugees?*]

### ***Communicating Better to the Public – Go Personal.***

#### **WikiLeaks Exposes Podesta-Steyer Climate McCarthyism**

By Robert Bryce, National Review, Oct 26, 2016

<http://www.nationalreview.com/article/441438/wikileaks-john-podesta-silenced-climate-change-dissent>

[SEPP Comment: *Bragging about the attack on Roger Pielke, Jr.*]

### ***Expanding the Orthodoxy***

#### **White House climate panel issues resilience report**

By Devin Henry, The Hill, Oct 31, 2016

<http://thehill.com/policy/energy-environment/303585-white-house-climate-panel-issues-resilience-report>

Link to report: “Opportunities to Enhance the Nation’s Resilience to Climate Change,”  
By Staff Writers, Council on Climate Preparedness and Resilience, The White House, Oct 2016  
<https://www.whitehouse.gov/sites/default/files/finalresilienceopportunitiesreport.pdf>

### ***Questioning European Green***

#### **£11 bn Smart Meter rollout delayed again.**

By Paul Homewood, Not a Lot of People Know That, Nov 4, 2016

<https://notalotofpeopleknowthat.wordpress.com/2016/11/04/11-bn-smart-meter-rollout-delayed-again/>

### **German Fossil Fuel Consumption Trends**

By Paul Homewood, Not a lot of People Know That, Nov 4, 2016

<https://notalotofpeopleknowthat.wordpress.com/2016/11/04/german-fossil-fuel-consumption-trends/>

“Don’t get me wrong. I am not suggesting Germany is backsliding. The cost of the energiewende is real.

“But the cold fact is that, despite already spending an estimated 150 billion euros, little has actually changed.”

### ***Green Jobs***

#### **Subsidy Culture Undermines UK’s Green Industry**

By Jonathan Ford, Financial Times, Via GWPF, Oct 31, 2016

<http://www.thegwpf.com/subsidy-culture-undermines-uks-green-industry/>

“But the problem with green jobs is that they are not very valuable... In effect, each of those wind jobs had a subsidy cost of £98,000 in that year alone, paid in the currency of more expensive electricity.”

### ***Non-Green Jobs***

#### **Banning Fracking In The U.S. Would Kill 14.8 Million Jobs, Study Says**

By Andrew Follett, Daily Caller, Nov 4, 2016

<http://dailycaller.com/2016/11/04/banning-fracking-in-u-s-would-kill-14-8-million-jobs/>

Link to report: What If ... Hydraulic Fracturing Was Banned?

By Staff Writers, U.S. Chamber of Commerce, Institute for 21<sup>st</sup> Century Energy

[http://www.energyxxi.org/sites/default/themes/bricktheme/pdfs/CoC\\_BannedFracking\\_FULL\\_v3.pdf](http://www.energyxxi.org/sites/default/themes/bricktheme/pdfs/CoC_BannedFracking_FULL_v3.pdf)

*[SEPP Comment: Rough estimate.]*

#### **EPA: Coal job loss analysis could take over two years**

By Timothy Cama, The Hill, Nov 1, 2016

<http://thehill.com/policy/energy-environment/303840-epa-coal-job-loss-analysis-could-take-over-2-years>

*[SEPP Comment: More time than needed for the Endangerment Finding.]*

### ***Cap-and-Trade and Carbon Taxes***

#### **Climate Policy as ‘Bribery’: James Hansen’s Latest (gov’t failure in the quest to correct ‘market failure’)**

By Robert Bradley Jr. Master Resource, Nov 1, 2016

<https://www.masterresource.org/hansen-james/climate-policy-bribery-hansen/>

### ***Subsidies and Mandates Forever***

#### **Clean Energy Standard: Environmentally Worthless, Economically Punitive**

By Timothy Benson, IBD, Oct 28, 2016 [H/t Timothy Wise]

<http://www.investors.com/politics/commentary/clean-energy-standard-environmentally-worthless-economically-punitive/>

#### **New EPA Regulations Harm Economic Growth**

By Mike Thompson, Jefferson Policy Institute, Oct 26, 2016 [H/t Timothy Wise]

<http://www.jeffersonpolicyjournal.com/new-epa-regulations-harm-economic-growth/>

Link to Study: Evaluating the Costs and Benefits of Renewable Energy Portfolio Standards for Virginia

By Timothy Considine, National Resource Economics, Inc., Oct 2016

[http://www.thomasjeffersoninst.org/files/3/VA\\_RPS\\_2016.pdf](http://www.thomasjeffersoninst.org/files/3/VA_RPS_2016.pdf)

