

# **Last class**

Global Warming Science, EPS101

**Eli Tziperman**

<https://courses.seas.harvard.edu/climate/eli/Courses/EPS101/>

We covered a lot!



Greenhouse

# We covered a lot!



Greenhouse



Temperature

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Greenhouse



Temperature



Sea level



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Greenhouse



Temperature



Sea level



Acidification

# We covered a lot!



Greenhouse



Temperature



Sea level



Acidification



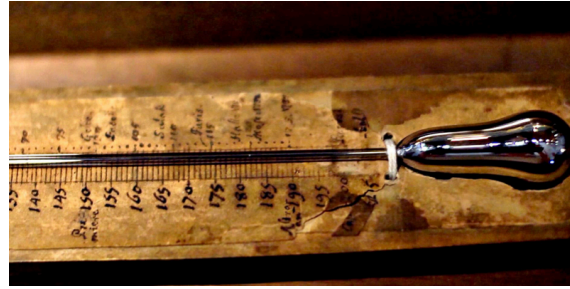
ocean circulation



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Greenhouse



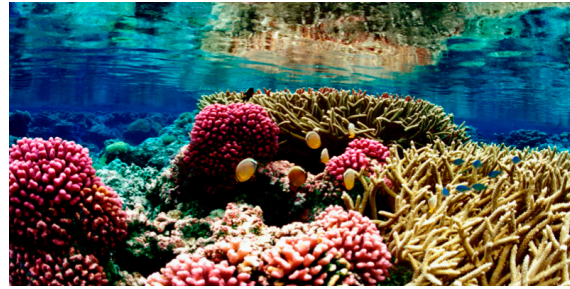
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Clouds



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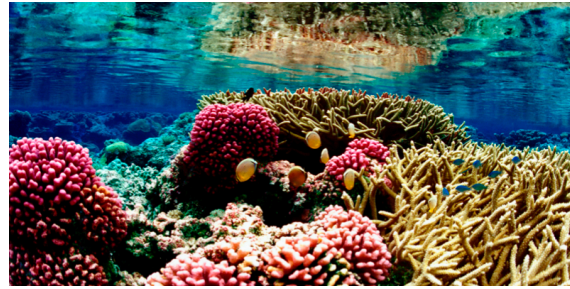
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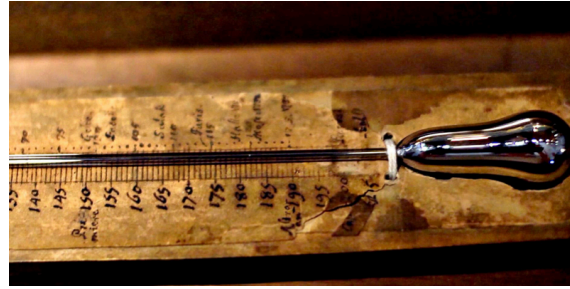
Hurricanes



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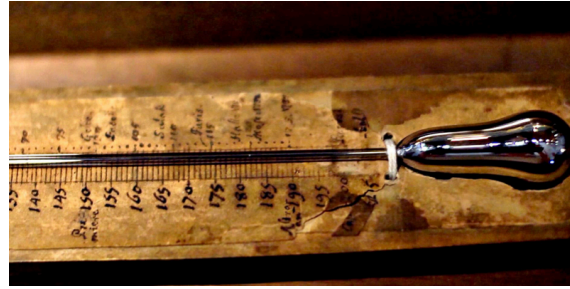
Mountain glaciers



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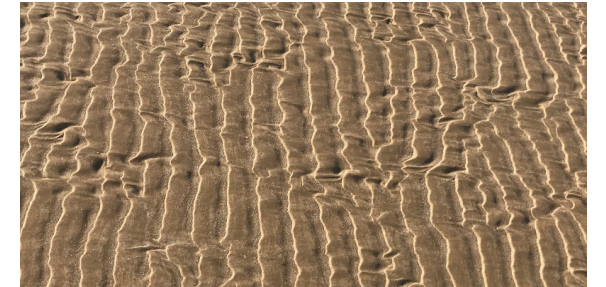
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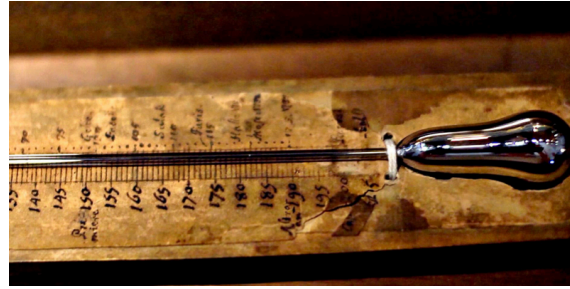
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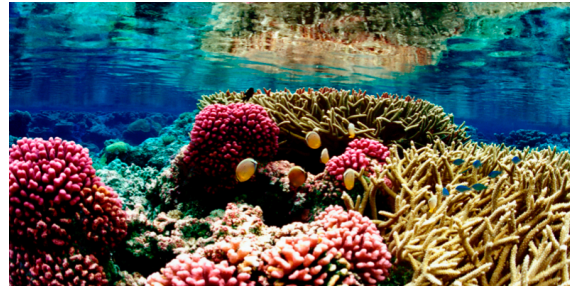
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Forest fires



