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CLIMATE CHANGE INSIGHTS FOR PENSION FUND TRUSTEES AND BENEFICIARIES

January 31, 2017

EVIDENCE OVER IDEOLOGY

FRIENDS OF SCIENCE
Providing Insight into Climate Science

CONTENTS

PRINCIPLE SOURCES

This report will provide evidence and insights on climate change science to counter some of the commonly held assumptions and ideology on climate change, to provide pension fund trustees and beneficiaries with information with which to make prudent choices on behalf of beneficiaries and regional/national economies.

This report is a compilation of existing climate change science, policy and economic materials drawn from work by various scientists, many of whom hold different views on climate than Friends of Science Society, but all of whom provide fresh insights on climate science and policy:

Dr. Judith Curry - Professor of Atmospheric Sciences, Georgia Tech (US Senate Testimony) (retired)

Dr. Roger Pielke, Jr. – Professor, Environmental Studies Program, Colorado State (US Senate Testimony)

Dr. John D. Harper, former director of the Geological Survey of Canada

Dr. Ross McKitrick – Professor of Economics, University of Guelph, award-winning author of "Taken by Storm," IPCC expert reviewer and climate model/carbon tax critic

Dr. Nir Shaviv – Chairman, Racah Institute of Physics, Hebrew University, Jerusalem

Dr. Ian Clark – Professor of Earth Sciences, Hydrogeology, University of Ottawa

Robert Lyman – Ottawa energy consultant, former public servant of 27-years experience and former diplomat

Dr. Madhav Khandekar – Scientific Advisor to Friends of Science Society, former research scientist with Environment Canada and past IPCC expert reviewer

Norm Kalmanovitch, P. Geoph.

Ken Gregory, B.SC. Applied Sciences

And other sources cited within.

These are our opinions based on our years of review and available evidence from many expert sources.

Friends of Science Society has been providing climate science insights since 2002. The non-profit is member funded and does not represent any industry or corporate interests. Friends of Science Society examines the evidence over the ideology on climate change science, policy and economics.

This is a plain language document intended for public education.

DEFINITIONS

Climate

The weather conditions prevailing in an area in general or over a long period [1]

Denial

Refusal to acknowledge an unacceptable truth or emotion or to admit it into consciousness, used as a defence mechanism [2]

Option

A thing that is or may be chosen [3]

Climate Change

Climate change in IPCC [Intergovernmental Panel on Climate Change] usage refers to a change in the state of the climate that can be identified (e.g. using statistical tests) by changes in the mean and/or the variability of its properties, and that persists for an extended period, typically decades or longer**. It refers to any change in climate over time, whether due to natural variability or as a result of human activity**. This usage differs from that in the United Nations Framework Convention on Climate Change (UNFCCC), where climate change refers to a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods. [4]

[1] https://en.oxforddictionaries.com/definition/climate
[2] https://en.oxforddictionaries.com/definition/denial
[3] https://en.oxforddictionaries.com/definition/option
[4] https://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html

List of Abbreviations and Terms

AGW – Anthropogenic Global Warming (human-caused) global warming thought to be caused by the gaseous emissions from the burning of fossil fuels. CAGW – Catastrophic Anthropogenic Global Warming – a term used by those who fear dire outcomes from the use of fossil fuels.

Carbon – a contemporary term used for the odorless, colorless, benign gas 'carbon dioxide' (CO_2). In scientific terms, 'carbon' is soot, the black particulate matter emitted from the burning of wood or fossil fuels.

CDP – Carbon Disclosure Project – a Rockefeller non-profit that asks corporations and cities to voluntarily report their carbon footprint.

Climate model – a computer simulation used to project future warming based on the AGW theory.

COP-21 – Conference of the Parties (numbered by sequential years of meeting). International climate conferences staged every year in a different country. The Paris Agreement was a product of COP-21.

Cosmic Rays – emanations from outer space that are admitted or blocked in varying intensity by variations in the solar cycle. Cosmic rays affect the creation of cloud cover which in turn affects warming and cooling on earth.

Current Warm Period – the present time from about 1850 to today of warming from out of the Little Ice Age. Previous warm periods include the Medieval Warm Period, Roman Optimum, Minoan Warm Period in approximately 1,000 year cycles between warm and cold going back in this Holocene Epoch.

CUPE – Canadian Union of Public Employees – Canada's largest union with some >639,000 members.

ESG – Ethical/Environmental, Social and Governance – aspects of corporate operation and due diligence that the UNPRI institutional investors review

ENGO – environmental non-governmental organization (i.e. Greenpeace, WWF, Ecojustice)

GHG – greenhouse gases – A gas that is partially opaque to the thermal infrared radiation of the earth's surface, but transparent to most sunlight.

Holocene – the epoch beginning some 12,000 to **11,500 years** ago, following the Paleolithic Ice Age up to today

KM Report – Koskie Minsky LLP *"Climate Change and Fiduciary Duties of Pension Fund Trustees in Canada"*

IPCC – Intergovernmental Panel on Climate Change

Mercer – is a global consulting leader in talent, health, retirement and investments authors of *"Long-Term Investors: Are you Aware of Your Climate Change Risk Exposure?"* referred to in the KM Report

Natural factors – climate is affected by large, inter-related naturally-caused internal variables on earth which include atmospheric oscillations (such as El Nino), volcanic activity, tidal changes, ocean currents, tectonic plate movement, geomagnetic changes, changes in atmospheric concentration of gases, variations in solar output, and changes in the earth's orbit about the sun (e.g., Milankovitch cycles).

SWF – Sovereign Wealth Fund – a national investment fund with some similarities to a union pension fund but at a national level.

SHARE - Shareholder Association for Research and Education (share.ca) touts itself as a "Canadian leader in responsible investment services, research and education."

SCC – Social Cost of Carbon – how carbon taxes are established using Integrated Assessment Models (IAMs) to calculate the 'externalities' or predicted damage to society due to the on-going use of fossil fuels. Some commentators find there is a larger social benefit than cost. SCC are disputed as they are tied to IPCC climate models which have predicted warming at rates that are 2-3 times observed temperatures. Three key models are: DICE, FUND, PAGE (See Appendix)

UNPRI – United Nations Principles for Responsible Investment – an international group of institutional investors that have developed six principles for responsible investment. Signatories to the UNPRI must 'comply' with these principles or 'explain.'

WCEL/F – West Coast Environmental Law (Foundation) – a legal-fund ENGO based in British Columbia that takes on environmental issues on behalf of diverse clients; one of their funds underwrote SHARE's report by Koskie Minsky that this document responds to.

EXECUTIVE SUMMARY

This document responds to September 2015 *"Climate Change and Fiduciary Duties of Pension Fund Trustees in Canada"* by lawyers Murray Gold and Adrian Scotchmer of Koskie Minsky LLP, issued by SHARE - Shareholder Association for Research and Education.

Tax-free pension funds, beneficent funds, foundations and Sovereign Wealth Funds (also known as institutional investors) hold sway over many policy decisions world-wide as they now have much of the world's capital in their assets under management. Originally, these fund managers were simply interested in finding worthy investments that would offer good returns over the long-term, to fund the needs of pension beneficiaries.

Since the advent of climate change activism in the early 1990's, some of these funds and their managers became concerned with the impact of investment in terms of ethical/environmental, social, and governance (ESG) issues. As foretold by management guru Peter Drucker in the 1990's, these funds have also become the dominant capital force in the market.

The growth of activist Environmental Non-Governmental Organizations (ENGOs) that publicly attacked various corporations and banks for real or perceived violations of 'social license' issues soon led to a transference of these ESG concerns to the realm of institutional investors.

In 2006, the United Nations Principles for Responsible Investment (UNPRI) was formed, a group of institutional investors and related financial organizations intent on ensuring that institutional investors sought out 'sustainable' and 'responsible' investment and that any signatory institutional investor would also commit to 'comply or explain.'

In the early days of climate change science in the Current Warm Period, there was a lock-step correlation between rising carbon dioxide (CO2) concentration in the atmosphere, human-caused industrial emissions, and a slight rise in global average temperatures from about 1970 to 1990. Thus, it was concluded by many that carbon dioxide was the main driver of global warming and that most global warming was human-caused, attributed to human industrial emissions of carbon dioxide and other so-called greenhouse gases (GHGs), from the burning of fossil fuels – oil, natural gas, and coal. It was postulated that an increase in carbon dioxide and other GHGs would create a kind of gaseous equivalent of a blanket that would heat up the earth and cause potentially catastrophic global warming. Without greenhouse gases, earth would be an unlivable, dead, cold, frozen rock in space. Without carbon dioxide, there would be no plants…and no oxygen for us to breath.

ENGOs and institutional investors began to campaign to phase-out the use of fossil fuels and to invest in alternatives and 'clean-tech' or 'low-carbon' (i.e. power generation methods such as wind and solar farms).

At first glance, the market potential looks fantastic. The world presently consumes about 17.7 Terawatts in electricity, most of which is generated by fossil fuels. (One Terawatt can power 10 billion x 100 watt light bulbs at the same time). To replace that with wind and solar farms appears to be a fantastic growth market and investment opportunity.

But few investors realized that all manufactured items, including wind turbines and solar panels, are made from vast amounts of fossil fuels, and these 'renewables' must also be backed up 100% of the time by conventional power – typically fossil fuels.

Further, the Anthropogenic (human-caused) Global Warming climate science theories of the 1990's have weakened as in 2013 the Intergovernmental Panel on Climate Change (IPCC) reported that there had been 15 years of a 'hiatus' in global warming (warming at 'values very close to zero') up to press time of 2012, despite a significant rise in carbon dioxide. Recent claims of the "hottest year ever" should be taken with a grain of salt. The margin of error in calculations means that the variation in temperature can be of +0.12°C (global warming) or -0.08°C (cooling).

Institutional investors and the UNPRI continued to promote the notion that humans are the sole cause of global warming and that 'sustainable' wind and solar are the solution. This may also have been prompted by the exceptionally profitable early deals made by wind/solar developers, wherein their investment earned guaranteed 20 year or more of income at fixed rates through various market forms like Feed-in-Tariffs or generous renewables subsidies, or the side benefits of trading 'carbon credits' or tax-write offs for certain corporations (where institutional investors held shares) for investing in 'renewables.' There are few other investment vehicles where institutional investors are guaranteed such returns over decades.

Today, institutional investors are swaying public policy in Alberta and Canada toward implementing wind and solar farms that are unsuited to this latitude and climate, and that will irresponsibly damage our economy, as is the case in Ontario. These tax-free, activist behemoths – often located off-shore - are imposing long-term burdens on the tax-paying electorate, most of whom will never reap the pension benefits of the institutional beneficiaries.

The taxpaying public is being forced into a kind of peonage – indentured servitude for infrastructure and utilities services by unaccountable and unelected institutional investors.

In Germany, the much-lauded Energy Transition – *Energiewende* – is now understood to be unsustainable.

These issues are unacknowledged by politicians and institutional investors:

1. The case for human-caused global warming has weakened. Natural forces are more influential.
2. Wind and solar cannot replace conventional power. They require 100% conventional back-up. This typically ***increases the carbon dioxide emissions,*** defeating the original purpose.
3. Economies are damaged by these subsidies and the significant rise in power prices.
4. Tax-free unelected, unaccountable institutional investors and their union beneficiaries hold sway over energy policy decisions affecting the taxpaying electorate in democratic countries.