### ***EPA and other Regulators on the March***

#### **EPA moves forward with optional cap-and-trade system for climate rule**

By Timothy Cama, The Hill, Nov 4, 2016

<http://thehill.com/policy/energy-environment/304301-epa-moves-forward-with-optional-cap-and-trade-system-for-climate>

*[SEPP Comment: Ignore the Supreme Court!]*

### ***Energy Issues – Non-US***

#### **Knowledge Is Power: The Future of Energy**

By Rob Tracinski, Real Clear Politics, Nov 2, 2016

[http://www.realclearpolitics.com/articles/2016/11/02/knowledge\\_is\\_power\\_the\\_future\\_of\\_energy\\_132227.html](http://www.realclearpolitics.com/articles/2016/11/02/knowledge_is_power_the_future_of_energy_132227.html)

*[SEPP Comment: Seeking a better technology is part of humanity, but governments basing policy on expected success is irresponsible.]*

#### **Blowout Week 148**

By Roger Andrews, Energy Matters, Oct 30, 2016

<http://euanmearns.com/blowout-week-148/#more-15598>

“This week’s Blowout focuses on change – in particular “sea change”, which is defined by the Oxford Dictionary as a “profound or notable transformation”. Because of declining investment the world’s clean energy industry may now be in the process of having one – direction downwards:”

#### **UK Electricity 2050 Part 2: A High Nuclear Model**

By Euan Mearns, Guest Post by Alex Terrell and Andy Dawson, Energy Matters, Oct 31, 2016

<http://euanmearns.com/uk-electricity-2050-part-2-a-high-nuclear-model/>

*[SEPP Comment: The article explores issues of providing 85GW of sustained nuclear capacity throughout the winter, although, up to 121GW may be needed in very cold periods. The balance would be provided by gas or biofuels. Costs are not discussed, but comments by others provide some estimates.]*

### ***Energy Issues -- US***

#### **Dakota Access Pipeline is No Cultural or Environmental Threat**

By Craig Stevens, Real Clear Energy, Nov 4, 2016

[http://www.realclearenergy.org/articles/2016/11/04/dakota\\_access\\_pipeline\\_is\\_no\\_cultural\\_or\\_environmental\\_threat\\_110104.html](http://www.realclearenergy.org/articles/2016/11/04/dakota_access_pipeline_is_no_cultural_or_environmental_threat_110104.html)

#### **It Isn't Easy Being a Pipeline**

By Editors, Real Clear Energy, Nov 3, 2016

[http://www.realclearenergy.org/charticles/2016/11/03/it\\_isnt\\_easy\\_being\\_a\\_pipeline.html](http://www.realclearenergy.org/charticles/2016/11/03/it_isnt_easy_being_a_pipeline.html)

*[SEPP Comment: Chart showing when pipelines were built, by decades.]*

### ***Washington's Control of Energy***

#### **Regulators overhaul oil, gas drilling rules for national parks**

By Timothy Cama, The Hill, Nov 4, 2016

<http://thehill.com/policy/energy-environment/304396-regulators-overhaul-oil-gas-drilling-rules-for-national-parks>

“Oil and gas drilling is rare on NPS land and is limited to areas where a private or state landowner controls mineral rights. Drilling only happens in 12 of the 413 national parks.”  
[SEPP Comment: Another example of the administration violating agreements?]

### ***Return of King Coal?***

#### **Coal Surge Leaves China Grappling With Runaway Market It Started**

Editorial, Bloomberg, Nov 4, 2016

<http://www.bloomberg.com/news/articles/2016-11-04/coal-surge-leaves-china-grappling-with-runaway-market-it-started>

### ***Oil Spills, Gas Leaks & Consequences***

#### **GAO faults feds on key response to BP spill**

By Timothy Cama, The Hill, Oct 31, 2016

<http://thehill.com/policy/energy-environment/303623-gao-faults-feds-on-key-response-to-bp-spill>

Link to report: Interior Has Taken Steps to Address Staff Hiring, Retention, and Training but Needs a More Evaluative and Collaborative Approach

By Staff Writers, GAO, Oct 31, 2016

<http://www.gao.gov/products/GAO-16-742>

### ***Nuclear Energy and Fears***

#### **Nuclear con-fusion**

By Martin Livermore, The Scientific Alliance, Nov 4, 2016

<http://scientific-alliance.org/node/1024>

[SEPP Comment: Update on the hope for cold fusion.]