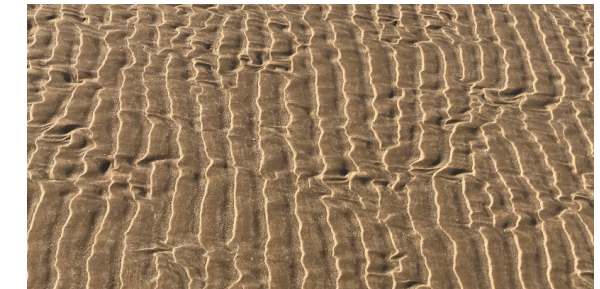
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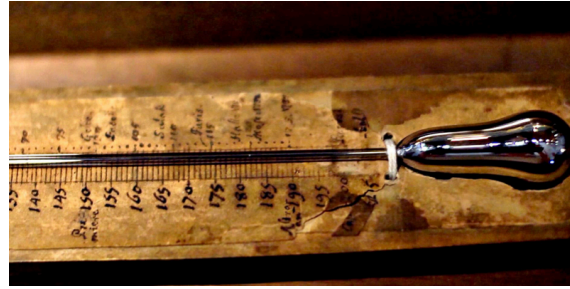
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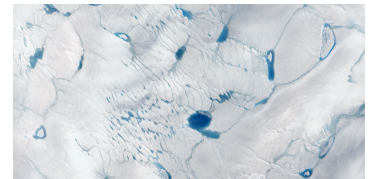
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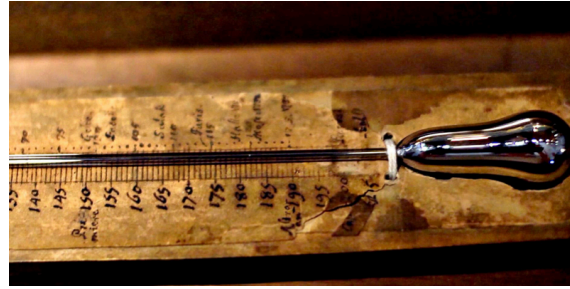
Greenland, Antarctica



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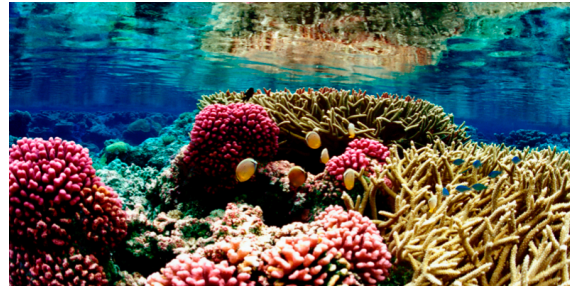
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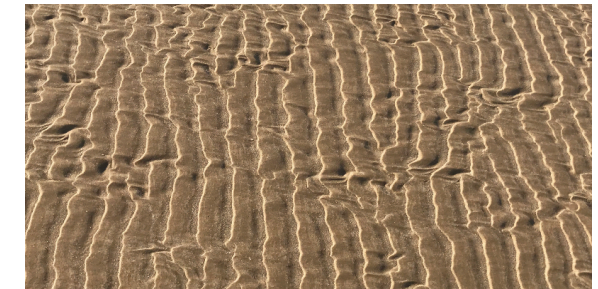
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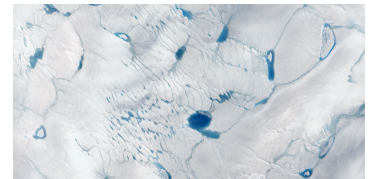
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Greenland, Antarctica



Droughts, floods

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- S
- M

## Possible

- Hurricanes
- Drought
- Forest

## Even more

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Hopefully, you understand the bottom line: don't be a "believer" or a "denier" — Look at the facts!