Commenting on the blind-faith support, without doing the math on claims that battery storage will solve the intermittent, unreliable nature of wind and solar, Roger Andrews writes:

Why? I see two possible explanations. First, they are being carried along in a wave of visionary enthusiasm and haven't recognized it as a problem; second, they know about it but don't want to tell anyone because it might spell the death of large-scale storage battery research, and ultimately maybe the death of intermittent renewables too.

CLIMATE CHANGE INSIGHTS FOR PENSION FUND TRUSTEES AND BENEFICIARIES

PURPOSE OF THIS DOCUMENT

This report responds to a document of September 2015 *"Climate Change and Fiduciary Duties of Pension Fund Trustees in Canada"* [5] by Murray Gold and Adrian Scotchmer of the law firm Koskie and Minsky LLP (hereinafter "KM Report") issued by SHARE[6] wherein there is much discussion of climate change scientific and policy issues, framed in the legal context of pension fund fiduciary responsibilities as described by legal authorities in pension fund matters.

An astonishing statement is made several times in the document:

"Climate change denial is not an option."

In a country like Canada, which values freedom of speech and scientific inquiry, this statement runs contrary to both the Canadian Charter of Rights and Freedoms (S 2(b))[7] and to scientific codes of conduct of major international scientific bodies and is contrary to climate science as it is understood today. In our opinion, the statement is awkwardly phrased, false and misleading and based on outdated climate science dogma.

Tax free pension funds and tax free unions have billions of dollars at their disposal for investment and lobbying. [8] In Canada, tax-free status is typically applied to organizations that meet the "net benefit test" and related principles – in short, the organization is granted tax-free status because they are undertaking useful public functions that the government might otherwise have to establish or administer at greater cost or burden to the citizens. Consequently, it is incumbent upon pension fund trustees to balance their loyalty to beneficiaries with the good of the nation and to continuously apprise themselves of new technical or scientific information that might affect investments.

Friends of Science Society, a group of earth, atmospheric, solar scientists, Professional Engineers, economists and concerned business people, offer this report of climate science insights from experts,

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[5] https://kmlaw.ca/wp-content/uploads/2015/10/KM_Climate_Change_Paper_06oct15.pdf

[6] "SHARE" Shareholder Association for Research and Education (share.ca) touts itself as a "Canadian leader in responsible investment services, research and education." From its website, it is clear that "responsible" means that SHARE is focussed primarily on climate change, a low carbon future for everyone else, greenhouse gas reduction targets and other social issues. Shareholder value is not a priority in SHARE's world.

[7] http://laws-lois.justice.gc.ca/eng/const/page-15.html

[8] https://www.policyschool.ca/wp-content/uploads/2016/03/jogmintz-pensionwealth.pdf

written in layman's terms, to assist pension fund trustees and beneficiaries in their evaluation of climate science claims and to help plot the course of investments accordingly.

According to the National Academies Press publication "On Being a Scientist: Responsible Conduct in Research" [9] (1995) (hereinafter NAS Code of Conduct) we are told that:

> *"Science has progressed through a uniquely productive marriage of human creativity and hard-nosed skepticism, of openness to new scientific contributions and persistent questioning of those contributions and the existing scientific consensus."*[10]

This code of conduct document was produced by the Committee on Science, Engineering, and Public Policy of the National Academy of Sciences, National Academy of Engineering and Institute of Medicine.

The American Association for the Advancement of Science (AAAS) is the largest such scientific body in the world representing 24 disciplines. Its slogan is "Advancing Science, Serving Society" and offers a code of conduct document entitled "Scientific Freedom and Responsibility" by John T. Edsall (1975)[11] which states:

> *"One of the basic responsibilities of scientists is to maintain the quality and integrity of the work of the scientific community. Ideally, it is an open community—all findings should be publicly and generally available, and open to criticism, improvement, and, if necessary, rejection."*

Clearly, climate change, like any scientific matter is a matter of debate, not dogma.

CLIMATE SCIENCE OR CLIMATE POLITICS?

Authors of the KM Report refer to the Intergovernmental Panel on Climate Change (IPCC) as the authority on climate science.

Differentiating Intergovernmental Panel on Climate Change (IPCC) reports is crucial in terms of separating the *political* statements from the *scientific evidence.* Let us evaluate the sources.

The authors of the KM Report chose the 2014 IPCC Synthesis as their climate science reference point, not the IPCC AR5 Working Group I Physical Sciences report as we do. It should be noted that the IPCC Synthesis and *"Summary for Policy Maker"* (SPM) reports are very different than the science reports. These Synthesis and SPMs are ~30 page summaries of the three separate >1,000 page IPCC reports that are issued in sections addressing: Physical Sciences, Socio-Economic Impacts, Mitigation. The SPM are widely used by governments but are subject to intense political and environmental group interference, which distorts the scientific message. Author and investigative researcher Donna Laframboise has found

[9] http://www.nap.edu/openbook.php?record_id=4917&page=1

[10] http://www.nap.edu/openbook.php?record_id=4917&page=24

[11] http://archives.aaas.org/docs/1975-ScientificFreedomResponsibility.pdf

significant conflicts of interest and use of Greenpeace and WWF press release material in IPCC reports, instead of peer-reviewed science. [12] Philosopher Drieu Godefridi states the IPCC is a political body.[13]

IPCC philosopher John Broome recounts an IPCC SPM writing session: [14] [***bold*** emphasis added]

> *The whole idea of the Approval Session is extraordinary. Every single sentence of the SPM has to be either approved or rejected by* ***delegates from governments…****.*
>
> *In effect,* ***the text is edited by several hundred people sitting together in a big room****. One hundred and seven countries sent delegations of varying sizes. Saudi Arabia is said to have sent ten or more.* ***The delegates arrive with political interests****. …****At our IPCC meeting, they treated the SPM as though it were a legal document rather than a scientific report.*** *…To achieve consensus, the text of the SPM was made vaguer in many places,* ***and its content diluted to the extent that in some places not much substance remained.***

Philosopher Broome also points out that climate change is a moral issue, and therefore the need for the IPCC to employ a philosopher to assist with these matters, however, on this moral issue it appears that buying offsets has oddly become a "scientifically sound" means of dealing with vast, allegedly catastrophic, GHG emissions incurred by the IPCC in its work: [15]

> ***…To fight climate change, the IPCC finds it necessary to hold meetings in remote corners of the world.*** *Its own resources are small, so it goes wherever a government offers to fund a meeting. I have been to IPCC meetings in Lima, Changwon in South Korea, Wellington and Addis Ababa. In Europe, the IPCC has taken me to Vigo, Geneva, Oslo, Utrecht, Berlin and Potsdam. Kuala Lumpur and Copenhagen are still to come.* ***I hope the other authors offset the emissions caused by their travel to these meetings; I am pleased to say that the British government pays to offset mine.***

As shown previously, much of the IPCC's work is political in nature and not scientific.

Contrary to claims in the KM Report that all IPCC materials are peer-reviewed or "objective assessments" or that *"work that does not meet scientific standards is not promoted or endorsed by the IPCC,"* the IPCC relies on grey literature including Greenpeace-funded literature and press releases as discovered by journalist and author Donna Laframboise.

Page 6 of the KM Report says "As a result of climate change science, there is a scientific and political consensus that an increase in global average temperature beyond 2 degrees Celsius from pre-industrial levels is potentially catastrophic."

This assessment is not from the IPCC. None of the clauses quoted from the IPCC synthesis report suggest CO2-induced warming would be "catastrophic."

[12] https://friendsofscience.org/index.php?id=603
[13] https://www.amazon.com/IPCC-scientific-body-Drieu-Godefridi-ebook/dp/B00V7DMDOA
[14] https://enviroethics.org/2014/05/20/a-philosopher-at-the-ipcc/3/
[15] https://enviroethics.org/2014/05/20/a-philosopher-at-the-ipcc/2/

Thus, we must question the KM Report's view that *"climate change denial is not an option."*

WHAT IS AT STAKE?

National economies. The lives of millions of people. The future of planet earth. Pension fund beneficiaries.

Proponents of the theory of (Catastrophic) Anthropogenic Global Warming claim that moving off fossil fuels and into a 'low-carbon'[16] economy would solve the alleged outcome that an increase in human-caused carbon dioxide and other greenhouse gas emissions would make the earth warmer – some say dangerously so.

Thus, the 'go-to' solution touted by many groups is wind or solar farms to replace fossil fuels for power generation. They are mistaken. Wind turbines and solar panels use enormous amounts of oil, natural gas and coal in their production. Likewise, during operation, wind and solar farms need 100% back-up 24/7 by conventional power generation – typically coal or natural gas. Consequently, these proposed solutions are not low-carbon.

None-the-less, governments have made various pledges to move off fossil fuels in whole or in part by 2050. Are these realistic? Politicians have set a goal to "keep warming under 1.5 or 2°Celsius." Is it possible for humans to stop climate change? What would that do to our economy if we could?

Ottawa consultant, former public servant and energy economist Robert Lyman has reviewed the proposed 2°C Canadian greenhouse gas target under the Harper government and demonstrates that Canada's economy will be reduced to ashes in trying to meet such a goal. [17]

> *Reductions of this magnitude would entail almost eliminating all oil, natural gas and coal from the energy consumption mix, shutting down the oil and natural gas production, refining and processing industries, quickly constructing several new nuclear reactors, eliminating most emissions intensive industries like steel and automobile manufacturing, eliminating all emissions from waste, and sharply cutting energy use in agriculture and buildings. Access to air travel, which is totally dependent on petroleum fuels, would have to be severely limited.* ***Doing this would shrink Canada's 'carbon footprint', relative to its economy and population, to levels today seen only in poverty-stricken countries like Haiti, Afghanistan, North Korea and Chad****. It is difficult to imagine how an energy-hungry, highly developed country whose population is constantly growing through immigration could realistically cut emissions so drastically in so short a time.*

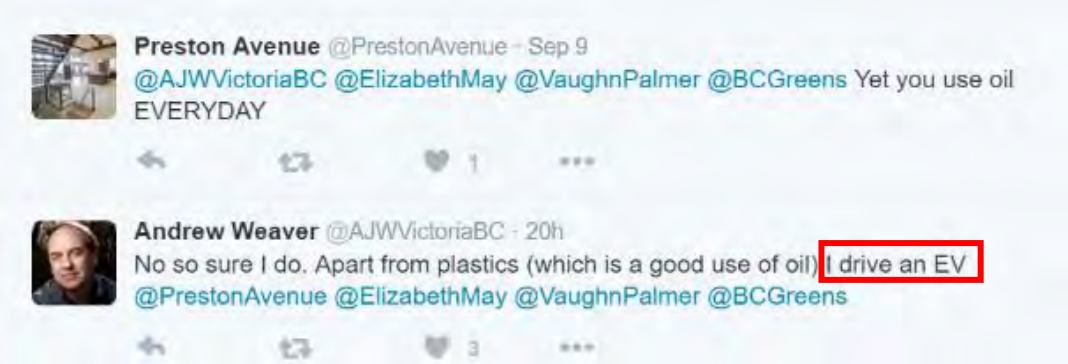
[16] "Carbon" has become the buzzword for carbon dioxide (CO_2), a trace element greenhouse gas which was thought to potentially cause global warming; it certainly contributes to a livable atmosphere on earth. Humans breathe out carbon dioxide at about 40,000 parts per million (ppm) with every breath. Carbon dioxide is naturally exuded from the earth during naturally induced warming periods. 'Carbon' per se is actually 'soot'.