#### **The BN-800 Fast Reactor – a Milestone on a Long Road**

By Euan Mearns, Guest post by Russian commenter Syndroma, Energy Matters, Nov 4, 2016

<http://euanmearns.com/the-bn-800-fast-reactor-a-milestone-on-a-long-road/#more-15416>

#### **America Loses Another Nuclear Plant**

Editors, Real Clear Energy, Nov 2, 2016

[http://www.realclearenergy.org/charticles/2016/11/02/america\\_loses\\_another\\_nuclear\\_plant.html](http://www.realclearenergy.org/charticles/2016/11/02/america_loses_another_nuclear_plant.html)

[SEPP Comment: Useful chart of change of in-state electricity generation with loss of nuclear power plants.]

#### **Fusion reactor designs with 'long legs' show promise**

By Staff Writers, Kyoto, Japan (SPX), Oct 28, 2016

<http://www.energy->

[daily.com/reports/Fusion\\_reactor\\_designs\\_with\\_long\\_legs\\_show\\_promise\\_999.html](http://www.energy-daily.com/reports/Fusion_reactor_designs_with_long_legs_show_promise_999.html)

### ***Alternative, Green (“Clean”) Solar and Wind***

#### **Climate host Morocco advances its energy transition**

By Oliver Ristau, DW, Nov 4, 2016

<http://www.dw.com/en/climate-host-morocco-advances-its-energy-transition/a-36257369>

[SEPP Comment: The subsidies may be very interesting.]

#### **Concentrating Solar Power Isn’t Viable Without Storage, Say Experts**

By Jason Deign, Green Tech, Nov 1, 2016

<https://www.greentechmedia.com/articles/read/is-csp-viable-without-storage>

*[SEPP Comment: As compared with PV panels.]*

### **Solar Still Can't Make Money**

By Staff Writers, The American Interest, Oct 31, 2016

<http://www.the-american-interest.com/2016/10/31/solar-still-cant-make-money/>

### ***Alternative, Green ("Clean") Vehicles***

#### **Vehicular decarbonisation – two new technologies to watch**

By Rud Istvan, Climate Etc. Nov 2, 2016

<https://judithcurry.com/2016/11/02/vehicular-decarbonisation-two-new-technologies-to-watch/#more-22397>

### ***Carbon Schemes***

#### **New biochar model scrubs CO2 from the atmosphere**

By Staff Writers, Ithaca NY (SPX) Nov 02, 2016

[http://www.terradaily.com/reports/New\\_biochar\\_model\\_scrubs\\_CO2\\_from\\_the\\_atmosphere\\_999.html](http://www.terradaily.com/reports/New_biochar_model_scrubs_CO2_from_the_atmosphere_999.html)

Link to paper: Optimal bioenergy power generation for climate change mitigation with or without carbon sequestration

By Woolf, Lehmann, & Lee, Nature Communications, Oct 21, 2016

<http://www.nature.com/articles/ncomms13160>

#### **Biochar: The Sequestration Technology for Carbon Prices above \$400 / ton**

By Eric Worrall, WUWT, Oct 28, 2016

<https://wattsupwiththat.com/2016/10/28/biochar-the-sequestration-technology-for-carbon-prices-above-400-ton/>

### ***Environmental Industry***

#### **Scientists Plead with Greenpeace for Blind, Dying Children**

By Walter Donway, Savvy Street, Oct 24, 2016 [H/t WUWT]

<http://www.thesavvystreet.com/scientists-plead-with-greenpeace-for-blind-dying-children/>

*[SEPP Comment: Special pleading may not work well with those who are so skilled at it.]*

#### **Billionaire crony corporatist schemes**

Financing “green” companies and pressure groups, to get richer off taxpayers and consumers

Guest essay by Paul Driessen, WUWT, Oct 29, 2016

<https://wattsupwiththat.com/2016/10/29/billionaire-crony-corporatist-schemes/>

### ***Other Scientific News***

#### **Restoring the sense of touch in amputees using natural signals of the nervous system**

By Staff Writers, Chicago IL (SPX), Nov 02, 2016

[http://www.spacedaily.com/reports/Restoring\\_the\\_sense\\_of\\_touch\\_in\\_amputees\\_using\\_natural\\_signals\\_of\\_the\\_nervous\\_system\\_999.html](http://www.spacedaily.com/reports/Restoring_the_sense_of_touch_in_amputees_using_natural_signals_of_the_nervous_system_999.html)