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**Is there hope??**

# **The Great Horse Manure Crisis of 1894**, by Ben Johnson

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In the face of a problem with no apparent solution, people often quote ‘The Great Horse Manure Crisis of 1894’, urging people not to despair, something will turn up!



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3. "Nuclear power will never be a significant source of energy." Lewis Mumford, 1946

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➔ We have had zero ability to predict major technological innovations in the past

# Billy Durant and the Founding of General Motors

Dr. Burton W. Folsom, September 8, 1998, <https://www.mackinac.org/V1998-28>

On September 16, 1908 ... Billy Durant founded General Motors ... Durant actually made his first fortune betting against cars: he was the largest maker of carriages in the U. S. In 1886, he started the Flint Road Cart Company; after 15 years [selling] carriages in all sizes & colors, he transformed a \$2,000 start-up into a \$2 million business with sales around the world.



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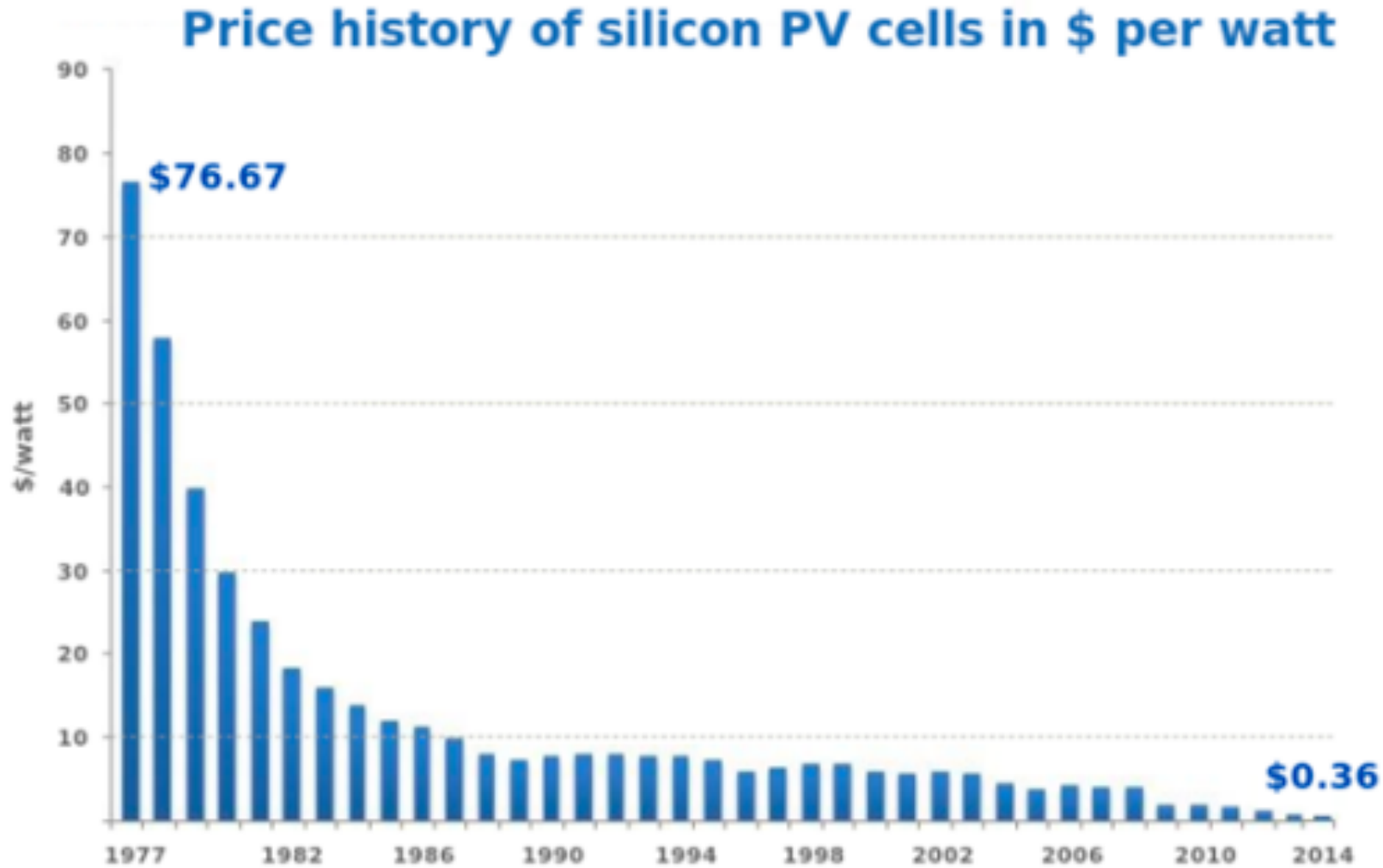
By 1900, the carriage business was in decline. Costs were rising, and the public was turning to automobiles. He refused government safety regulations because he believed cars were smelly, noisy, and dangerous. Instead of calling for government safety regulations, he bought the Buick, a local car with few sales and large debts.