[17] https://friendsofscience.org/assets/documents/climate_change_implications_Lyman.pdf

Renewables advocates blithely claim that wind and solar can replace fossil fuels by 2050 when the reality reported by the International Energy Agency is:

> *In 2014, the shares of primary energy supply by energy source were: oil, 31.3%; coal, 28.8%; natural gas, 21.0 %; biofuels and waste, 10.3%; nuclear, 4.8%; hydro, 2.4%; and "other", including all renewables energy sources, 1.4%. (Message: Fossil fuels now account for 81% of the world's energy supply and renewables just over one per cent. That situation will not change soon, easily or cheaply.)*[18]

Green activists often don't realize that everything, including wind turbines, solar panels and electric vehicles are all made with fossil fuels and all can only operate with 100% conventional power back-up (natural gas, coal, hydro, nuclear).



If Canada's efforts to meet climate change targets result in Canada having the economy of Chad, there will not be any benefit to pension funds. Witness the tragic collapse of Venezuelan society. Witness the looming catastrophe on the German power grid, the heart of industrial Europe. [19] To have healthy pension funds or returns on Sovereign Wealth Fund (SWF) investments, Canada needs a vibrant economy.

As illustrated by the International Energy Agency, hydrocarbons are in demand world-wide and are essential for the manufacture of everything in the modern world. By contrast, renewables and other clean-tech have shown themselves to be a "noble way to lose money" as stated by Joseph Dear, past CIO of CalPERS in a 2013 Wall Street Journal interview [20] [21] and feature some $25 billion in venture capital losses according to a recent MIT report. [22]

But, what of climate change and carbon risk?

This report offers some climate science insights so that pension fund trustees may more fully evaluate the conflicting claims regarding climate change, 'carbon' emissions, and #KeepItInTheGround or divestment campaigns.

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[18] https://friendsofsciencecalgary.wordpress.com/2016/11/14/facts-and-fallacies-on-world-fossil-fuel-use-vs-renewables/
[19] http://energypost.eu/end-energiewende/
[20] http://www.wsj.com/video/economics-clean-tech-funds-yielding-poor-returns/B80B7F56-55C8-467C-B45F-00DD08817FEF.html
[21] http://freebeacon.com/politics/nobly-losing-money/
[22] https://energy.mit.edu/wp-content/uploads/2016/07/MITEI-WP-2016-06.pdf

CONSENSUS ON CLIMATE CHANGE

On the claimed 97%: *"Science is not a democracy; science is about evidence. The evidence shows the sun has a great effect on climate that we can quantify. …The IPCC ignores it."*

Dr. Nir Shaviv, Astrophysicist, Hebrew University

"Climate change" is a ubiquitous term that most people take to only mean "human-caused" but as is evident from the Intergovernmental Panel on Climate Change (IPCC) definition found in the opening definitions, "**climate changes due to natural and human factors which are diverse, not well-understood, and which occur over very long time-scales."**

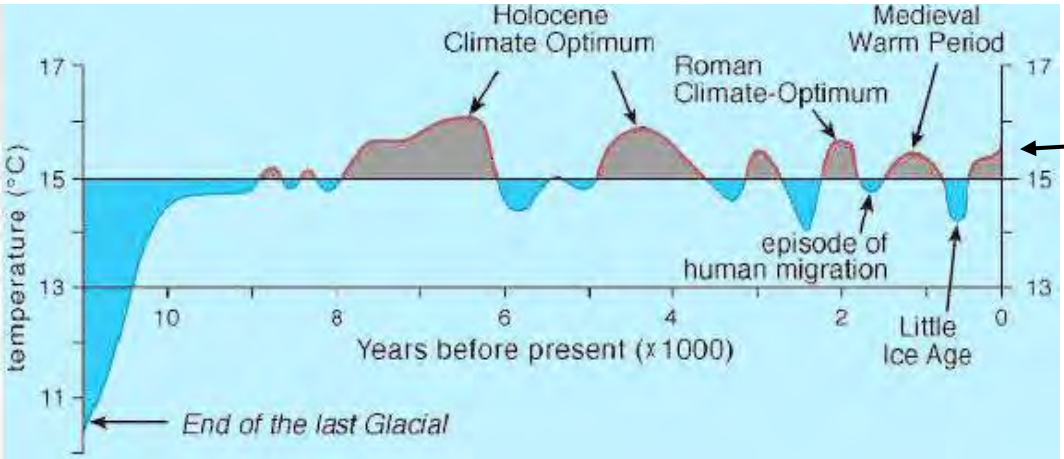
The mandate of the IPCC is to focus on **human causation** of climate change, but this has drawn criticism from the Dutch government:

*The IPCC needs to adjust its principles. We believe that **limiting the scope of the IPCC to human induced climate change is undesirable**, especially because **natural climate change is a crucial part of the total understanding** of the climate system, including human-induced climate change. The Netherlands is also of the opinion that the word 'comprehensive' may have to be deleted, because producing comprehensive assessments becomes virtually impossible with the ever-expanding body of knowledge and IPCC may be more relevant by producing more special reports on topics that are new and controversial.* [23]

Though many scientific bodies and governments have issued affirmative statements that they agree humans **affect** climate change, and that climate may be changing due to human industrial activity, emissions and land water use changes, there is **no "consensus" on the ratio of human vs. natural impact** and there are many dissenting scientists who disagree about the fundamental AGW claim that human industrial emissions of carbon dioxide (or other greenhouse gases – GHGs) is the sole or largest factor affecting climate change.

It is important to note that the proponents of (Catastrophic) Anthropogenic Global Warming (C/AGW) frequently refer to the past 150-year period where there has, in fact, been a rise in global temperatures of less than one degree Celsius, which, as shown below, appears to have some cyclical relationship to the earth moving out of the cooler phase of the "Little Ice Age." Thus, it is fair to say most scientists agree there has been warming – **however, this does not identify the cause or ratio of human versus natural influence.**

[23] http://projects.knmi.nl/ipcc/FUTURE/Submission_by_The_Netherlands_on_the_future_of_the_IPCC_laatste.pdf



Average near-surface temperatures of the northern hemispere during the past 11.000 years (after Dansgaard et al., 1969, and Schönwiese, 1995)

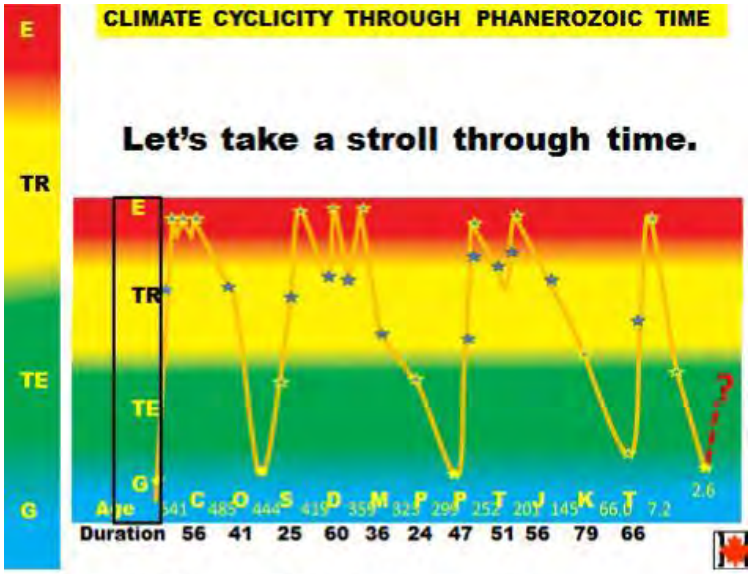
Earth scientists who have studied the 4-billion-year history of the planet generally hold the view that carbon dioxide concentration in the atmosphere is a ***consequence of climate change, only nominally a cause.*** The mainstream theory of Catastrophic Anthropogenic Global Warming (CAGW) holds that human emissions of carbon dioxide are the main cause of global warming, based on the theory that a doubling of carbon dioxide in the atmosphere will lead to a significant (or dangerous) rise in temperature that could otherwise be controlled by humans, by reducing those industrial human emissions. That's the theory.

While several studies claim that there is a 97% consensus among scientists on this premise, a thorough review of these studies reveals numerous flaws and they appear to be more of a convincing "social proof" than actual evidence. [24]

Further, as Dr. Nir Shaviv, astrophysicist and proponent of the solar/cosmic ray theory of climate change states: "Science is not a democracy. Science is about evidence." [25]

"Climatology" is a new branch of science that has developed over the past 30 years or so and is poorly defined in terms of who is a qualified practitioner. Some of the best-known climatologists focus their attentions on recent time frames of some 150 to 10,000 to 800,000 years and use computer models for their assessments.

[24] https://friendsofscience.org/assets/documents/97_Consensus_Myth.pdf
[25] https://youtu.be/3vCxxecs4hk



Excerpt of Dr. John D. Harper's presentation

This chart illustrates some 600 million years of natural climate change, from glaciation temperatures of minus 80°C to evaporization temperatures of >70°C when massive salt beds were formed. It is evident there have been natural, dramatic cyclical changes in climate, but these are not entirely predictable. Throughout these warming and cooling periods, there is no correlation of carbon dioxide concentration as a driver of rising temperature. [26] [27]

Contrast this history of natural climate change with the claim from the Mercer [28] *"Investing in a Time of Climate Change"* (2015) executive summary and you see a disparity and little likelihood that humans can stop climate change.

CLIMATE SCENARIOS (TO 2050)

Four scenarios chart potential outcomes in an uncertain future. They reflect the economic cost of emissions, physical damages, and policy developments:

1. Transformation (2°C).
2. Coordination (3°C).
3. Fragmentation – Lower Damages (4°C).
4. Fragmentation – Higher Damages (4°C).

Note: Climate is subject to unexpected changes by natural forces such as volcanoes, atmospheric oscillations, changes in ocean currents or geomagnetic influences. Few climate scientists would pretend to be able to predict future climate with the authority that the Mercer document suggests.

Source: Mercer "Long-Term Investors: Are you Aware of Your Climate Change Risk Exposure?"

[26] Series of short video interviews with Dr. Harper https://youtu.be/e6UHTa5hzq0?list=PLZcRTdbkGEnEqu-uF2vfDYHm8cNXdzC9q

[27] Full half hour presentation by Dr. Harper on the 600 million years of climate change https://youtu.be/O-mMpGBxPwI

[28] https://www.mercer.com/content/dam/mercer/attachments/global/investments/long-term-investors-are-you-aware-of-your-climate-change-risk-exposure-mercer-2015.pdf

Many dissenting scientists are earth scientists, who refer to the very long-term geological evidence in "the rocks," which is extremely well-documented, showing large natural variations in both temperature and carbon dioxide concentrations over the past 4 billion years, driven by numerous factors which include tectonic plate movements, changes in geomagnetism, oceanic currents, atmospheric oscillations (which have somewhat predictable, cyclical patterns), volcanic activity, and cosmic factors such as planetary conjunctions (affecting tides, geomagnetism, solar activity).

