



# GLOBAL CLIMATE CHANGE, AND WHAT WE CAN DO ABOUT IT

## STEVE MILLER OCT 12, 2020

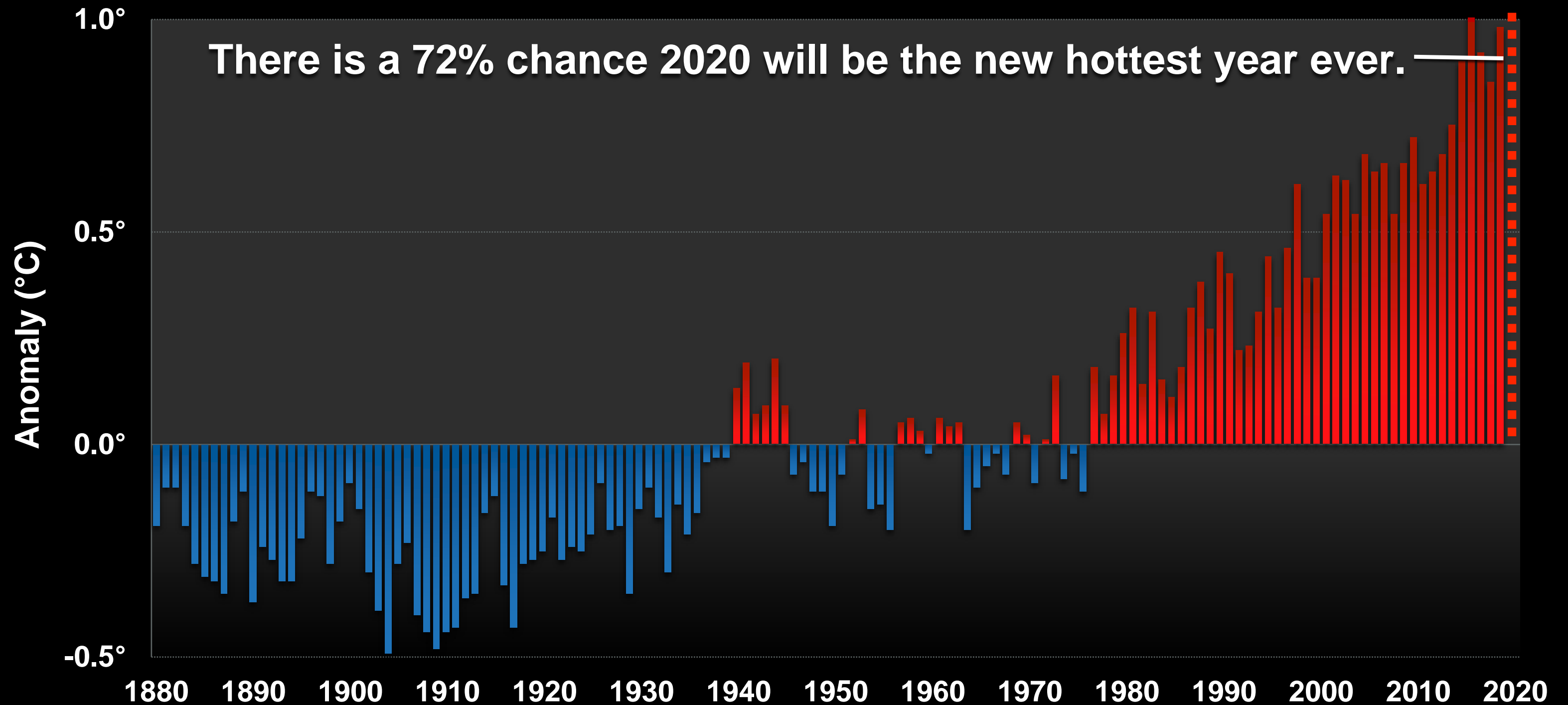
CLIMATE CHAIR, SIERRA CLUB NJ SHORE GROUP  
CO-FOUNDER, MIDDLETOWN FOR CLEAN ENERGY  
TRAINED CLIMATE REALITY LEADER  
[STEVE MILLER@COMCAST.NET](mailto:STEVE MILLER@COMCAST.NET)  
[HTTP://ELECTRIC.SMILLER.ORG](http://ELECTRIC.SMILLER.ORG)