In 1904 ... the salesman ... entered the Buick in a New York auto show—and came home with orders for 1,108 cars: not bad considering that only 37 Buicks had ever been made. In 1908, after just 4 years of making cars, he had the best-selling car in the business. The carriage king had become the auto genius.

He formed General Motors in 1908, consolidating 13 car companies & 10 parts manufacturers.

→ A single person can make a difference...

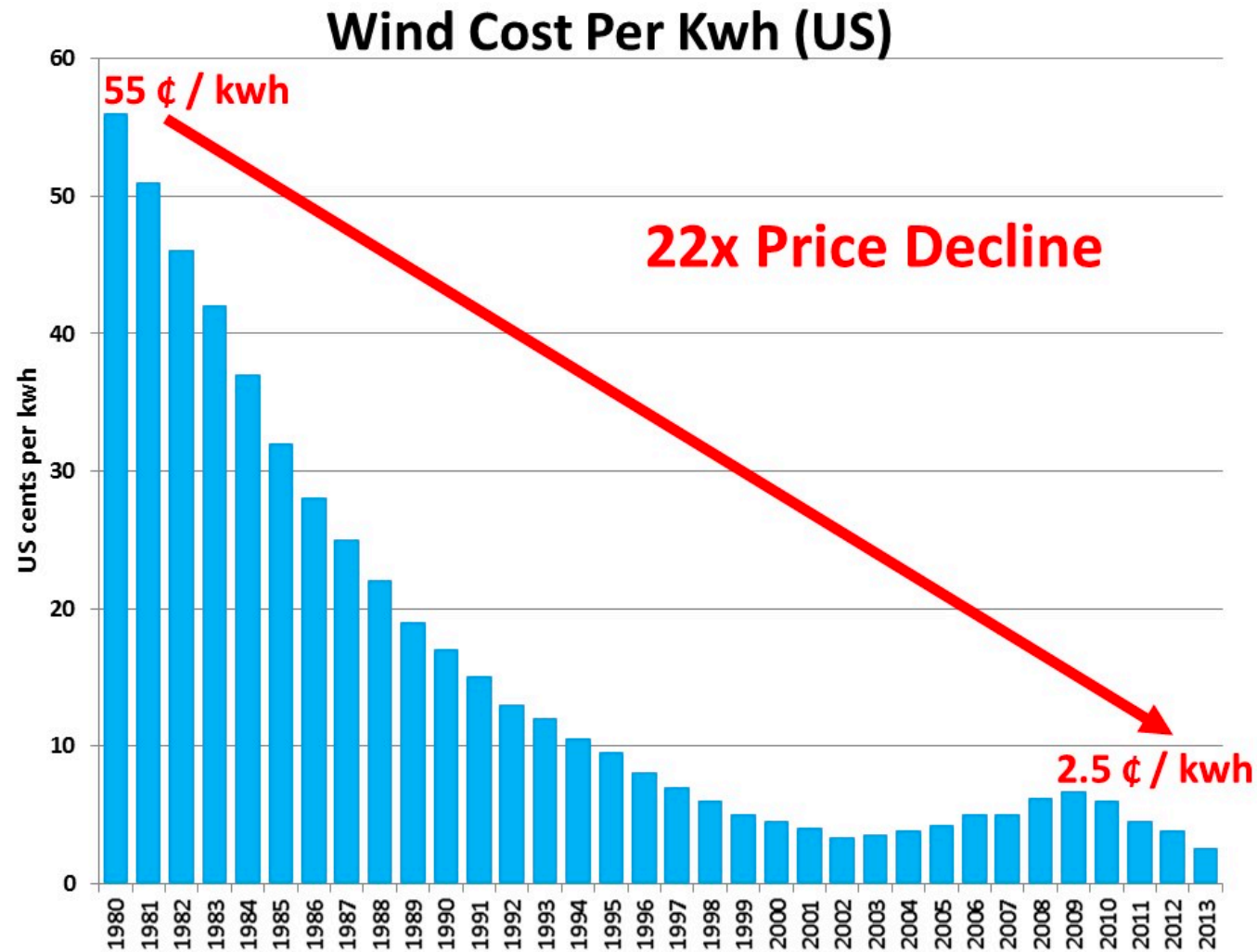
# The hope: Solar energy, by Albert Wenger