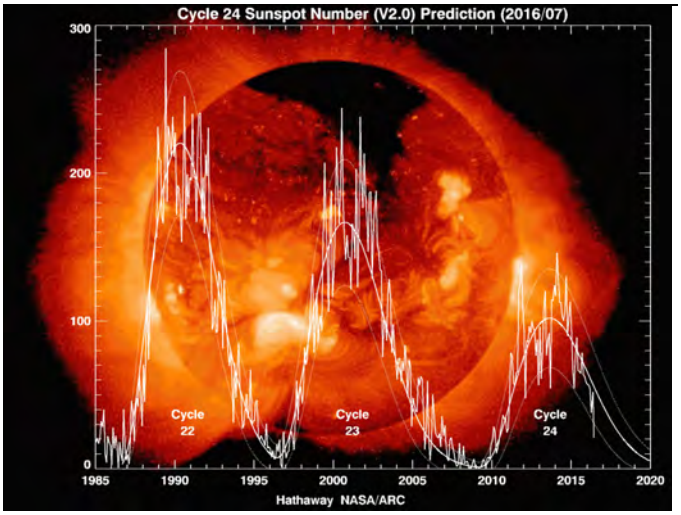
According to correspondence between Friends of Science Society and the IPCC, the 2°Celsius target for reducing human effect on global warming is a political and not a scientific target at all. [29] Yet Mercer claims this is a scientific target.

WHY LIMIT GLOBAL WARMING TO 2°C?

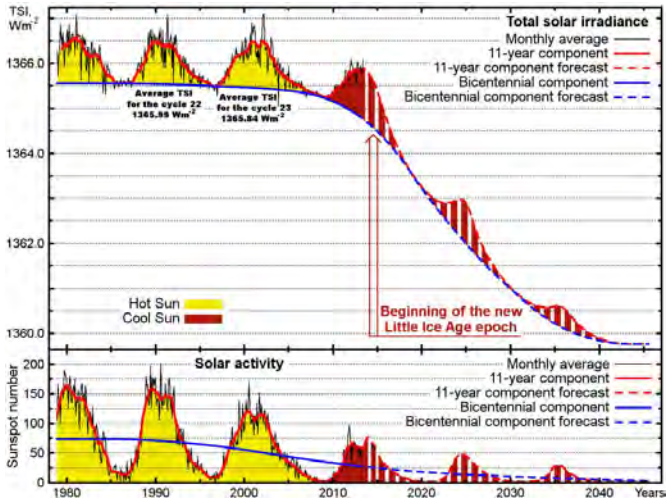
Just as investors set investment objectives, so too policymakers have set a goal to make sure our world gets no warmer by 2100 than 2°C over pre-Industrial levels. The 2°C limit has been identified by climate scientists as the maximum if we're to avoid dangerous interference with the climate system. The current estimate acknowledges that there has already been a 0.8°C increase, and assumes that a 1.5°C rise is already "baked in" to the system and cannot be avoided, regardless of action taken now.*

Source: Mercer "Long-Term Investors: Are you Aware of Your Climate Change Risk Exposure?"

Contrary to the statements in the Mercer report, many solar physicists and meteorologists foresee imminent cooling due to the current low solar activity cycle. In such an event, fossil fuels would be humankind's only protection from an extended period of brutal cold.



Hathaway NASA solar cycles show significant drop in solar activity in current Cycle 24.

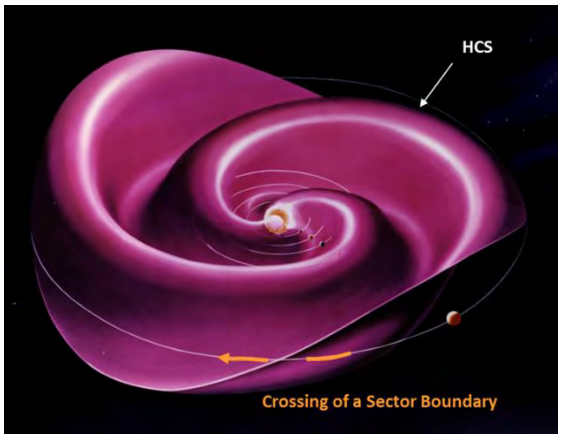


Russian solar physicist Khabibullov Abdussamatov says a long-term global cooling period has begun.

[29] https://friendsofsciencecalgary.wordpress.com/2015/11/05/a-matter-of-public-interest-on-the-ipcc-does-it-recommend-or-not-recommend-that-is-the-question/

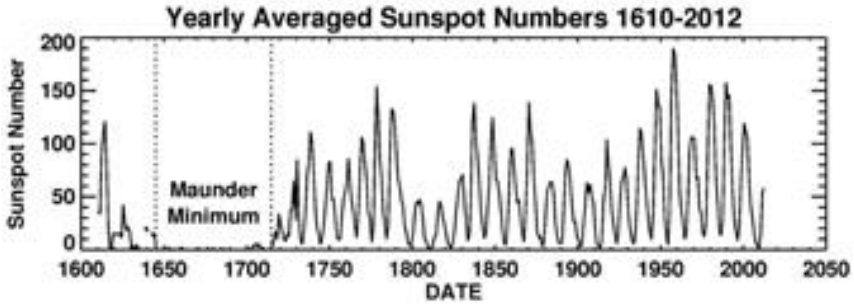
Presumably, pension fund trustee fiduciary responsibility would include <u>evaluating all risks</u>, including the risk of global cooling versus global warming. This would not be an example of 'climate change denial' but rather a fair evaluation of 'climate change reality.'

Astrophysicists and many physicists question the claims of human-caused global warming/climate change based on the physical properties of carbon dioxide and/or the long-term time scales of cosmic factors. Solar cycles affect numerous earth systems in different ways, creating an overlapping effect wherein it is difficult to discern which is driving what. Other cosmic factors have become well-known since the expansion of space exploration in the 1990's. One example is related to changes in the solar wind and the ebb and flow of cosmic rays reaching earth due to earth's orbit through the changing heliomagnetic "skirt" fields of the sun. The cosmic ray theory suggests that due to changes in the solar cycle and our movement through space, more or less cosmic rays enter the earth's atmosphere leading to changes in cloud creation, which in turn has significant warming or cooling effects.

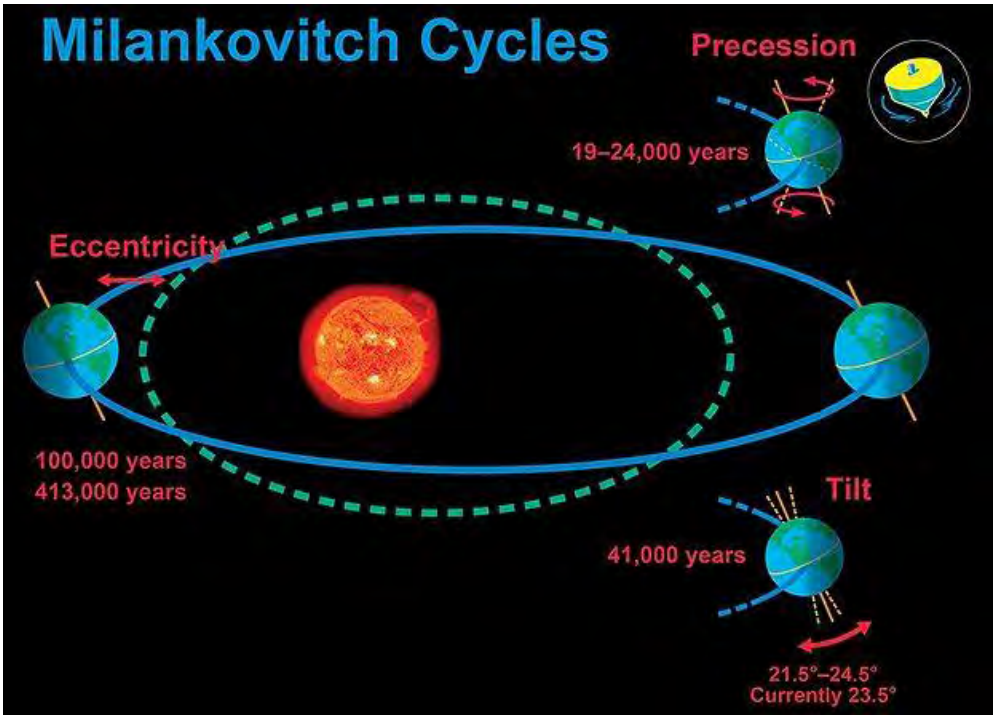


Artist's conception: Earth travels around the sun, passing through the changing waves of the heliomagnetic 'skirt' which changes the amount of cosmic rays entering our atmosphere, affecting cloud formation and climate.

Though outer space research is recent, there are some 400 years of human solar observations that correlate to warming and cooling cycles.



Long-term solar observations reveal a good match between solar activity and climate change periods.



Orbital variations affect earth's climate over long time scales.[30] [31] *Numerous periodicities of the sun's cycles have been identified. Additional research on solar effects on climate.* [32]

Professional Engineers are another group of scientists who represent dissenting views on human-caused climate change, proposed mitigations, costs and alleged benefits. Engineers work with precision data and have stringent legal and ethical obligations to their work, unlike academic climatologists who are free to postulate any possibility based on their theories. Engineers in Western society are charged with the safe, cost-effective, reliable design and implementation of most of the infrastructure and devices we rely on for our daily services. These range from public energy and sanitation systems, roads, transit, building, urban design and construction to auto and aerospace, computer and related electrical infrastructure design, from resource extraction to space exploration.

Consequently, data are reviewed very critically. Climate models that exhibit wild trends beyond observed temperatures or 'adjustments' to temperature data that are made quite subjectively are regarded as highly questionable by many professional engineers.

One such vocal critic is Tony Heller, a mission critical data specialist for major corporations and defense departments in the US who writes and tweets under the pseudonym of Steve S. Goddard. [33] Friends of

[30] http://www.universetoday.com/39012/milankovitch-cycle/
[31] http://earthobservatory.nasa.gov/Features/Milankovitch/
[32] http://chrono.qub.ac.uk/blaauw/cds.html
[33] https://youtu.be/Gh-DNNIUjKU

Science speaker Ron Davison, P. Eng. has prepared a presentation for the layman to help people understand discrepancies in climate change data. [34]

Returning to the SHARE document, the Mercer report summary[35] shows a figure ("Climate impact on returns by industry") that suggests renewables will be a 'winner' on returns while coal and natural gas will lose.