**Our mission is to leave a legacy of a livable world  
for our children and grandchildren.**




# Global Surface Temperature – Departure from Average

1880 – 2019



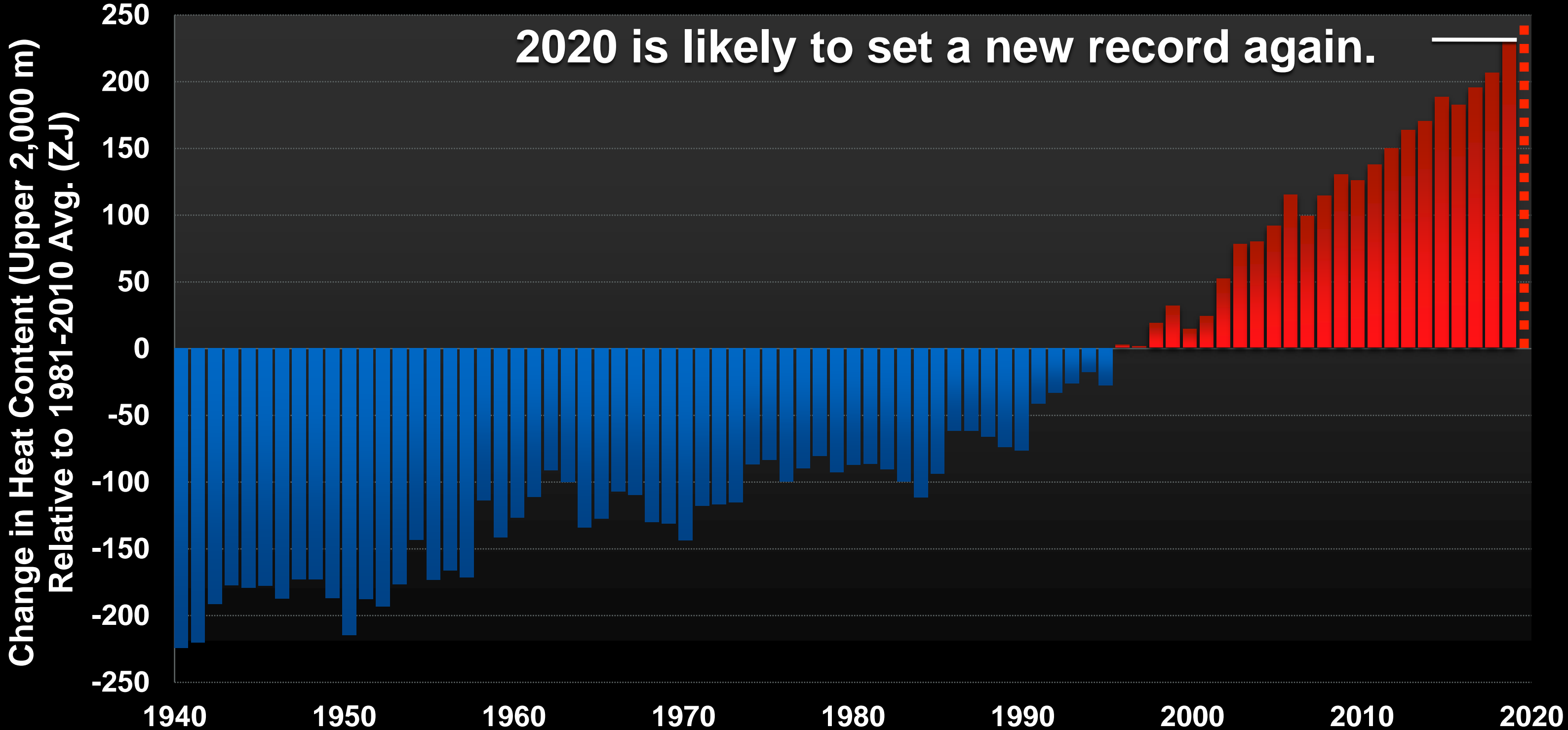




93% of the extra Heat  
trapped by manmade  
global warming pollution  
goes into the  
Ocean

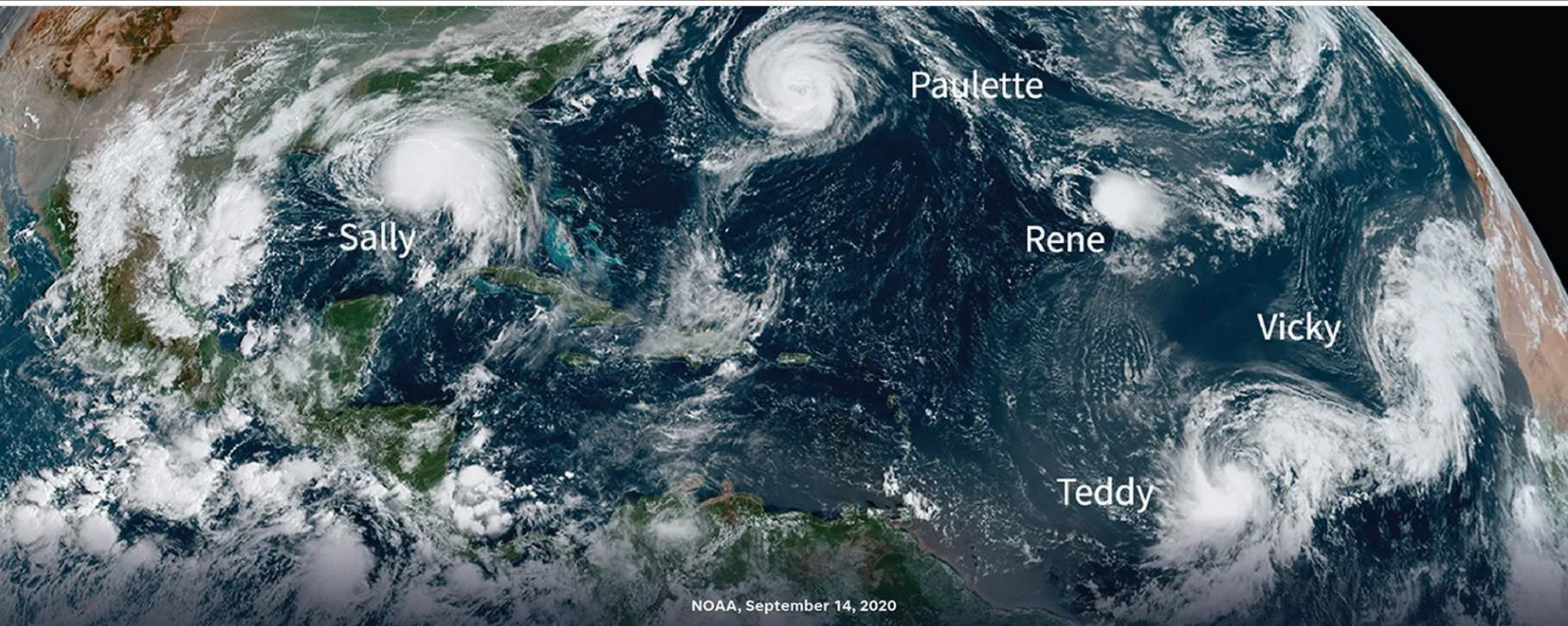
# Ocean Temperatures Set a New Record in 2019

2020 is likely to set a new record again.