#### **Record-shattering birds stay in air for 10 months: study**

By Staff Writers, Miami (AFP), Oct 27, 2016

[http://www.spacedaily.com/reports/Record-shattering\\_birds\\_stay\\_in\\_air\\_for\\_10\\_months\\_study\\_999.html](http://www.spacedaily.com/reports/Record-shattering_birds_stay_in_air_for_10_months_study_999.html)



***Other News that May Be of Interest***

**17 Things on Clarence Thomas’ Mind During Rare Public Remarks**

By Ken McIntyre, The Daily Signal, Oct 26, 2016

[http://dailysignal.com/2016/10/26/17-things-on-clarence-thomas-mind-during-rare-public-remarks/?utm\\_source=TDS\\_Email&utm\\_medium=email&utm\\_campaign=MorningBell&mkt\\_to\\_k=eyJpIjoiTVdRNE5XVm1aamN6WVdFMiIsInQiOiI3b092RFpzamhMbnFqeU5EVXRnTTU1b1lpZDExZmZvSmdWTnBOUG9qbVRRCQnNDQzI4VWczZjRiWFRkemcyRHIEcGVqVXowOGNTU2VaMVRxQUFRTVVUK25vTThqT1RqWDMwekhrZ283MVkyND0ifQ%3D%3D](http://dailysignal.com/2016/10/26/17-things-on-clarence-thomas-mind-during-rare-public-remarks/?utm_source=TDS_Email&utm_medium=email&utm_campaign=MorningBell&mkt_to_k=eyJpIjoiTVdRNE5XVm1aamN6WVdFMiIsInQiOiI3b092RFpzamhMbnFqeU5EVXRnTTU1b1lpZDExZmZvSmdWTnBOUG9qbVRRCQnNDQzI4VWczZjRiWFRkemcyRHIEcGVqVXowOGNTU2VaMVRxQUFRTVVUK25vTThqT1RqWDMwekhrZ283MVkyND0ifQ%3D%3D)

**Brief *Amicus Curiae* of Electrical Engineers, Energy Economists, and Physicists in Support of Respondents in NO. 00-568**

State of New York, v. Federal Energy Commission, et al. May 31, 2001

<http://findlawimages.com/efile/supreme/briefs/00-568/00-568.mer.ami.engineers.pdf>

[SEPP Comment: See link immediately above.]

**Researchers Just Discovered a Way to Make Supercomputing Way More Powerful**

By Sage Lazzaro, Observer, Oct 31, 2016

<http://observer.com/2016/10/researchers-just-discovered-a-way-to-make-supercomputing-way-more-powerful/>

Link to study: Doing Moore with Less – Leapfrogging Moore’s Law with Inexactness for Supercomputing

By Leyffer, et al. Prepublication draft

<https://arxiv.org/pdf/1610.02606v2.pdf>

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**BELOW THE BOTTOM LINE:**

**Holdren for Halloween (Obama’s eight-year science advisor about to go knocking on doors)**

By Robert Bradley Jr., Master Resource, Oct 31, 2016

<https://www.masterresource.org/holdren-john/holdren-halloween-obamas-eight-year-science-advisor-go-knocking-doors/>

“Some form of ecocatastrophe, if not thermonuclear war, seems almost certain to overtake us before the end of the [twentieth] century.”– John Holdren and Paul Ehrlich

**Temperature rising**

By Staff Writers, Climate Change Predictions.org, Nov 2, 2016

<http://climatechangepredictions.org/uncategorized/7310>

*Looking further ahead, our experimental decadal forecast confirms previous indications that about half the years 2010-2019 will be warmer than the warmest year observed so far – 1998.*

[Press release British Met Office 10 Dec 2009](http://www.metoffice.gov.uk/press/2009/12/10/2009121001)

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**ARTICLES:**

**1. The Phony War Against CO2**

Increased atmospheric carbon dioxide has helped raise global food production and reduce poverty.