All 'renewables' like wind turbines and solar panels require coal, natural gas and oil for their manufacture, transportation, installation and maintenance. They require far more energy intensive operations for mining raw materials (especially solar), cement and rebar footings (wind turbines) and all require 100% conventional thermal back-up on the grid (typically coal or natural gas), it is not clear how Mercer comes to the conclusion that renewables could provide superior returns if the devices (wind turbines/solar panels) cost vastly much more to make due to carbon pricing, *or* would be impossible to make, install or operate on the grid without the use of fossil fuels. Is Mercer strictly relying on carbon tax levies and renewables subsidies from beleaguered, impoverished taxpayers for claims of higher returns for renewables? How could this be a 'prudent' assessment for any pension fund trustee?

[34] https://friendsofsciencecalgary.wordpress.com/2016/06/25/a-professional-engineer-examines-global-warming-data/
[35] https://www.mercer.com/content/dam/mercer/attachments/global/investments/long-term-investors-are-you-aware-of-your-climate-change-risk-exposure-mercer-2015.pdf

FACT CHECKING MARK CARNEY AND CLIMATE CATASTROPHE THINKING

Influential people from celebrities to Al Gore to Bank of England governor Mark Carney have made frightening claims regarding the future climate change risks. These claims frequently rest on 'evidence' of recent significant weather events which are said to demonstrate a 'rise in extreme weather' and thus human influence climate change.

Mark Carney, Governor of the Bank of England, made such a speech to insurers in London Sept. 29, 2015. [36]

Steve Kopits of Princeton Energy Advisors reviewed Mr. Carney's speech and found that the evidence did not support Mr. Carney's claims, [37] saying:

> *As an analyst, I find Mr. Carney's speech is truly dismaying. For the Governor of the Bank to claim that climate change is leading to rapidly rising insurance claims is, at best, a critical failure of analysis.*

Mr. Kopits is not the only one to question the rhetoric around weather events. Dr. Judith Curry, atmospheric scientist (recently retired) of Georgia Tech said people suffered from "weather amnesia" [38] in her testimony to the US Senate on Jan. 16, 2014, [39] as weather had been much worse in the 50's and 70's but no one remembered that. A year prior, Dr. Roger Pielke, Jr. also testified to the US Senate on climate change [40] and his findings paralleled those of Dr. Curry and Mr. Kopits – that there was no rise in extreme weather events in the US. Likewise, a 2013 study by Dr. Madhav Khandekar showed there was no global rise in extreme weather events, though he found a disturbing trend toward cold snaps in typically tropical places. [41] Many solar physicists and earth scientists see this as a harbinger of global cooling, especially as the sun has entered a periodic cycle of very low activity, colloquially referred to by some as 'solar hibernation.'

On the role of carbon dioxide: ***"…attempts to modify the climate through reducing CO2 emissions may turn out to be futile. The stagnation in greenhouse warming observed over the past 15+ years demonstrates that CO2 is not a control knob on climate variability on decadal time scales."***

Dr. Judith Curry, Georgia Tech

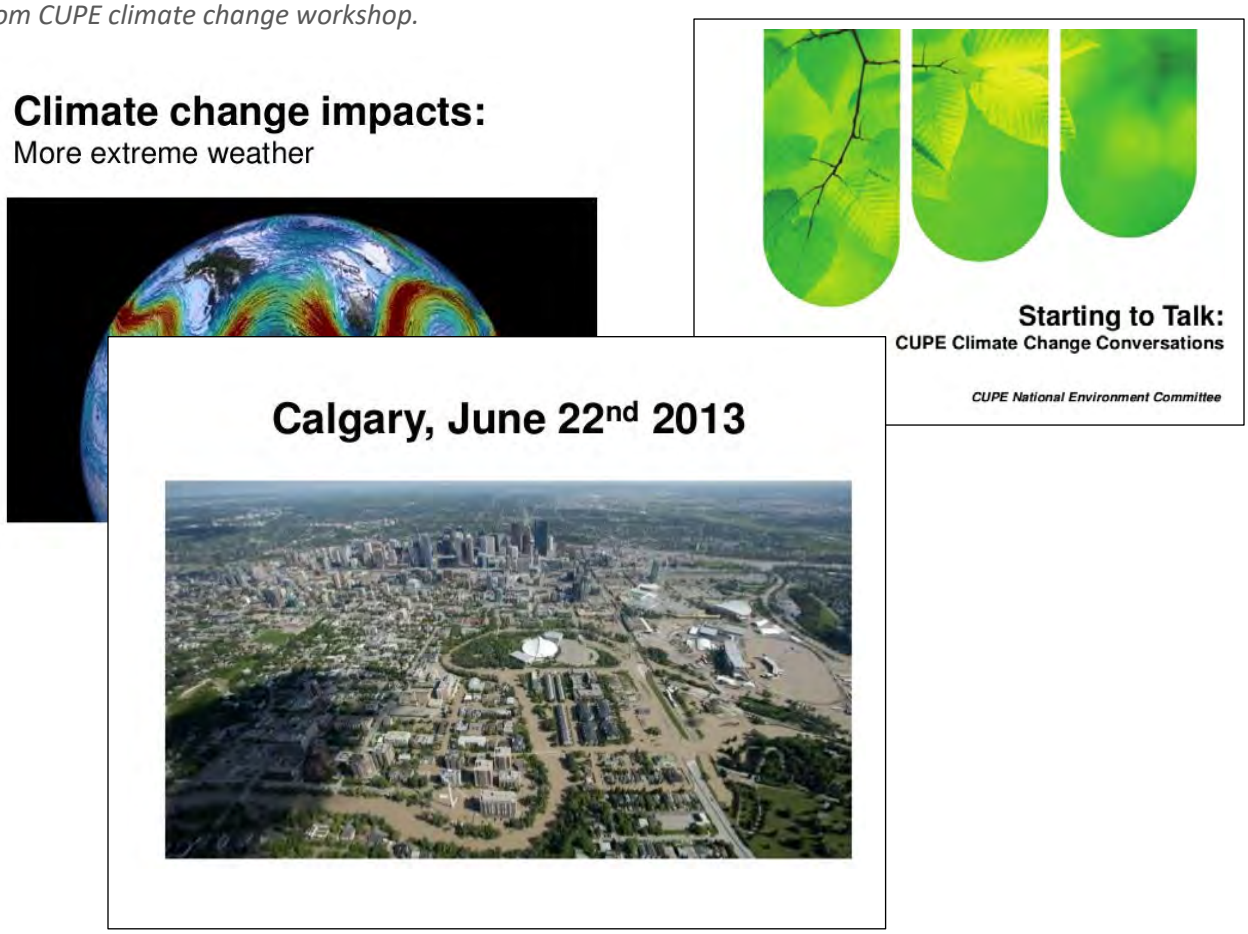
Judith Curry. (Photo by Peter Webster)

Many unions appear to be obsessed with 'green' energy policies and climate change. One example is CUPE – the Canadian Union of Public Employees, Canada's largest union with some 639,000 members.[42] CUPE has been very active in the world of climate change, attending Conference of the Parties meetings as a delegate and even signing on to the LEAP Manifesto [43] advocating for a "carbon-free" economy, an

[36] http://www.bankofengland.co.uk/publications/Pages/speeches/2015/844.aspx
[37] http://www.prienga.com/blog/2015/10/9/fact-checking-mark-carneys-climate-claims
[38] http://www.ucar.edu/communications/quarterly/summer05/reflective.html Source of Dr. Curry's photo
[39] https://curryja.files.wordpress.com/2014/01/curry-senatetestimony-2014-final.pdf
[40] http://sciencepolicy.colorado.edu/admin/publication_files/2013.20.pdf
[41] http://www.thegwpf.org/content/uploads/2013/11/Khandekar-Extreme-Weather.pdf
[42] http://cupe.ca/about-us
[43] http://www.marketwired.com/press-release/cupe-will-push-for-just-transition-and-green-jobs-at-cop21-in-paris-2077780.htm

impossibility. Vaclav Smil details how *"To Get Wind Power You Need Oil."* [44] Environmental activist Robert Kennedy explains that when building wind and solar farms, one is just building a natural gas plant. [45]

CUPE also sponsors a climate change workshop [46] the power point presentation for which also accentuates recent weather events as evidence of human-caused climate change/global warming. An example frequently referred to by Canadians is the Calgary 2013 flood. *Excerpt images of Calgary flood from CUPE climate change workshop.*



In fact, the Weather Network states that flooding is common in Calgary and it could happen again. The eight worst floods in Calgary's history occurred before 1933. [47]

[44] http://spectrum.ieee.org/energy/renewables/to-get-wind-power-you-need-oil
[45] http://energypost.eu/wind-solars-achilles-heel-methane-meltdown-porter-ranch-means-energy-transition/
[46] http://cupe.ca/climate-change-workshop
[47] https://www.theweathernetwork.com/news/articles/calgary-floods-it-could-happen-again/8295

On the influence of agenda driven environmental groups on IPCC reports: "…The fact that Richard Klein, now a Dutch geography professor, worked as a Greenpeace campaigner at age 23 was no impediment to the IPCC appointing him a lead author in 1994 – at the tender age 25. In 1997, ..the IPCC promoted him to coordinating lead author – its most senior rank…Bill Hare has been a Greenpeace spokesperson since 1992 …Hare had served as a lead author, …an expert reviewer for two out of three sections of the report, and that he was one of only 40 people on the "core writing team" for the overall, big-picture summary known as the Synthesis Report.

Donna Laframboise, Author

http://business.financialpost.com/fp-comment/book-excerpt-ipccs-activist-experts

	YEAR	PEAK FLOW	
1	1879	2265 m³/s	*(estimate)*
2	1897	2265 m³/s	*(estimate)*
3	**2013**	**1740 m³/s**	***(estimate)***
4	1902	1550 m³/s	*(estimate)*
5	1932	1520 m³/s	
6	1929	1320 m³/s	
7	1915	1130 m³/s	
8	1923	841 m³/s	
9	1916	810 m³/s	
10	2005	791 m³/s	

Table from the Weather Network article on previous Calgary floods.

These examples illustrate that claims in the KM Report that extreme weather events have increased or that this is evidence of human-causation (neither view supported by IPCC scientific reports) are not supported by the evidence.

Likewise, it causes one to questions the KM Report statement by Peter Chapman, Executive Director of SHARE that trustees must act "*in their sole interest"* [of beneficiaries], it is clear trustees should prudently review all evidence and that the broader society must be able to operate viably and vibrantly. Otherwise, as illustrated by Robert Lyman's assessment of the 2°C target for greenhouse gas reductions, the Canadian economy would be destroyed.

WHAT OF GLOBAL WARMING OR CLIMATE CHANGE?

From 1850 to 1998 there was a less than 1° Celsius rise in global average temperatures. Since 1998, as reported in the IPCC's 2013 AR5 Working Group I Physical Sciences report, there was a hiatus in global warming with *'values very close to zero.'* It should be noted that there is no established 'optimal' temperature for earth or life on earth nor is there any established optimal level of carbon dioxide.

