

Climate Policy & Implications for Electricity Prices

In the US a public debate occurred recently between two experts on climate change and what to do about it, Dr Willie Soon of The Harvard-Smithsonian Centre and Dr Jon Christensen, an adjunct assistant professor at the Institute of the Environment and Sustainability. I list below some of the points made and also a graph comparing the increase in electricity prices for California and for the rest of the US between 2001 and 2017.

According to this graph, the increase in California was five times greater than the increase in the rest of the US. California is the greatest user of renewables and might be compared in that regard to South Australia.

More detail is provided below

Des Moore

Points Arising From Soon/Christensen Debate:

>Soon: CO2 demonization is not true; Ch: There is an existential threat, with adverse effects on all in their lifetime.

>Soon: Ocean acidification is one of the most dangerous myths and is one of the most extreme things that could come up; Ch: it is science, there's a wide spectrum of results.

>Soon: Fossil fuels offer the most energy intensity...Wind and solar could never do anything; Ch: you may get a plane off the ground with bio-gas.

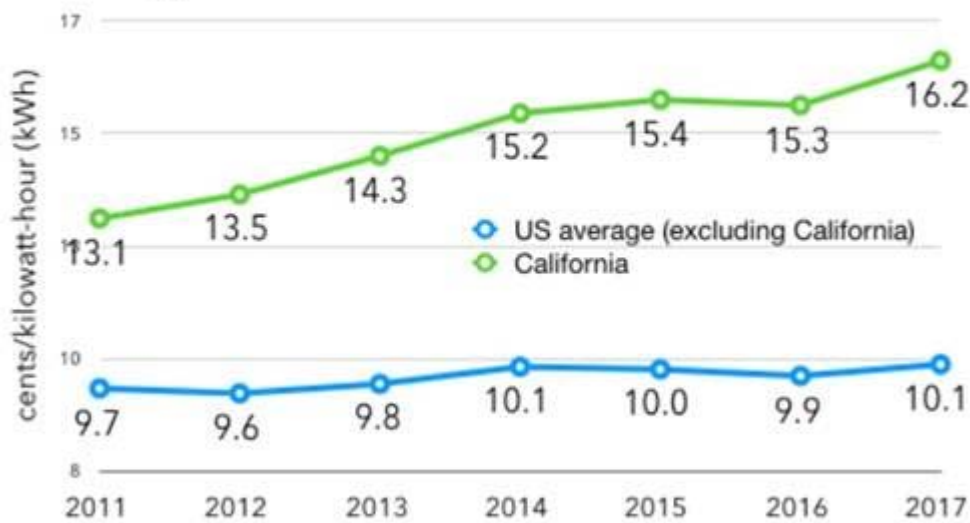
>Ch: the majority of people believe climate change is real, its caused by people, it will harm people in the future, and we should do something about it; Bryan Dey: Its poor people that are going to suffer the most.

>Soon: Science does not work by consensus. Only 0.3% of a sample of papers endorsed the consensus view.

>Soon:CO2 increase is greening the planet.

>Ch: The goal is to increase the cost of carbon; Economists agree that the higher electricity prices in California reflect the high penetration of intermittent renewable

Electricity prices in California rose 5x more than in rest of U.S.



Source: US Energy Information Administration, 2017.

NoTricksZone

***"Not here to worship what is known, but to question it" -
Jacob Bronowski. Climate and energy news from Germany in
English - by Pierre L. Gosselin***

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[In A Rare Public Debate, Dr. Willie Soon Uses Real Science To Take On The Climate 'Apocalypse'](#)

By [Kenneth Richard](#) on 8. March 2018

Comedy clubs aren't usually thought of as venues for serious debate about controversial topics like climate change. And yet in a rare debate opportunity, Harvard-Smithsonian Center astrophysicist **Dr. Willie Soon** took full advantage of the short time he had available to him. He critiqued "consensus" science, the ocean acidification narrative, the poverty-inducing reliance on wind and solar energies, and climate change alarmism in general.