Data: Cheng, L. J., and J. Zhu, 2018: "2017 was the warmest year on record for the global ocean," *Advances in Atmospheric Sciences*, 34(3)





NOAA, September 14, 2020

**10/8/2020  
USA TODAY**

## **Why are we having such an active hurricane season?**

In an era of busier-than-normal hurricane seasons, the 2020





WESTVILLE, NJ  
JUNE 20, 2019



# U.S. Counties Most Vulnerable to Disaster

Brooks, TX	Dimmit, TX	Duval, TX	Luna, NM	Zavala, TX
Cibola, NM	Presidio, TX	Imperial, CA	Evangeline, LA	Culberson, TX

The population in the 10 U.S. counties rated most vulnerable to disasters by the Centers for Disease Control and Prevention is **81% minority**, on average.



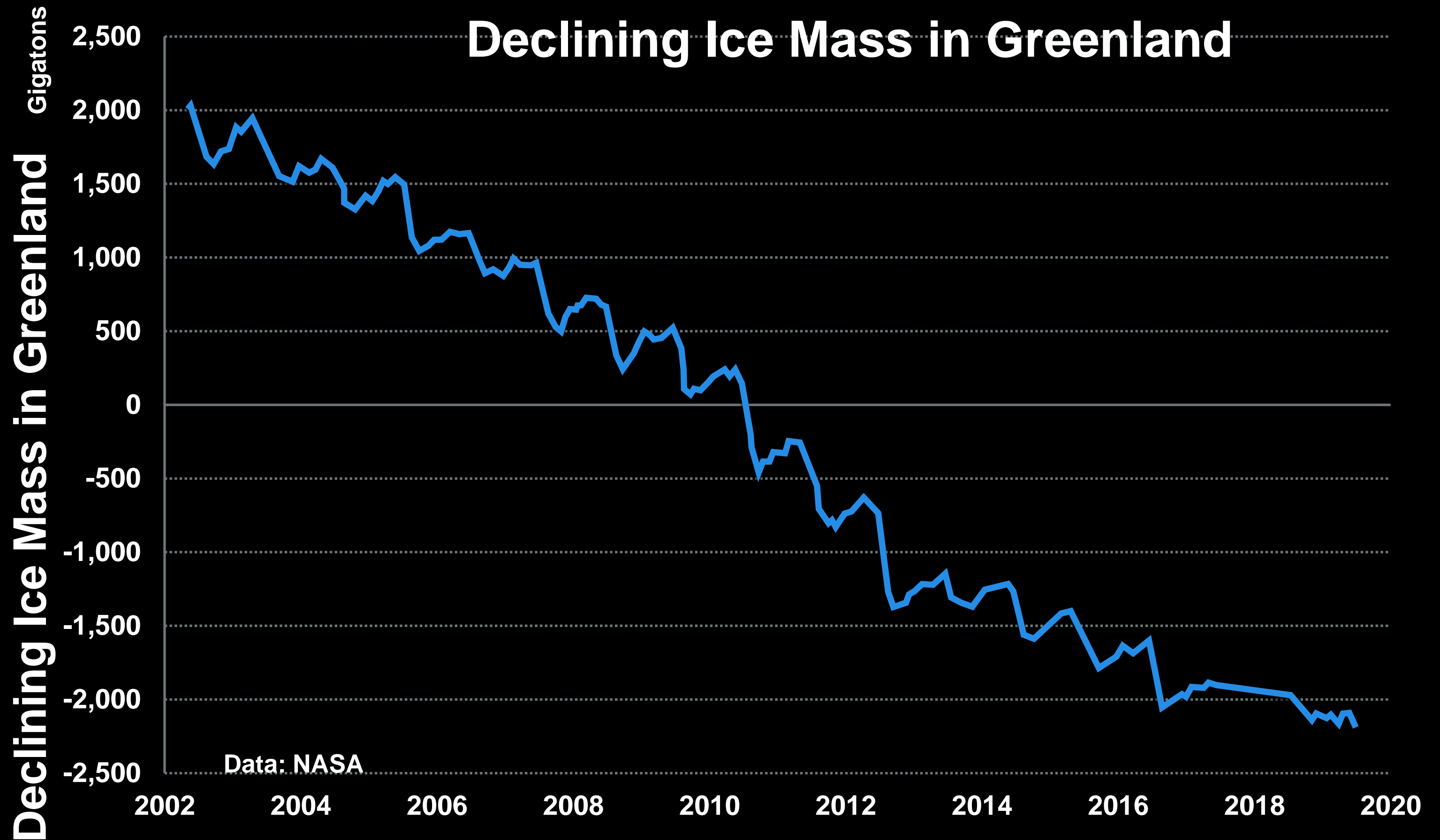
# California, August 13, 2020

The Lake Fire grew to 10,000 acres within 1 day,



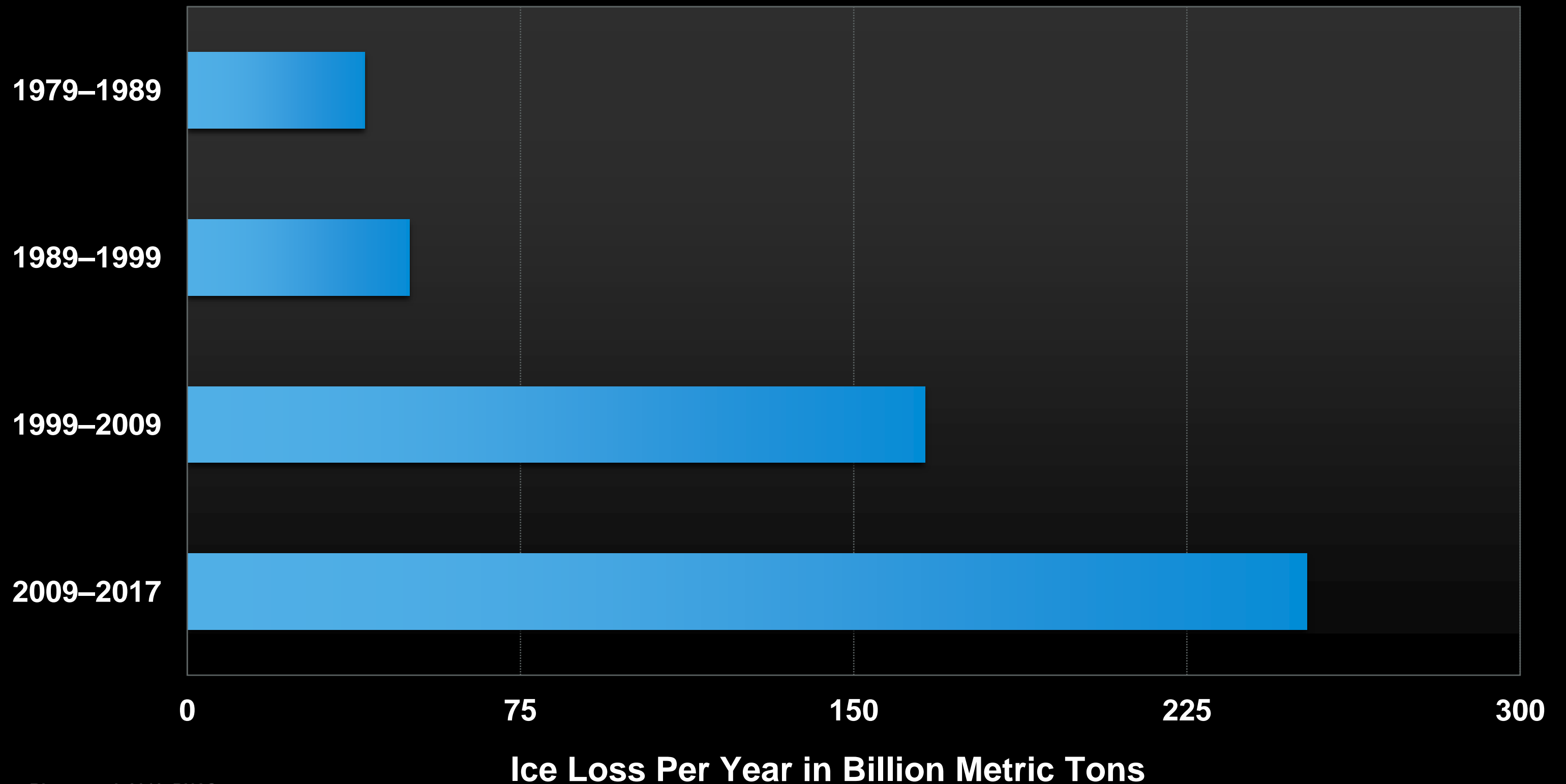