Carbon dioxide is a trace gas in the atmosphere of earth and ~95% of the carbon dioxide on earth emanates from natural sources such as outgassing as oceans warm (their warming due to various factors including solar activity/cycles, changes in deep ocean currents, decrease or increase in polar ice melt, thermal activity from rifts where lava may rise to the surface, etc.). Decaying matter contributes to carbon dioxide and every spring new growth in trees, particularly in the northern hemisphere, uptakes that carbon dioxide. Human contribution to this vast cycle of carbon dioxide release and uptake is nominal as explained by Dr. Ian Clark. [48]

Further, the evidence shows that, as reported by the IPCC in 2013, there has been a significant pause in global warming; many scientists foresee global cooling may be imminent. Some claim cooling will be nominal due to the warming effect of some human industrial emissions, others say the cooling period may be several decades, some have more foreboding predictions.

While there are many reports of 2016 having been the 'hottest year ever on record,' this was due to a natural atmospheric oscillation called El Nino. In fact, the alleged warming is so small that within the margin of error, we could have experienced warming OR cooling the variation in temperature can be of +0.12°C (global warming) or -0.08°C (cooling)! These tiny changes - warm or cool - are rarely pointed out to the public. [49]

That 'record' typically referred to is the 40 years' satellite instrument record, a very short time in terms of climate change.

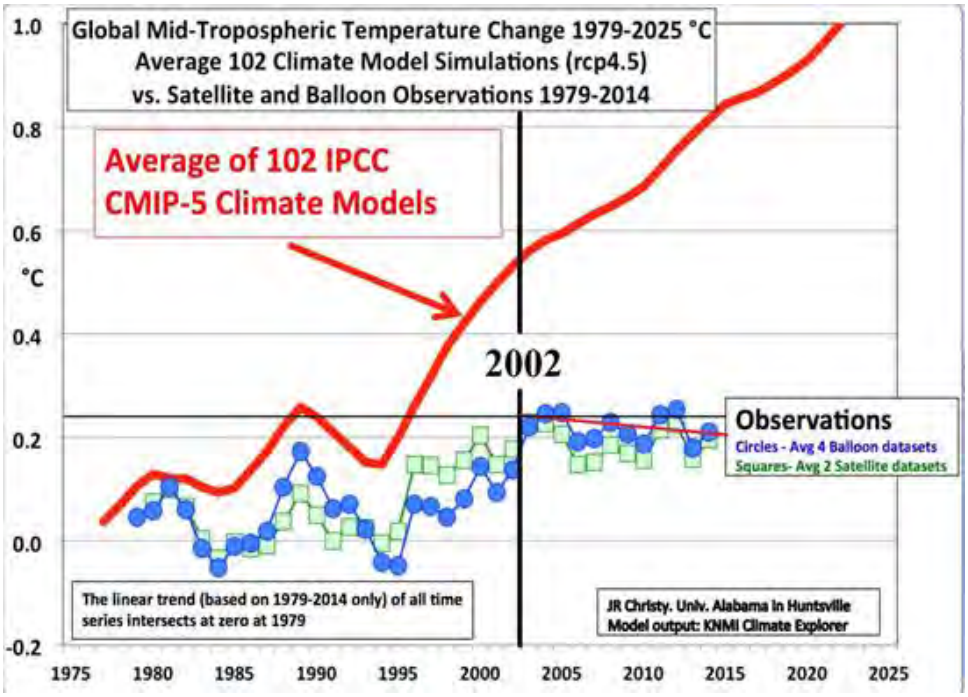
Sources such as earlier newspaper records and geological evidence show that temperatures were much higher in the 1930s in North America and other spots around the globe. Temperatures are presently dropping dramatically and Dr. Roy Spencer reports that due to this, 2016 is not statistically warmer than the previous 1998 El Nino year according to satellite records.

The precipitous drop in global temperature from the peak of the 2015/2016 El Niño event has now returned to the stasis in global temperature since 1997 (called "the pause." The 'climate catastrophe' has come from computer generated 'models' (simulations) – not from empirical evidence.

On carbon dioxide and global inequity on climate change:
"Carbon dioxide has become a 'Satanic gas'…but something like a billion people do not have access to basic sanitation or running water in the developing world. Coal is affordable power; clean coal technologies reduce emissions. If we go into a cooling cycle of decades, as I think we may, we will need it."

Dr. Madhav Khandekar
Former Research Scientist with Environment Canada

[48] https://youtu.be/gb08wPe4zEc
[49] https://thefederalist.com/2017/01/27/new-york-times-our-readers-are-too-dumb-to-understand-numbers/



*The above graph illustrates a red rising line that is a composite of 102 computer simulations of the IPCC that predicted significant warming. The blue and green dots and squares illustrate the **observed** data of satellites and weather balloons, showing that in reality there has been a long 'pause' and predictions were extremely exaggerated. Public policy on climate change has relied on IPCC computer modelled simulations, not the observed temperature data.*

Further, the 'pause' was not predicted by any of the climate models. As Dr. Ross McKitrick points out, "…it's not the pause, it's the flaws…" that indicates problems in the climate models.

Many scientists either believe the carbon dioxide theory of AGW to be fundamentally flawed (Dr. Edward Berry, Dr. Murry Salby, Prof. Dr. Istvan Marko, Prof. Emeritus Dr. Dick Thoenes, to name a few) or that the 'climate sensitivity' or the presumed effect of more carbon dioxide on climate) has been set too high by the IPCC and various scientists in the field.

Dr. Judith Curry has prepared a detailed review of climate models and the relative uncertainties for lawyers and the document is worth reading to understand that the field is filled with large uncertainties, despite claims of 'consensus' and certain catastrophe. [50]

Following Dr. Ross McKitrick's 2014 presentation to Friends of Science Society,[51] a series of short videos on climate models and the alleged Social Costs of Carbon, [52] as well as a short layman's guide to SCC were prepared for the public by Friends of Science Society. [53]

[50] https://judithcurry.com/2016/11/12/climate-models-for-lawyers/
[51] https://www.friendsofscience.org/index.php?id=750
[52] https://youtu.be/g30JfQIK6GA
[53] https://www.friendsofscience.org/assets/documents/McKitrick_Climate_Change_SCC_Feb_14_2015.pdf

Fundamentally, the point is that governments, investors, policymakers are all betting on modelled/simulated climate information, when observed temperatures do not support the modelled forecasts. The divergence between models and observed reality is significant.

WHY IS THERE A TARGET IF THERE IS NO CRISIS?

"Big Climate" is a driving force in the world, powered in part by the UN Principles for Responsible Investment and by groups like the Rockefeller non-profit Carbon Disclosure Project (CDP) and large ENGOs like World Resources Institute (WRI), (which claims to have help set ¾ of the world's Intended Nationally Determined Contribution targets (INDCs) for the COP-21 Paris agreement). WRI is also listed on Al Gore's Generation Management Investment site as a consultant as are several other very large, influential environmental groups. This appears to suggest potential conflicts of interest.

Pension funds/institutional investors have become *the* global source of capital world-wide and primary owners of corporations, as foretold in the 1970's book by management expert Peter Drucker in *"The Pension Fund Revolution."* The power and influence of pension funds was limited in Canada by a 30% investment rule (that they could not own more than 30% voting equity in corporations; recently revised in Ontario) but Sovereign Wealth Funds (SWF) have not been subject to such rules in Canada. Some pension funds can invest via mutual funds to extend their corporate reach without breaching that investment cap.[54] Vijay Jog and Jack Mintz state that:

> *"...in Canada today, some acquirers enjoy tax advantages over others. And that could mean that certain buyers, who may not be best suited to owning a particular company, are able to outbid those who are better positioned to run that company at optimal efficiency. That is a problem not just for investors who end up outbid, due to Canada's uneven tax policy, but for the Canadian economy, which suffers from the resulting economic inefficiency."*

Since the establishment of the United Nations Principles for Responsible Investment in 2006, and the Rockefeller Financial Advisors non-profit Carbon Disclosure Project - CDP (a voluntary reporting of corporate and city GHG footprints and local climate change events established some 15 years ago [55] funded by governments, foundations and corporations [56]), market investing has been skewed toward certain avenues focussed on environmental, social, and corporate governance (ESG) as the UNPRI Principle six requires that signatory investors focus on 'sustainability' and 'comply or explain.' [57]

The CDP reported in 2016 on its website that CDP investor initiatives were backed by some 827 signatory institutional investors with $100 trillion USD assets under management. There is thus, a triumvirate of financial, electoral and ideological power in the world driven by pension funds/Sovereign

[54] https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2240449
[55] https://www.cdp.net/en/info/about-us
[56] https://www.cdp.net/en/info/finance
[57] https://www.unpri.org/about/the-six-principles "Report on progress and/or achievements relating to the Principles using a comply-or-explain approach."

Wealth Funds, unions, and foundations – all of which are tax-free and which now influence corporations and society via investments, banks, energy policies, academia.

As well the unions and their vast numbers of constituents whose pensions funds are invested in the funds and are thus an influential voting block in elections, are driving policy decisions that unequally affect tax-paying non-unionized citizens. These tax-free funds and unions are unelected and unaccountable to any of the non-beneficiary citizens whose lives they affect.

Thus, it is interesting that the KM Report appears to address two key items in one overt and one subtle manner. The overt aspect is that of the command to pension fund trustees that *"climate change denial is not an option"* while the subtle issue seems to be a form of legal opinion or implied permission for institutional investors to formally interact with governments to (apparently) influence public policy to protect the interests of their beneficiaries. Curiously the KM Report refers to case law referencing *"Trustees may even have to act dishonourably (though not illegally) if the interests of their beneficiaries require it"* and *"the duty of trustees to their beneficiaries may include a duty to 'gazump' "* [58] while telling pension trustee readers that they must conform to climate change dogma.

The KM Report may have been influential regarding public policy advocacy, in that, days after it was issued, some 120 institutional investors and foundations (some of which are funders of West Coast Environmental Law/Foundation [59]) sent a collaborative letter to the Premier of Alberta presenting their climate change agenda. [60] NEI Investments, [61] lead author of the letter, subsequently issued a document on transitioning to a low-carbon economy stating that its collaborative group had been very influential on the Alberta government, as most of their proposed policies on carbon tax, renewables and coal phase-out had been adopted.[62] By December 14, 2016, the sub-sovereign, democratically-elected Alberta government was reporting on its climate change policy to the unelected, unaccountable UNPRI. [63]

The carbon tax is wildly unpopular with the electorate in Alberta (and not sitting well nationally either). Alberta taxpayers will bear a huge burden of billions of dollars in debt for coal phase-out, when ironically Alberta sits on one of the richest, largest, most accessible, and best quality coal reserves in the world.

Is it honorable, ethical, or good business practise to impose huge financial burdens on the electorate that will bear no benefit in terms of the environment, climate change or the economy?

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[58] https://en.oxforddictionaries.com/definition/gazump 1. Make a higher offer for a house than (someone whose offer has already been accepted by the seller) and thus succeed in acquiring the property: 2. **Swindle** (someone): *'I gazumped a friend of mine with complete success last night'*

[59] http://wcel.org/our-supporters-1516

[60] https://www.neiinvestments.com/documents/PublicPolicyAndStandards/2015/Premier%20of%20Alberta%20Collaborative%20Investor%20Letter.pdf

[61] NEI Investments (NEI) is a mutual fund company that is committed to making excellent, independent portfolio managers accessible to Canadian retail investors through three competitive fund families: NEI Funds, *Northwest Funds* and *Ethical Funds*. … NEI is a fully Canadian company, owned 50% by Desjardins Group and 50% by the Provincial Credit Union Centrals.