Dr. Jon Christensen, his opponent, an [adjunct assistant professor in the Institute of the Environment and Sustainability](#), emphasized the

“consensus” and the “existential threat” of climate change, extolled the expansion of renewable energy sources like wind and solar in California, and insisted that politicians in the Golden State are focused on not burdening poor people with their “green” policies.

A summary highlighting some of the more interesting exchanges and their corresponding timelines follows.

(1) Dr. Soon: *CO2 a benefit, minimal sea level rise awaits* Dr. Christensen: *CO2 rise an existential, apocalyptic threat*

2:25 **Dr. Willie Soon** “They try to demonize carbon dioxide as if this is something that’s going to kill everybody. Which is really not true. ... CO2 has a lot of **potential benefit[s]**. There are some potential negatives. If it’s [CO2] going to cause sea levels to rise, we’re going to have 4 inches or **8 inches** or 12 inches...**per century.**”

3:30 **Dr. Jon Christensen** “The way I like to think about all this is...sunny with a chance of **apocalypse.** ... (3:59) There is **an existential threat out there.** (5:40) Everybody...who is under 40 is going to experience the effects of climate change, global warming, increase in sea level rise, flooding...in their lifetime.”

What the science says...

1. During 1958 to 2014, global sea levels rose at a rate of 1.3 mm per year to 1.5 mm per year, which is a rate of just over **3 inches per century**; the Greenland and Antarctica ice sheets have combined to add just **0.59 of an inch** of melt water to sea level rise since 1958 (**Frederiske et al., 2018**). There has been “**a recent lack of any detectable acceleration in the rate of sea level rise**” (**Parker and Ollier, 2017**).

2. Since the 1980s, coastal land area across the globe has been expanding, meaning that more land area is above sea level today (2015) than in 1985 (**Donchyts et al., 2016**). “*Coastal areas were also analysed, and to the scientists’ surprise, coastlines had gained more land – 33,700 sq km (13,000 sq miles) – than they had been lost to water (20,100 sq km or 7,800 sq miles). ‘We expected that the coast would start to retreat due to sea level rise, but the most surprising thing is that **the coasts are growing all over the world,**’ said Dr Baart. ‘We were able to create more land than sea level rise was taking ([press release](#)).’”*

3. Hurricane frequencies and intensities have been declining (**Truchelut and Staeling, 2018, Zhao et al., 2018, Klotzbach et al., 2018**).

4. Extreme weather events (floods, droughts) have decreased in frequency and intensity (or showed no detectable change) ([Zhang et al., 2017](#), [McCabe et al., 2017](#), [Cheng et al., 2016](#), [Hodgkiins et al., 2017](#), [McAneney et al., 2017](#)).

5. In recent decades 92% of Canadian polar bear subpopulations have remained stable or increased, leading scientists to conclude that “it seems unlikely that polar bears (as a species) are at risk from anthropogenic global warming” ([York et al., 2016](#)). Local Inuit populations even report that there are “too many polar bears now” ([Wong et al., 2017](#)). There has also been a “marked and steady increase” in penguin populations between 1982 and 2015 ([Che-Castaldo et al. 2017](#)).

(2) Dr. Soon: *Ocean acidification is a myth.*
Dr. Christensen: *Ocean acidification is science.*

11:21 **Dr. Willie Soon** “Can I say something about ocean acidification? **It’s a myth.** ... The ocean has something you can measure. Basically, it’s called ion of the hydrogen. It’s called [the] pH scale. You have 0 to 14. Seven is neutral. Seven to 0 is acidic. Seven to 14 is called basic. The ocean is right about 8.03, 8.04 [non-acidic]. But deep inside the ocean, about 2,000 meters down, it’s actually very acidic. If you wanna talk about ocean acidification – it’s one of the most dangerous myths that there is. A very radical one. It’s not sensible. Who created this myth, actually...?”