# Declining Ice Mass in Greenland





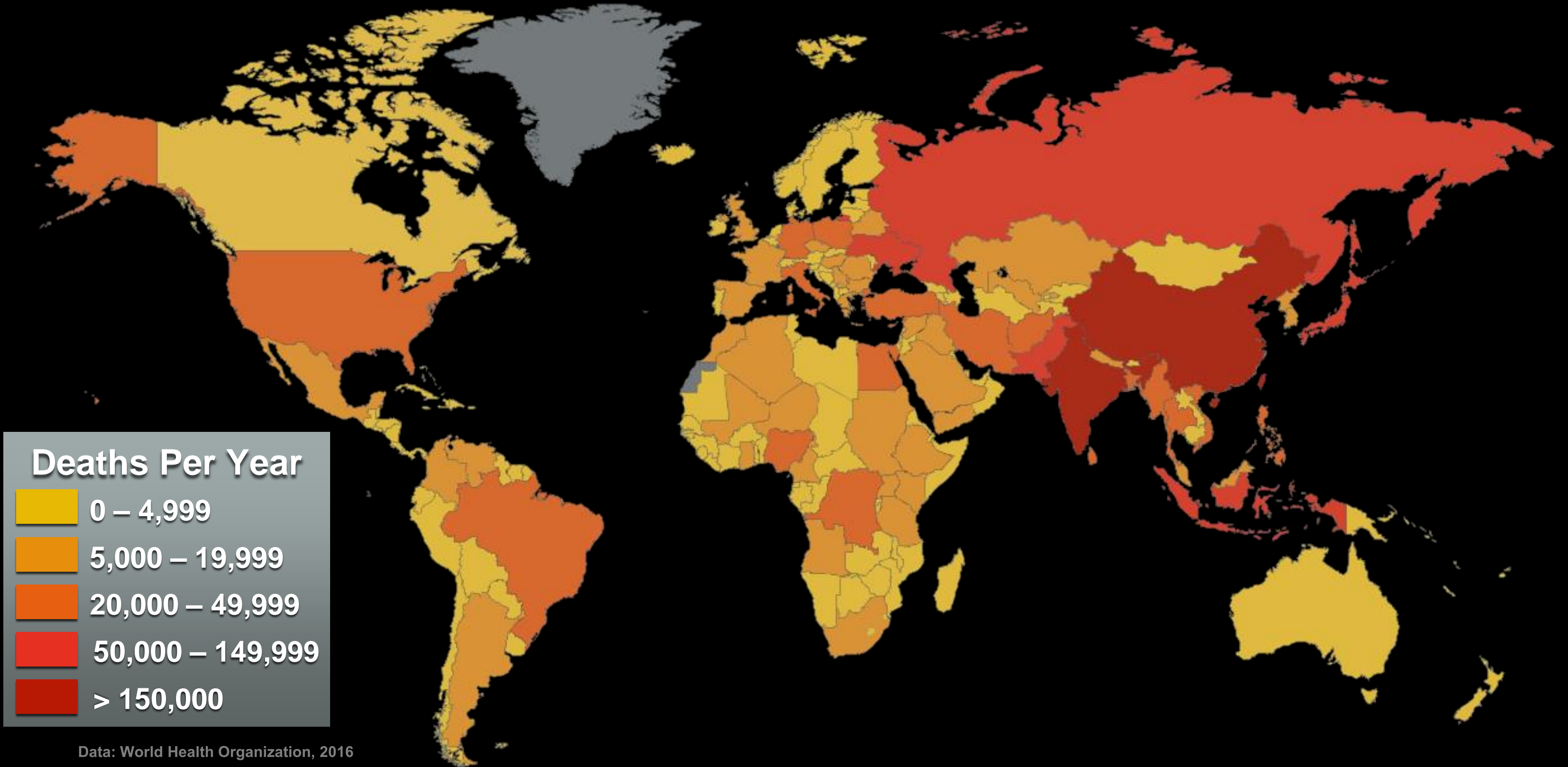
# Antarctic Ice Loss



Data: Rignot et al, 2019, PNAS



# Deaths Attributable to Ambient Air Pollution





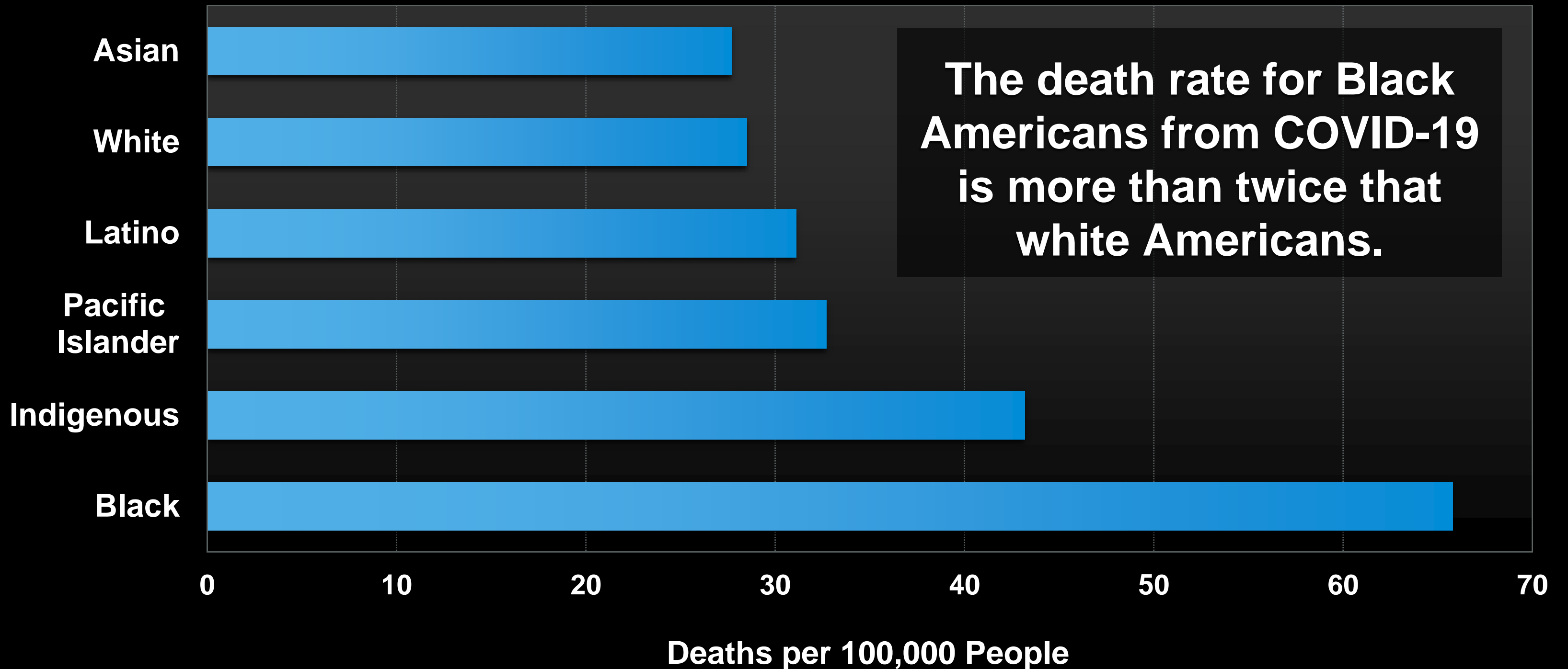
**Sichuan Provincial Capital, China**

**324 cities in China  
found 15 – 22%  
increase in COVID-  
19 in areas with  
elevated NO<sub>2</sub> and  
PM 2.5 particulates**