By Rodney W. Nichols and Harrison H. Schmitt, WSJ, Oct 31, 2016

<http://www.wsj.com/articles/the-phony-war-against-co2-1477955418>

Mr. Nichols, a physicist, and Mr. Schmitt, a geologist and former Apollo 17 astronaut, co-founders of the CO2 Coalition state:



*National polls show that climate change is low on the list of voters' priorities. For good reason: In the U.S., and for much of the world, the most dangerous environmental pollutants have been cleaned up. U.S. emissions of particulates, metals and varied gases—all of these: ozone, lead, carbon monoxide, oxides of nitrogen and sulfur—fell almost 70% between 1970 and 2014.*

*Further reductions will come from improved technologies such as catalytic removal of oxides of nitrogen and more-efficient sulfur scrubbers. This is a boon to human health.*

*But a myth persists that is both unscientific and immoral to perpetuate: that the beneficial gas carbon dioxide ranks among hazardous pollutants. It does not.*

*Unlike genuine pollutants, carbon dioxide (CO<sub>2</sub>) is an odorless, colorless gas. Every human being exhales about two pounds of CO<sub>2</sub> a day, along with a similar amount of water vapor. CO<sub>2</sub> is nontoxic to people and animals and is a vital nutrient to plants. It is also a greenhouse gas which helps maintain earth at a habitable temperature.*

*Fear of excessive warming from more CO<sub>2</sub> in the atmosphere, including that released from human activity, has caused some people to advocate substantial and expensive reductions in CO<sub>2</sub> emissions. But observations, such as those on our CO<sub>2</sub> Coalition website, show that increased CO<sub>2</sub> levels over the next century will cause modest and beneficial warming—perhaps as much as one degree Celsius (1.8 degrees Fahrenheit)—and that this will be an even larger benefit to agriculture than it is now. The costs of emissions regulations, which will be paid by everyone, will be punishingly high and will provide no benefits to most people anywhere in the world.*

*In 2013 the level of U.S. farm output was about 2.7 times its 1948 level, and productivity was growing at an average annual rate of 1.52%. From 2001 to 2013, world-wide, global output of total crop and livestock commodities was expanding at an average rate of 2.52% a year.*

*This higher food security reduces poverty and increases well being and self-sufficiency everywhere, especially in the poorest parts of the developing countries. Along with better plant varieties, cropping practices and fertilizer, CO<sub>2</sub> has contributed to this welcome increase in productivity.*

*The increase of atmospheric CO<sub>2</sub> following the Industrial Revolution also has facilitated the expansion of natural vegetation into what had been barren areas, such as the edges of the Sahara and the Arctic. According to the U.N., the world will add 2.5 billion people over the next 30 years, most of them in developing countries. Feeding these people and assuring them a comfortable living standard should be among our highest moral priorities. With more CO<sub>2</sub> in the atmosphere, the challenge can and will be met.*

*National policies must make economic and environmental sense. When someone says, 'climate science is settled,' remind them to check the facts. And recall the great physicist Richard Feynman's remark: 'No government has the right to decide on the truth of scientific principles.'"*  
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## **2. Big Oil CEOs Pledge \$1 Billion to Fund Low-Carbon Technology**

Move responds to pressure on climate goals but environmentalists say it isn't enough

By Sarah Kent, WSJ, Nov 4, 2016

<http://www.wsj.com/articles/big-oil-ceos-pledge-1-billion-to-fund-low-carbon-technology-1478258955>

SUMMARY: The report states:

*“Ten of the world’s biggest oil companies plan to invest an average of \$100 million annually over the next 10 years in low-carbon technologies, the companies said Friday.*

*“The Oil and Gas Climate Initiative, which includes state-owned Saudi Arabian Oil Co., Royal Dutch Shell PLC and BP PLC, said its investments will initially focus on carbon capture and storage technology and efforts to reduce methane emissions from the oil-and-gas industry. Those efforts could significantly improve the prospects for the sector in a lower-emission world.*

*“The pledged funding is the latest sign of the oil industry’s efforts to respond to pressure from governments, activists and increasingly investors. The announcement came on the same day that a climate treaty negotiated in Paris last year by more than 200 countries to cap emissions and curb global warming comes into force, potentially limiting the use of fossil fuels such as oil and gas.*

*Environmental groups said the oil companies’ pledge of \$1 billion over a decade wasn’t close to enough and represents a tiny fraction of the group’s annual spending on finding and producing fossil fuels. It is a pledge of \$10 million a year for each company, said Jeremy Leggett, chairman of the Carbon Tracker Initiative.”*

*“The Oil and Gas Climate Initiative was created in 2014 with United Nations backing to find ways the industry can support efforts to tackle climate change while continuing to produce its reserves. Its members include giant state companies and Europe’s biggest oil producers, but not the biggest American companies, such as Exxon Mobil Corp. and Chevron Corp. Together they pump about a fifth of the world’s oil and gas output.”*

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