12:23 **Dr. Jon Christensen** “**They call it [ocean acidification] science.**”

12:25 **Dr. Willie Soon** “No, it’s not even science, excuse me, because... Do you know what the pH of rainwater is? It’s 5.5. ([Wikipedia.com](#): “*Ordinary rainwater is naturally acidic with a pH between 5.0 and 5.5.*”) ... [T]hat means you have to outlaw all the [naturally acidic] rain that’s falling down? You want to outlaw all the slightly acidic water that is sitting on the bottom of the ocean?”

13:05 **Dr. Jon Christensen** “No...It’s not that hard to actually read the science. It can seem a little bit daunting but anybody who can read can work their way through many of these papers and you can see that there’s a wide variety of findings and results and conclusions... There is in science a fair degree of certainty on a lot of things. ... What we know is

that there's a wide spectrum of results here and we need to look at the data and the whole big picture of the science and not just write it off one way or the other."

15:08 **Dr. Willie Soon** "Jon, my whole point is that ocean acidification is an extreme. It is one of the most extreme things they could come up with because they are not able to find the fingerprint of the carbon dioxide warming of the atmosphere so then they started to come up with this new scheme [ocean acidification]. Next thing...they're going [to claim] carbon dioxide is killing all of the polar bears. It's going to melt all the ice sheets. It's completely not even true."

What the science says...

McElhany, 2017

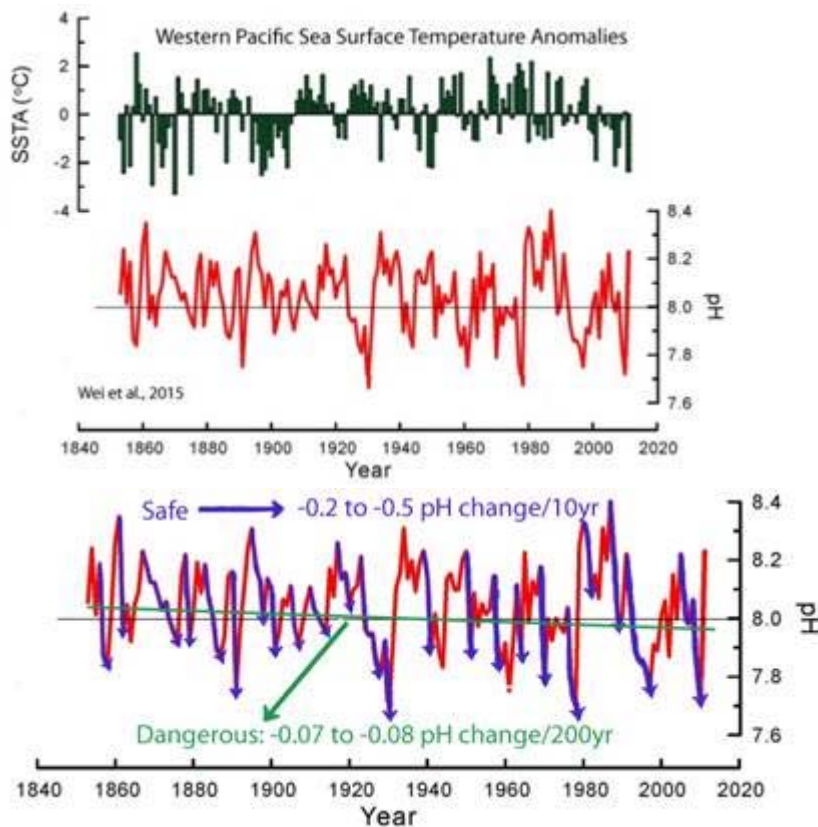
*"Documenting an effect of OA [ocean acidification] involves showing a change in a species (e.g. population abundance or distribution) as a consequence of anthropogenic changes in marine carbonate chemistry. **To date, there have been no unambiguous demonstrations of a population level effect of anthropogenic OA [ocean acidification], as that term is defined by the IPCC. ... [I]t is important to acknowledge that **there are no studies that directly demonstrate modern day effects of OA [ocean acidification] on marine species.**"***