# U.S. COVID-19 Deaths, by Race

Through June 23, 2020





**We have  
the solutions  
at hand...**

# Global Wind Energy Capacity

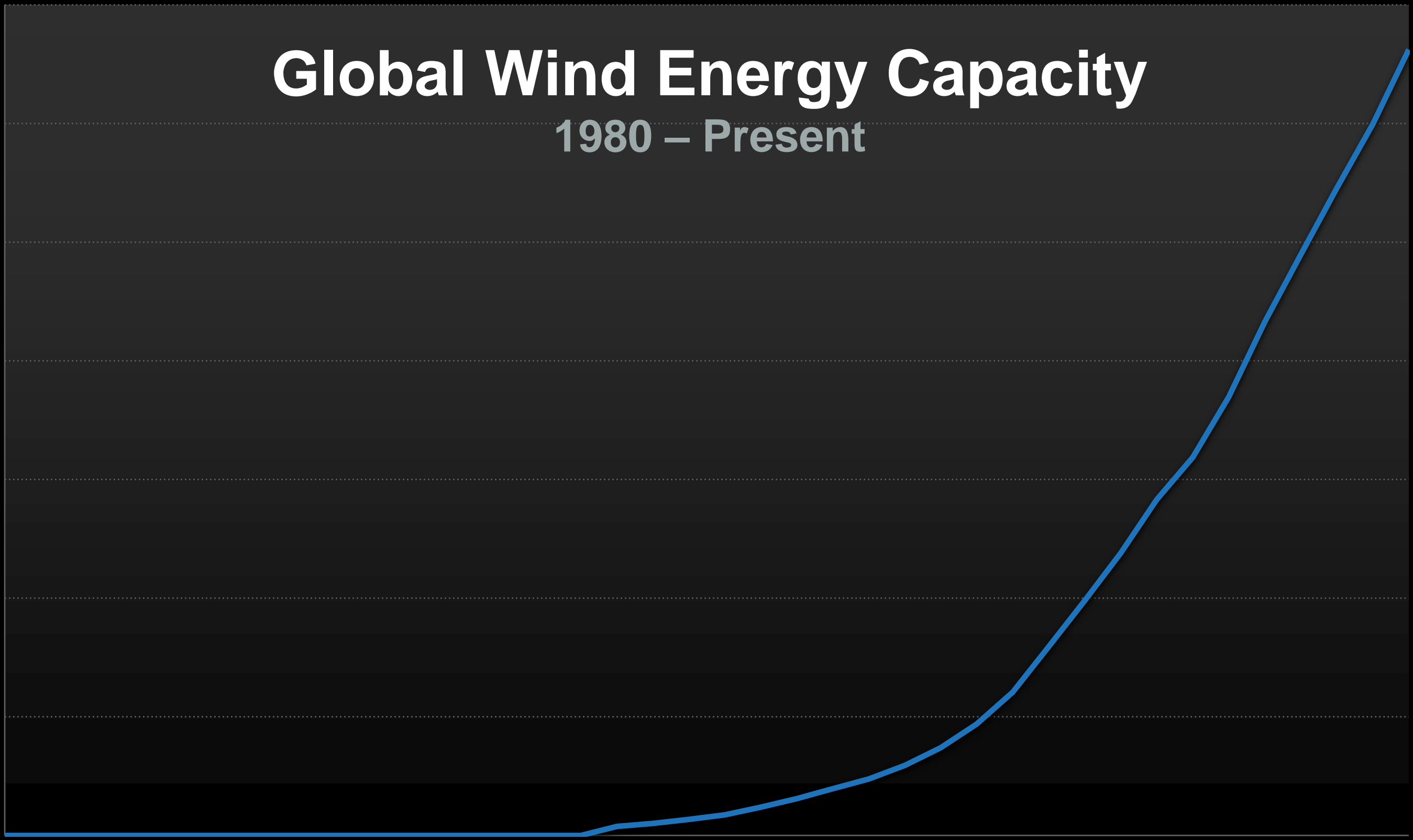
## 1980 – Present

Wind Capacity (Megawatts)