[62] https://www.neiinvestments.com/documents/Marketing/Transitioning%20to%20a%20Low-carbon%20Energy%20System.pdf

[63] https://www.unpri.org/events/alberta-s-climate-change-policy-plan-progress-update-and-investor-feedback-2016-12-14-127/register

UNELECTED, UNACCOUNTABLE TAX-FREE ENTITIES CREATE BURDENS FOR CITIZENS & CORPORATIONS

> *On the other hand, it could be argued that the tax exemption provides an unfair advantage to SWFs and pension funds in acquiring and managing companies. The point being that it is not wrong for these investors to control companies, but they should not receive a tax advantage to do so.* ***In a tax-free world, companies would be purchased and controlled in principle by the most able investors who can operate their business at a higher rate of return****. However, if some acquirers have a tax advantage, economic efficiency can be impaired if some owners acquire a business because of the tax exemption, rather than due to their better management abilities.*

As Jog and Mintz[64] point out, Sovereign Wealth Funds (SWF) and pension funds have tax-free advantages that other investors do not have. The unions invested in these pension funds have large constituencies that can be easily motivated through internal newsletters, workshops and trendy themes like the LEAP Manifesto, to support ideologies that will materially affect national and regional economies and related energy policies in ways that are detrimental to tax-paying citizens and corporations – and these tax-free groups will never be accountable for the outcomes.

PEONAGE – INVOLUNTARY DEBT SERVITUDE

> *"Something is wrong now Mr. Trudeau. My heat and hydro now cost me more than my mortgage," said Kathy Katula, of Buckhorn, Ont., to a round of applause. "I now not only work 75 hours a week, I stay and work 15 hours a day just so I don't lose my home."*
>
> - *Global News Jan 13, 2017* [65]

On January 13, 2017, Prime Minister Trudeau was confronted by Kathy Katula during his 'meet-the-people' stop. He brushed off her sobs with platitudes, gave her a hug and went on with his tour.

In Peter Drucker's book *"The Pension Fund Revolution"* he introduced the term 'peonage' to apply to workers who were restricted in their job/career choices by the parameters of pension payouts, arguing that "involuntary servitude" was being imposed upon government employees, because people could be cut from their deferred pension benefits if they were fired, or left before a specific employment term, even if by a single day.

[64] https://www.policyschool.ca/wp-content/uploads/2016/03/jogmintz-pensionwealth.pdf
[65] http://globalnews.ca/news/3179769/justin-trudeau-confronted-by-sobbing-ontario-woman-over-cost-of-hydro-bill/

But clearly today's 'peonage' is being endured by the ordinary taxpayer who is carrying the burden of tax-free pension fund investments in 'noble' ventures. Commenting on Joseph Dear's astounding revelation on behalf of CalPERS in his 2013 interview with the Wall Street Journal, that clean-tech was a 'noble way to lose money' and the way to regain losses was to 'raise the price of carbon,' Jason Richwine of the US-based Heritage Foundation said: *"Administrators can risk money on 'noble' investments, all the while knowing that their losses are covered by taxpayers."* [66] Another commentator: *"Investment strategies that pursue 'social goals' at the expense of investor (or pensioner and taxpayer) interests are reprehensible,"* said Jagadeesh Gokhale, a senior fellow at the Cato Institute.

On carbon dioxide - a consequence of climate change: "The one thing we cannot change, based on earth's history, is climate change. …It's really important that people understand, carbon dioxide concentration is a consequence of climate change, not the cause….We live on an active planet. You will not see climate change in your lifetime."

Dr. John D. Harper, FGSA, FGAC, PGeol., former director of the Geological Survey of Canada

Signatories to the UNPRI appear to be obsessed with a focus on 'ethical' investments in the noble cause of climate change, which as illustrated above, tragically run roughshod over ordinary citizens and distort corporate values, operations and earnings in the most unethical and undemocratic ways, based on climate change premises which are false and misleading, as we have shown.

CAN YOU STOP CLIMATE CHANGE?

As for the proposition that human beings can prevent global warming or climate change if emissions are reduced? Few earth scientists would agree – having studied 4 billion years of climate change written in the rocks. Despite the claims of 97% consensus, those scientists questioned agree humans **affect** climate, but very few support the notion that humans are a singular cause or that human industrial carbon dioxide/Greenhouse gas emissions are a singular cause. There is much vigorous debate in scientific circles about the ratio of natural versus human influence, and other human factors like land use, water diversion and deforestation. While Friends of Science Society challenges conventional views on climate change and its drivers, it is imperative that human beings use technology, common sense and responsible environmental practices to reduce **noxious** emissions, to improve air and water quality. Canada has done that, [67] while other nations have fallen behind or failed.

Thanks to cooperation between industry and government, in Canada from 1985 to 2011:

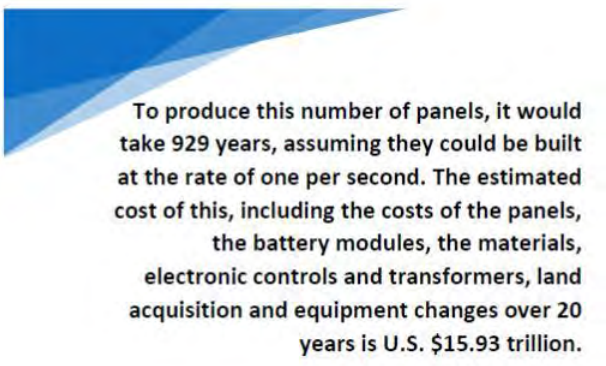
Industrial carbon monoxide emissions: DOWN 26%
Industrial carbon particulate emissions: DOWN 44%
Industrial sulphur dioxide emissions: DOWN 69%
Total economic output: UP by 89%

[66] http://freebeacon.com/politics/nobly-losing-money/
[67] http://www.yourenvironment.ca/

By contrast, the EU enacted incentives to reduce carbon dioxide and use more fuel-efficient, lower carbon dioxide emissions diesel engines, resulting in some 80% of vehicles on the road in France being on diesel. While gasoline is higher in carbon dioxide emissions, it is much lower in smog-causing noxious emissions. Tragically, the diesel incentive plan has resulted in a dramatic increase in Nitrogen Oxides (NOx) and soot (Particulate Matter smaller than 2.5 microns – PM2.5), leaving Paris as one of the most air polluted cities in the world.

Returning to the central premise of the KM Report that argued that pension trustees have an obligation to act prudently on behalf of beneficiaries and to take climate change risks into account, part of that prudence is clearly that of being aware of the uncertainties in the climate change assessments, the politicization of the field, and the reality that ***at the present time there is no alternative, market-ready power source for modern society other than hydrocarbons*** – oil, natural gas, coal and wood – even nuclear and hydro rely on fossil fuels for facility construction; wind and solar more so and they have very poor energy return on energy invested while wastefully consuming fossil fuels and rare materials. [68] Cambridge professor Michael J. Kelly shows that wind and solar cannot support even the basic needs of society.

Though many predictions are made almost daily in the press that wind and solar will overtake fossil fuels, this is very unlikely in the near term. [69]



IN CONCLUSION

It is our understanding that those engaged in securities must participate in continuous disclosure. Consequently, it is concerning that institutional investors with over $100 trillion in assets under management are apparently tied to a climate change ideology based on climate science information from 2002. We expressed our concerns on this matter in our Open Letter to NEI Investments. [70] We hope this document has provided you with some insights into climate science and the economic consequences of bad climate policy and investment based on ideological views over the evidence.

[68] https://www.cambridge.org/core/journals/mrs-energy-and-sustainability/article/lessons-from-technology-development-for-energy-and-sustainability/2D40F35844FEFEC37FDC62499DDBD4DC/core-reader
[69] https://friendsofsciencecalgary.wordpress.com/2016/05/31/why-renewable-energy-cannot-replace-fossil-fuels-by-2050/
[70] https://friendsofsciencecalgary.wordpress.com/2016/08/08/an-open-letter-to-clients-and-investors-of-nei-investments/

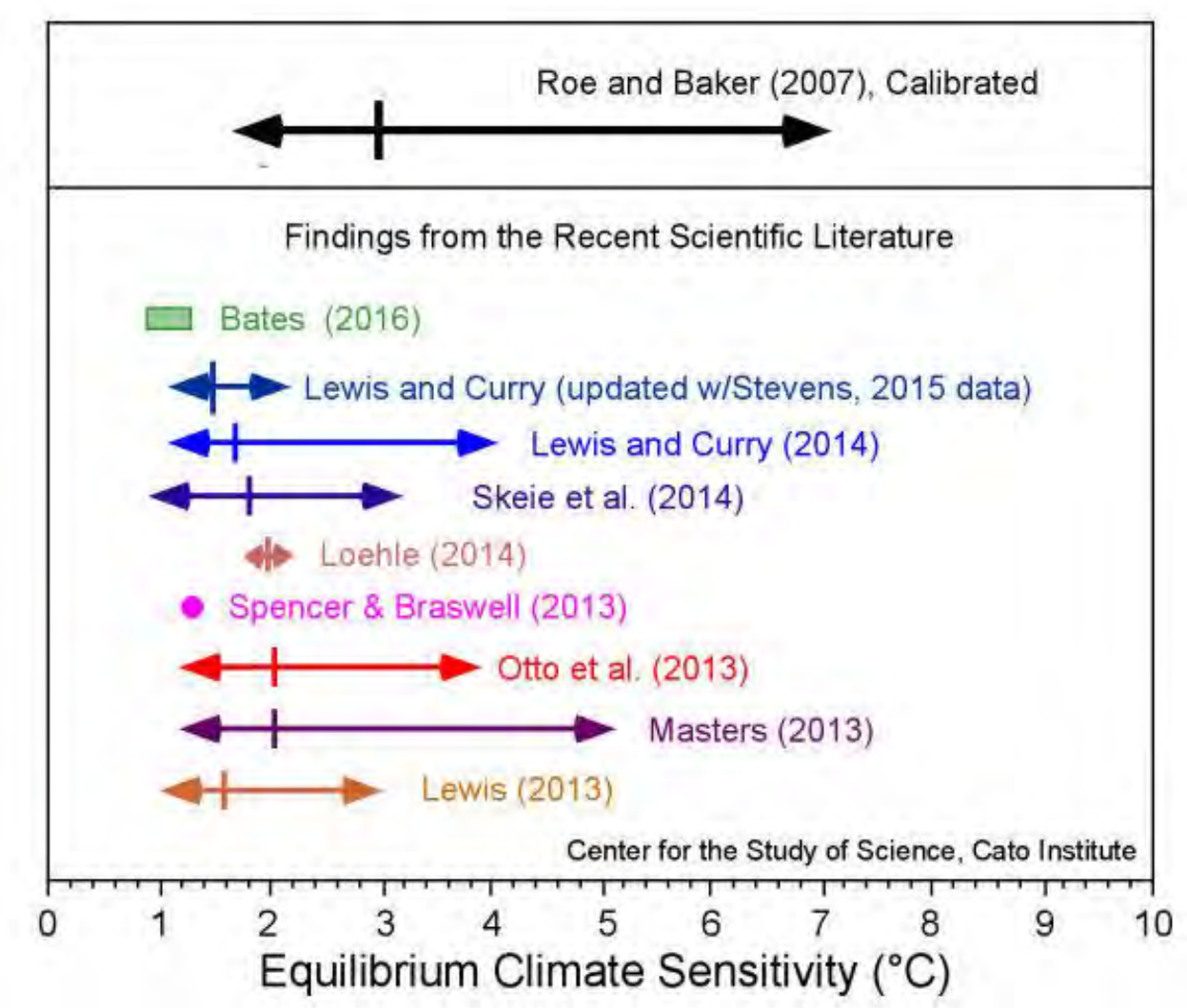
APPENDIX

A SAMPLE OF DISPUTED AREAS IN CLIMATE SCIENCE

We offer a brief overview of some evidence and models that dispute claims in the KM Report. Carbon tax rates are established based on the modeled estimates of future damages or the "Social Costs of Carbon" -SCC. Warming can also have a net **beneficial** outcome, something rarely discussed.