Duarte et al., 2014

*"[T]here have been a few claims for already realized impacts of ocean acidification on calcifiers, such as a decline in the number of oysters on the West Coast of North America (Barton et al. 2012) and in Chesapeake Bay (Waldbusser et al. 2011). However, **the link between these declines and ocean acidification through anthropogenic CO₂ is unclear.** Corrosive waters affecting oysters in hatcheries along the Oregon coast were associated with upwelling (Barton et al. 2012), not anthropogenic CO₂. The decline in pH affecting oysters in Chesapeake Bay (Waldbusser et al. 2011) was **not attributable to anthropogenic CO₂** but was likely attributable to excess respiration associated with eutrophication. Therefore, there is, as yet, **no robust evidence for realized severe disruptions of marine socioecological links from ocean acidification to anthropogenic CO₂,** and there are significant uncertainties regarding the level of pH change that would prompt such impacts. [D]espite the strong mechanistic or physiological basis for a role of warming in coral bleaching and coral growth, **a robust demonstration of a direct causal link between global warming and global coral bleaching over decadal time scales has not yet been produced.**"*

[Wei et al., 2015](#)

*“It is worth noting that the errors of these estimates are fairly large with RSD of 65% for that these two time-series **do not show significant decreasing trend for pH**. Despite of such large errors, estimated from these rates, **the seawater pH has decreased by about 0.07–0.08 U over the past 200 years in these regions.** ... **The average calculated seawater pH over the past 159 years was 8.04 [with a] a seawater pH variation range of 7.66–8.40.**”*



(3) Dr. Soon: *Thank God for fossil fuels.*

Dr. Christensen: *We may fly planes with bio-gas.*

8:27 **Dr. Willie Soon** “You gotta stick to the facts. Wind and solar – oh boy, so useful. Every time I look at this sad situation of all these landfalling hurricanes (Irma, Harvey)...the only thing I have to say about that is ‘Thank God for fossil fuels’. ... Fossil fuels offer the most energy density. There is no viable energy replacement. Wind and solar could never do anything...”

9:25 **Bryan Dey** “You’re never gonna get a plane off the ground with wind and solar.”

9:30 **Dr. Jon Christensen** “You may [get a plane off the ground] with bio-gas, though.”

What the science says...

DeCicco et al., 2016

“Biofuels increase, rather than decrease, heat-trapping carbon dioxide ... The researchers conclude that rising biofuel use has been associated with a net increase—rather than a net decrease, as many have claimed—in the carbon dioxide emissions that cause global warming.”

(4) Dr. Christensen: *In CA, we believe, we’re doing something, and we’re helping the poor*

17:03 **Dr. Jon Christensen** “The majority of people in every congressional district in the United States believes that climate change is real, it’s caused by people, it will harm people in the future, and we should do something about it. [...] Great vast majorities of people in California [are believers], where **we have decided we’re going to do something about it**...we’re on that path which I call the California way or the Paris way where we continue to make commitments, continue to raise our commitments, continue to ratchet down...”

17: 49 **Bryan Dey** “But all the [green] solutions that come from the Left are really going to be punishing poor people the most...”

17:54 **Dr. Jon Christensen** “No, they’re not, actually...”

17: 56 **Bryan Dey** (adamant) “Yes, they will! **It’s poor people that are going to suffer the most!**”

Californians in the audience clap and cheer

18:00 **Panelist** “We’ve got people [in the audience] who love poor people.”

18:03 **Dr. Willie Soon** “Oh, poor people are clapping. Can I say something?”

18:12 **Dr. Jon Christensen** “Look at the laws in California. Every single law that is being passed about climate change, cap-and-trade, environmental... has explicit language that is to make those benefits go to poor, disadvantaged communities...”

Californians in the audience shout “No, not true!”

18:30 **Bryan Dey** “If your electric bill goes up by 20 percent...”

18:34 **Dr. Jon Christensen** (to audience) “I don’t know who’s saying that [green policies don’t help poor people] but I can show it to you — this is what I do my research on.”

28:20 **Question from audience** “Do you think it’s appropriate for the government to use force and tax penalties which really affect middle income and lower income people based on climate science that is obviously hotly contested?”