Source: Bloomberg, New Energy Finance & pv.energytrend.com

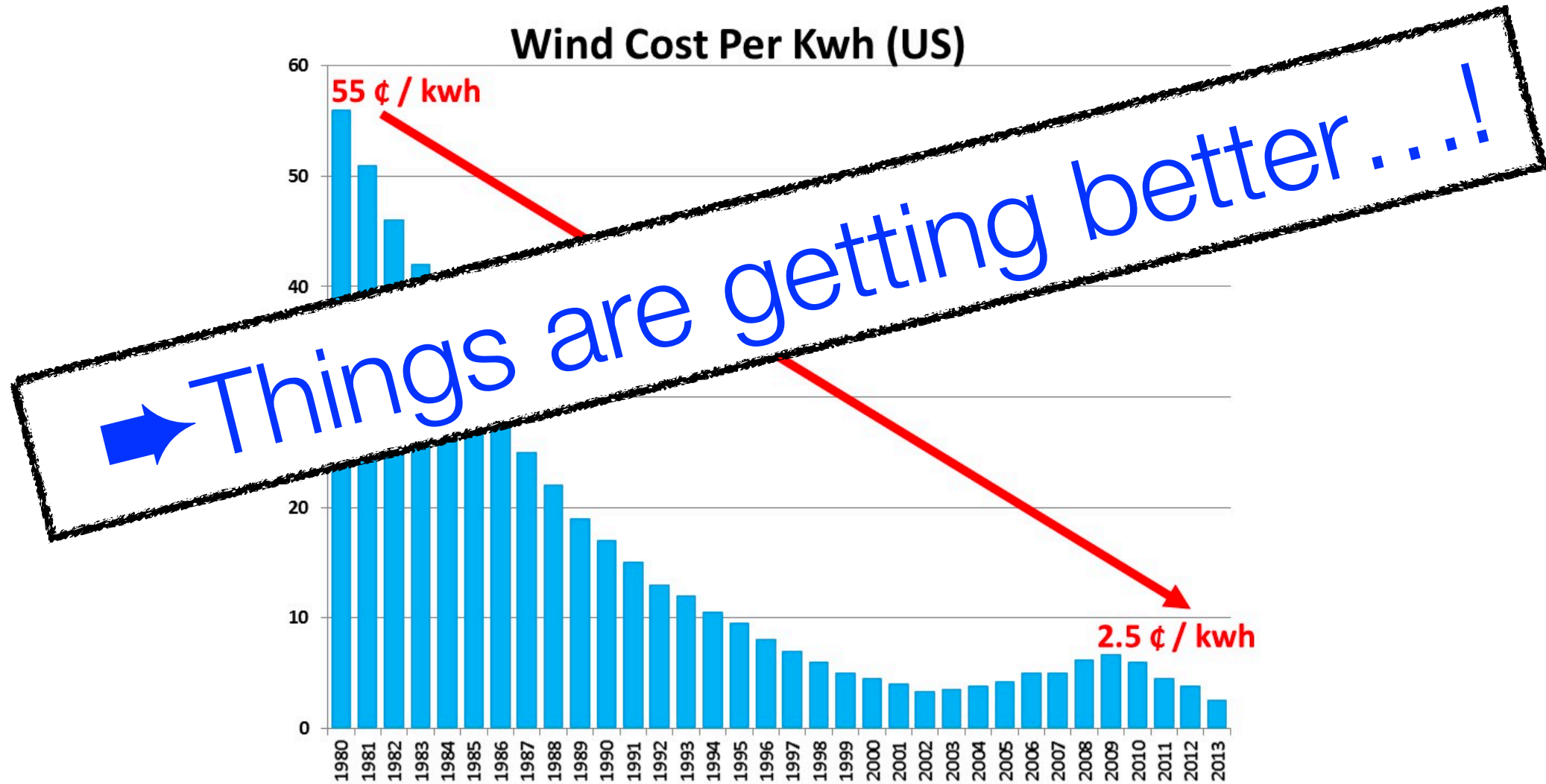
<https://continuations.com/post/125340123900/solar>

# The hope: The Renewable Energy Revolution, by Ramez Naam





# The hope: The Renewable Energy Revolution, by Ramez Naam



Remain optimistic! 🌞

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**Thanks to our TFs Jacob, Kara, and Sophie!!!**

Remain optimistic! 🌞

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And thanks for a fun semester!