Page 6 of the KM Report says "The dramatic increase in global greenhouse gas (GHG) emissions is not in any scientific dispute, nor is the general impact of such emissions on the Earth's climate."

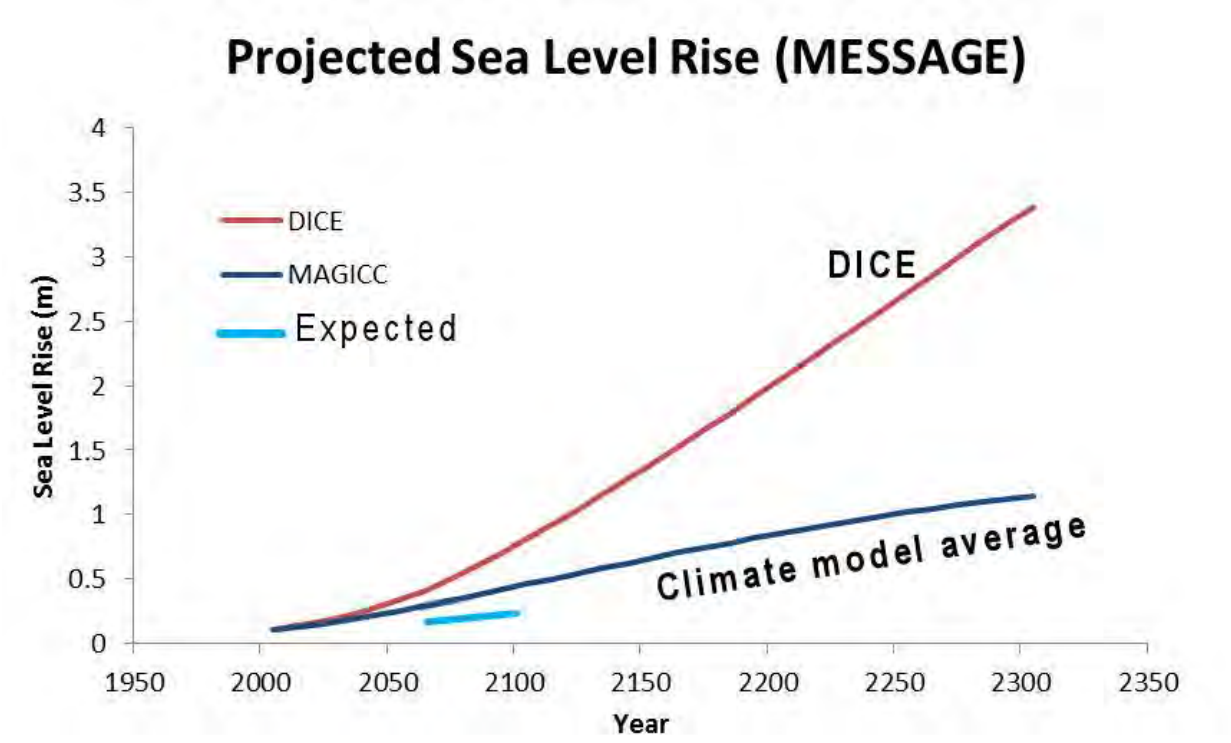
The second part of the sentence is wrong. Here is a chart of recent equilibrium climate sensitivity (ECS) estimates. Note that "equilibrium" takes two to three thousand years according to models. The transient climate response (TCR) is the response at the time of CO2 doubling, which at current exponential growth would take about 126 years. The TCR is about 85% of the ECS.



Correcting the "Lewis and Curry w/Stevens" by the urban warming and millennium warming cycle, gives exactly the same value as the Bates 2016 study of 1.0 ºC ECS, or 0.85 ºC TCR, or 0.57 ºC change from 2016 to 2100 (84 years). This is vastly different from the Roe and Baker estimate range used by the US IWG on the social cost (benefit) of carbon (dioxide).

The reason the IPCC estimates are too high is that they are based on climate models (simulations) [71] that are tuned to the 1970 to 2002 temperature rise (which was steep and where carbon dioxide rise and warming closely matched – since 1998 that has not been the case), and the models falsely assume the rise is all due to greenhouse gas emissions. The IPCC focus on human causation.

The Dynamic-Integrated-Carbon-Economy (DICE) integrated assessment model vastly overestimates the projected sea level rise as shown below.

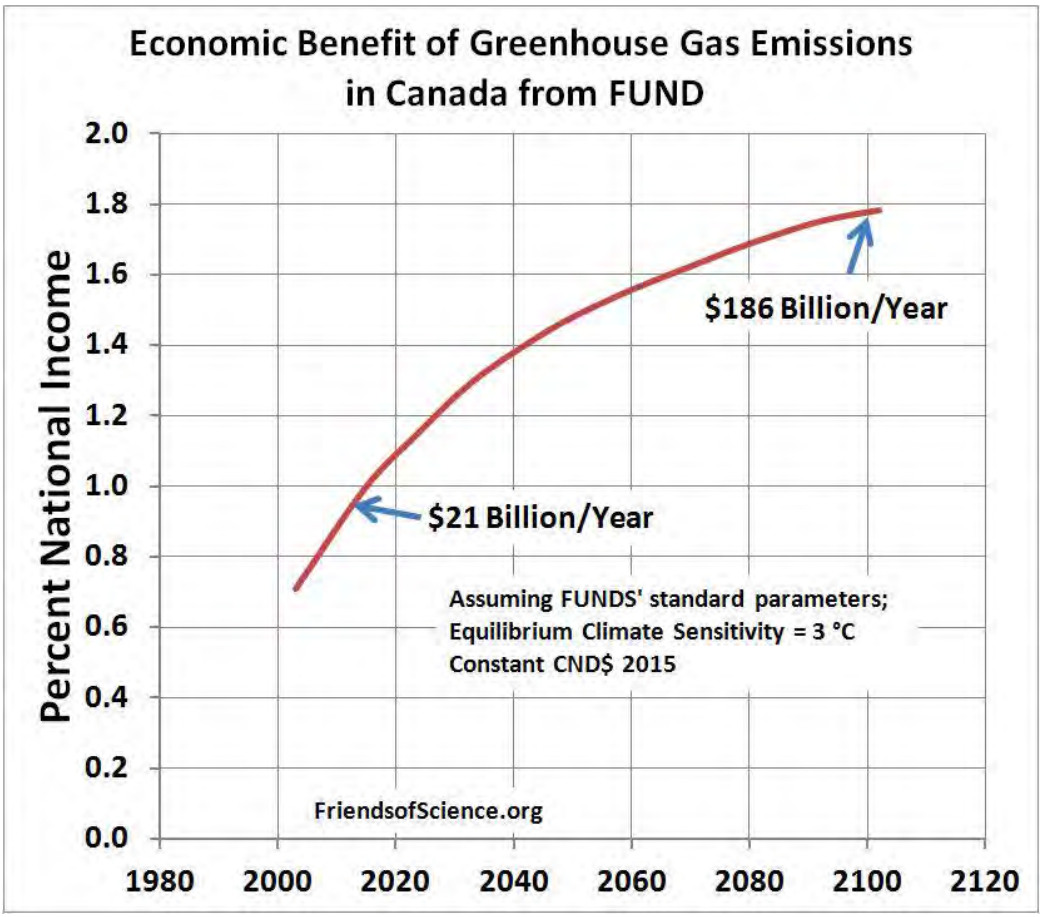


Note: added the "Expected curve from running MAGICC with a 1 ºC ECS to this graph from a paper by Dr. Pat Michaels.

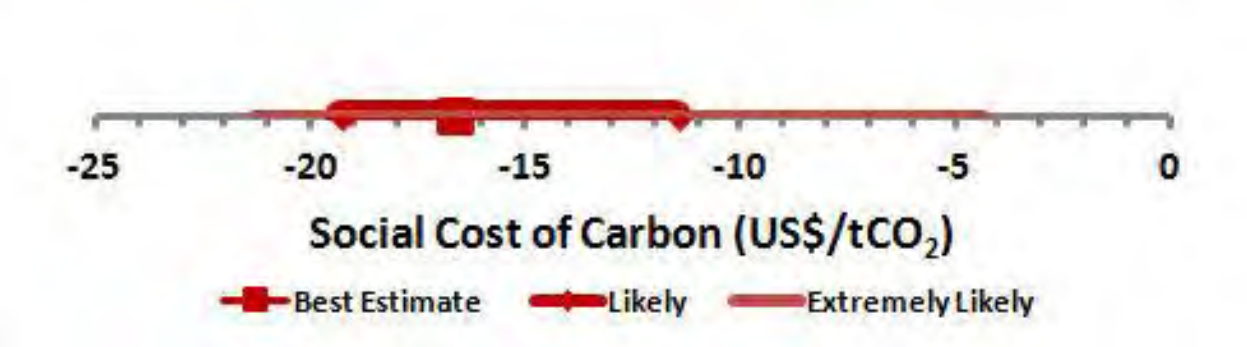
The DICE and Policy Analysis of the Greenhouse Effect (PAGE) [72] models used to calculate SCC do not include the benefits of warming nor the benefits of CO2 fertilization. They do not include the beneficial effects of adaptation, which greatly increases the estimates SCC.

[71] https://object.cato.org/sites/cato.org/files/serials/files/regulation/2016/4/regulation-v39n1-4.pdf
[72] http://climatecolab.org/wiki/-/wiki/page/PAGE

The Climate Framework for Uncertainty, Negotiation and Distribution (FUND) [73] model estimates that greenhouse gas emissions will cause substantial benefits to Canada which increase throughout the 21st century as shown here:



On a global basis, assuming evidence based estimate of climate sensitivity (TRC = 0.85 ºC), FUND calculates a best estimate of about US$17/tCO2 net ***benefit:***



[73] http://www.fund-model.org/

About

Since 2002, Friends of Science Society has reviewed a broad spectrum of literature on climate change and have concluded the sun is the main driver of climate change, not carbon dioxide (CO2). Friends of Science is made up of a growing group of earth, atmospheric and solar scientists, engineers, and citizens.

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