28:50 **Dr. Jon Christensen** “In California, anyway, ... [politicians] make sure that those burdens do not fall on lower income people.”

What the science says...

Environmental Progress (February, 2018)

*“The burden of higher cost electricity and benefits of renewable energy subsidies fall unevenly on Californians. Between 2007 and 2014, the highest-income 40 percent of California households received three times more in solar subsidies — valued between \$10,000 and \$20,000 per household — as the lowest-income 40 percent. **California households with over \$100,000 in annual income benefited from energy efficiency subsidies at twice the rate of households whose income was under \$50,000.**”*

Poorest households hit hardest by UK climate change levy despite using least energy (March, 2018)

*“We found that, in a year, the richest households each consumed on average the same amount of energy that would be produced by 12.7 tonnes of oil, compared to 3.3 tonnes for the poorest households. But **the poorest spent a much greater proportion of their income (10%) on energy than the richest (3%).** And the energy used for heating and powering their homes — the part that their climate change levy bill is measured on — represented a much greater proportion of their overall energy use.”*

*“This means that **adding the climate change levy to household energy bills hits the poorest households hardest.** Energy bills account for a much greater share of their household income and more*

of their energy use is charged. In fact, the levy only affects a quarter of the total energy consumption of the richest households, compared to 53% for the poorest households. As a result, the richest homes use nearly four times more total energy than the poorest but only pay 1.8 times more towards energy policy costs.”

(5) Dr. Christensen: *CA economy is growing*

25:55 **Dr. Jon Christensen** “California’s economy has been growing while emissions have been decreasing.”

What the science says...

Los Angeles Times (January, 2018)

*“Guess which state has the **highest poverty rate in the country?** Not Mississippi, New Mexico, or West Virginia, but **California, where nearly one out of five residents is poor.**”*

(6) Dr. Soon: *Science does not work by consensus*

19:13 **Dr. Willie Soon** “I’m very, very sorry. Science does not work by consensus. ... This nonsense about consensus...”

19:50 **Dr. Willie Soon** “This 97 percent consensus... We have published a peer-reviewed paper (Legates et al., 2013) that shows that it’s only 41 papers out of 12,000. So it’s **only 0.3 percent.**”

What the science says...

Legates et al., 2013

*“Cook et al. (2013), after a subjective review of only the abstracts of 11,944 papers on climate change which “matched the topics ‘global climate change’ or ‘global warming’” (p. 1), conclude that 97.1 % of those that expressed an opinion endorsed the hypothesis as defined in their introduction (i.e., the standard definition). However, 66.4 % percent of the abstracts had expressed no position. Thus, 32.6 % of the entire sample, or 97.1 % of the 33.6 % who had expressed an opinion, were said to be in agreement with the standard definition. However, **inspection of the authors’ own data file showed that they had themselves categorized only 64 abstracts, just 0.5 % of the sample, as endorsing the standard definition [a majority of the warming since 1950 was human-caused]. Inspection shows only 41 of the 64 papers, or 0.3 % of the sample of 11,944 papers, actually endorsed that definition.**”*

(7) Dr. Soon: *CO2 increase is greening the planet*

21:20 **Dr. Willie Soon** “One of the most powerful effects of carbon dioxide is not on temperature because if you talk about greenhouse gases it’s water vapor that’s more important [than] CO2. [...] The only proof we have so far is that it [CO2] is greening the planet. **Twenty to fifty percent of the [Earth’s] vegetated area has been greening, only 4% has been showing a little browning.** That tell[s] you that the overwhelming effect of this [increase in CO2] is fertilization of the atmosphere. [...] We’re [currently] in a CO2 starvation state. Today our air has only 400 parts per million. If you don’t know what that means, it’s 4 cents for every hundred dollars.”

What the science says...

[Zhu et al., 2016](#)

*“Global environmental change is rapidly altering the dynamics of terrestrial vegetation, with consequences for the functioning of the Earth system and provision of ecosystem services. Yet how global vegetation is responding to the changing environment is not well established. Here we use three long-term satellite leaf area index (LAI) records and ten global ecosystem models to investigate four key drivers of LAI trends during 1982–2009. **We show a persistent and widespread increase of growing season integrated LAI (greening) over 25% to 50% of the global vegetated area, whereas less than 4% of the globe shows decreasing LAI (browning).** Factorial simulations with multiple global ecosystem models suggest that **CO₂ fertilization effects explain 70% of the observed greening trend**, followed by nitrogen deposition (9%), climate change (8%) and land cover change (LCC) (4%). **CO₂ fertilization effects explain most of the greening trends in the tropics, whereas climate change resulted in greening of the high latitudes and the Tibetan Plateau.**”*

(8) Dr. Christensen: *The goal is to increase the cost of carbon*

29:30 **Dr. Jon Christensen** “**A lot of what’s happening is figuring out ways to use the market to increase the cost of carbon...** (Audience: No! No!) ...to take into account the cost that we’re paying in health and environmental effects...which are externalities that have not been factored in. ... **Those revenues** [from increasing the cost

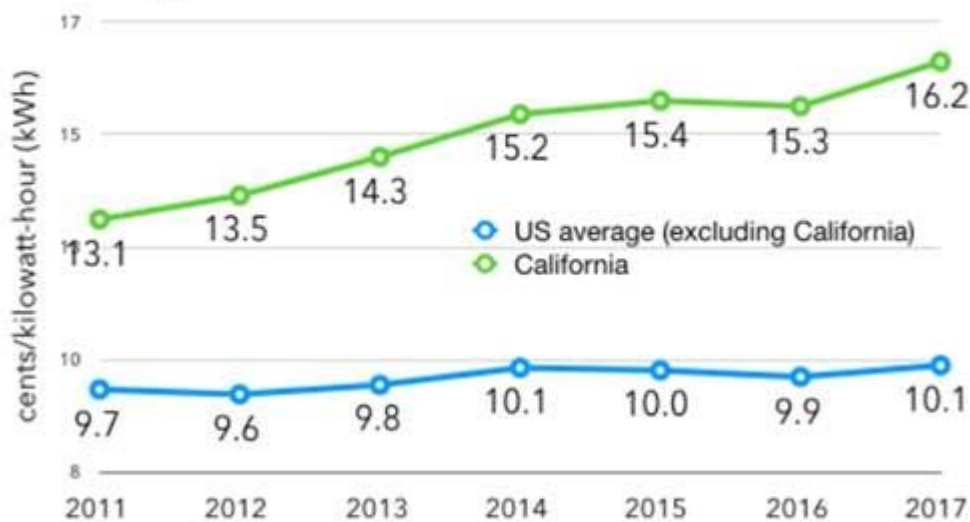
of carbon] are used to benefit the whole state of California with particular attention to people who are lower income.”

What the science says...

Environmental Progress (February, 2018)

*“Between 2011 and 2017, California’s electricity prices rose five times faster than they did nationally. **Today, Californians pay 60 percent more, on average, than the rest of the nation, for residential, commercial and industrial electricity.**”*

Electricity prices in California rose 5x more than in rest of U.S.



Source: US Energy Information Administration, 2017.

“California’s high penetration of intermittent renewables such as solar and wind are likely a key factor in higher prices.”

“Economists agree that “the dominant policy driver in the electricity sector [in California] has unquestionably been a focus on developing renewable sources of electricity generation.”

“High levels of renewable energy penetration make electricity expensive around the world, not just in California. As Germany deployed high levels of renewables over the last 10 years it saw its electricity prices rise 34 percent. Today, German electricity costs twice as much as that in neighboring France.” *“As wind and solar capacity climbs, the returns of usable power diminish because of increasing curtailment during surges that the grid cannot absorb. More and more intermittent capacity has to be pushed onto the grid to get*

*less and less additional renewable electricity. The dynamic of soaring overcapacity and falling prices is the inevitable result of the **fundamental inability of intermittent wind and solar generators to efficiently match supply to demand.***”

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