700,000  
600,000  
500,000  
400,000  
300,000  
200,000  
100,000

1980 1985 1990 1995 2000 2005 2010 2015 2019

Data: Earth Policy Institute/Bloomberg New Energy Finance

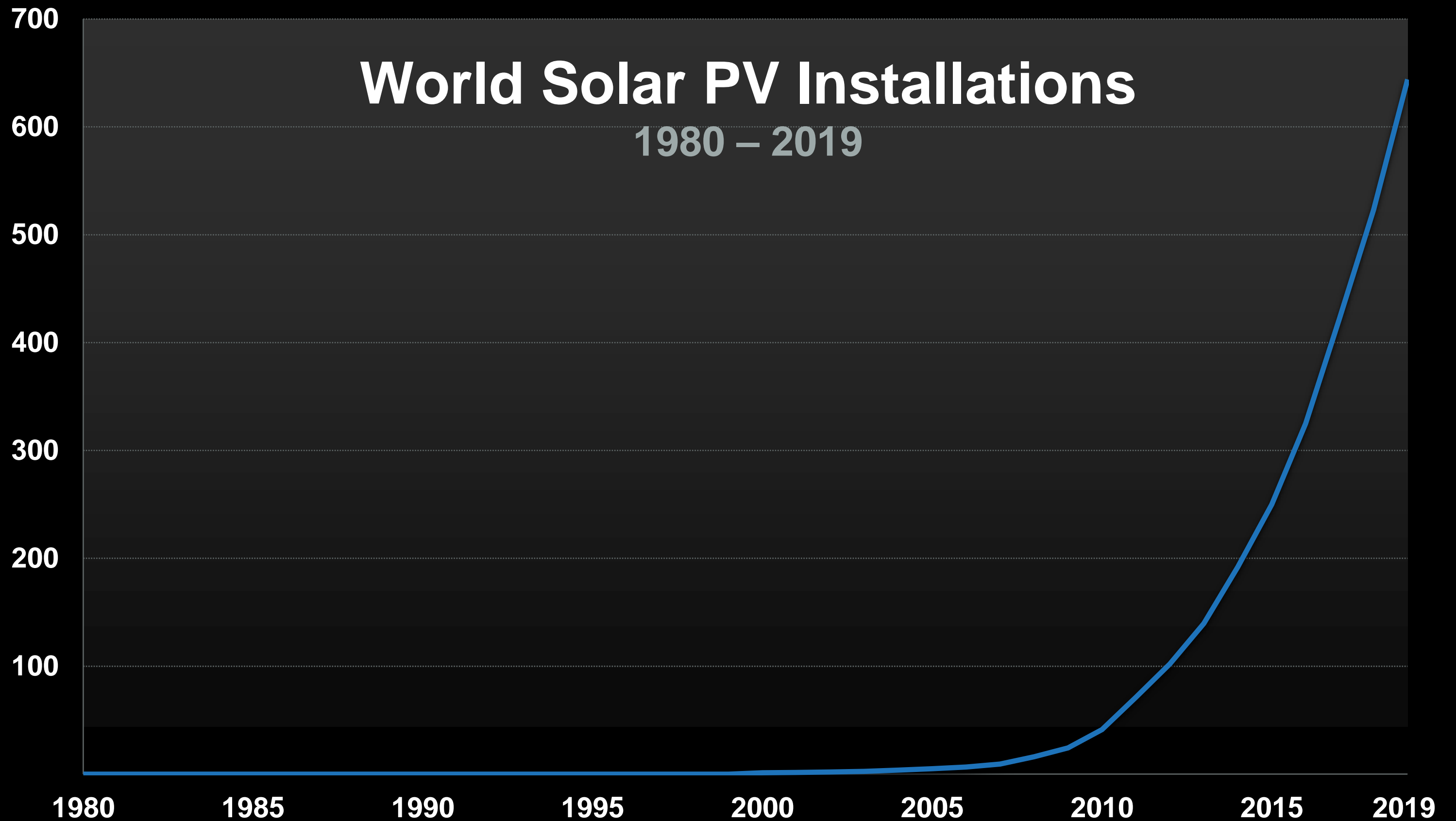


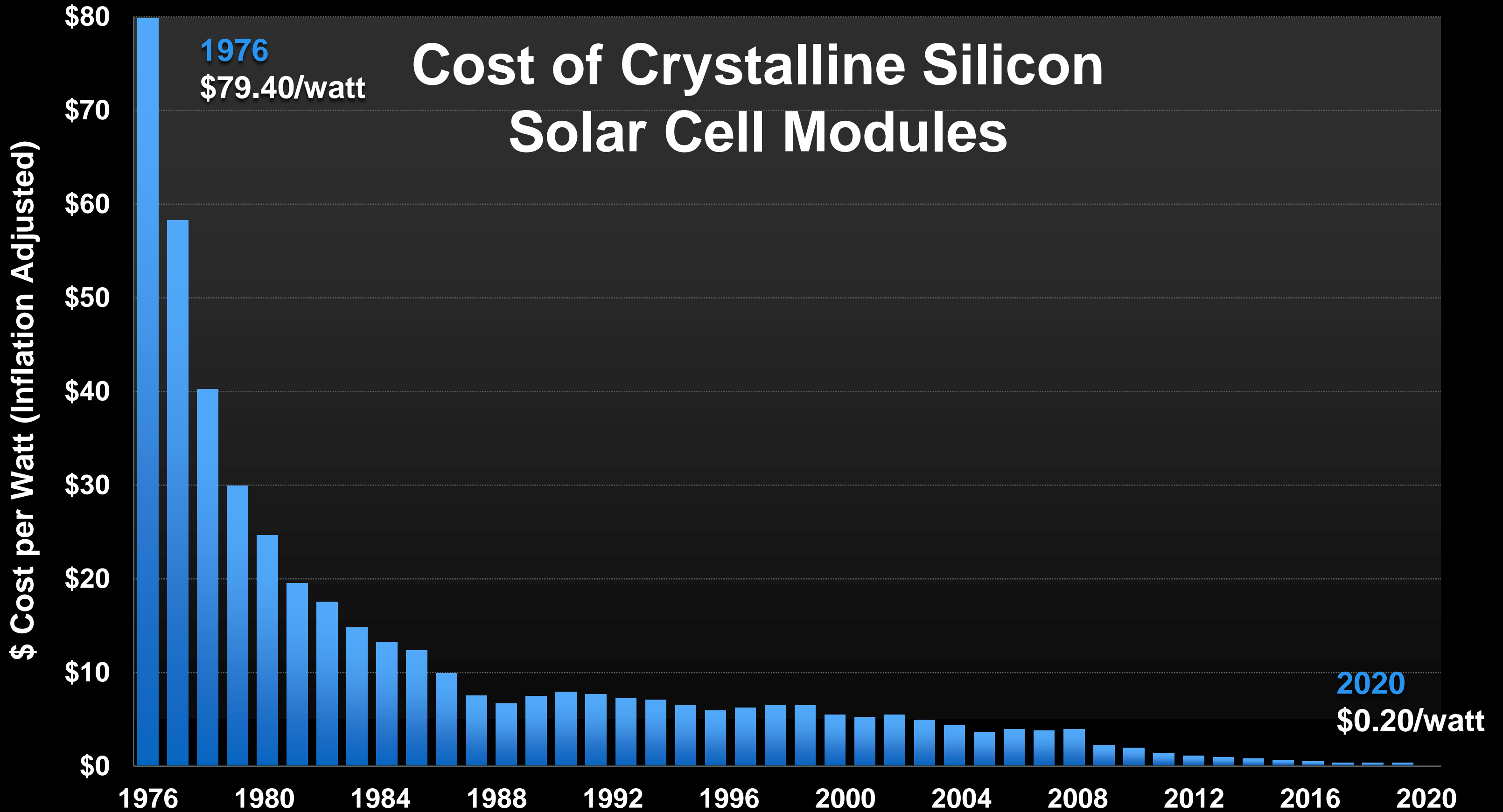


# World Solar PV Installations

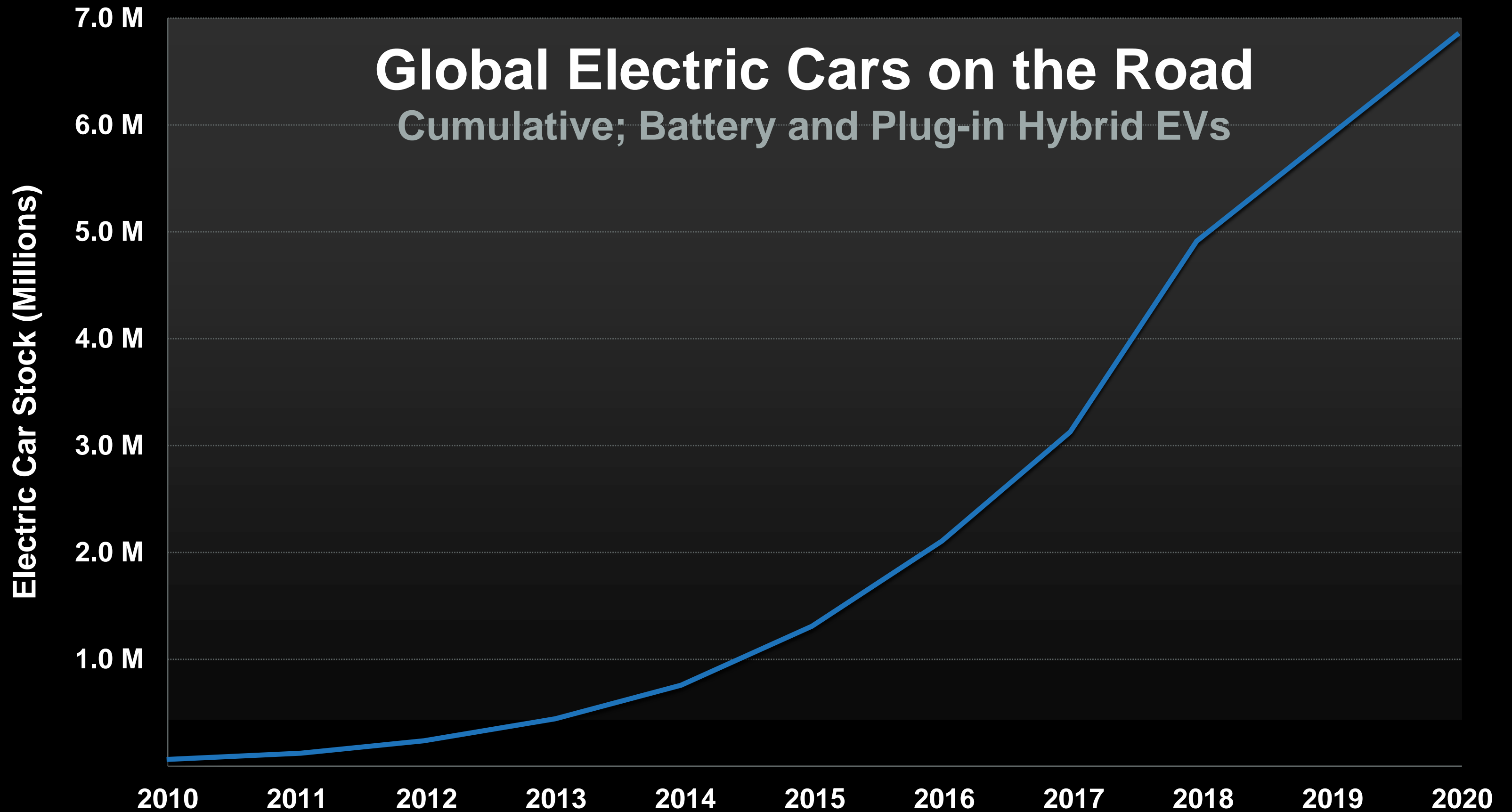
## 1980 – 2019

Gigawatts (Cumulative)









# Auto Manufacturers Are Moving to Electric Vehicles

Companies with Electric Models in Production

Aixam	Chevy	GM	Mercedes-Benz	\$mart
Aston Martin	Citroën	Goupil	Mitsubishi	Subaru
Audi	Citydom GmbH	Honda	Mullen	Tata
BAIC	CODA	Hyundai	NIO	Tesla
BMW	Daimler	JAC	Nissan	Toyota
Bolloré	Exagon	Kandi	Opel	Trumpchi
Buddy Electric	Fiat	Kantanka	Peugeot	Venturi
BYD	Fisker	Kia	Qiantu	Volkswagen
ChangAn	Ford	Kyburz	Rayttle	Zotye
Chery	Geely	Mahindra	Renault	



**HOW DO I KNOW WE WILL HAVE A  
CLEAN ENERGY FUTURE BY 2050?**

**Because the people  
demand it.**

# GLOBAL YOUTH CLIMATE STRIKE

NYC  
September 20,  
2019





# Nashville, Tennessee

September 20, 2019



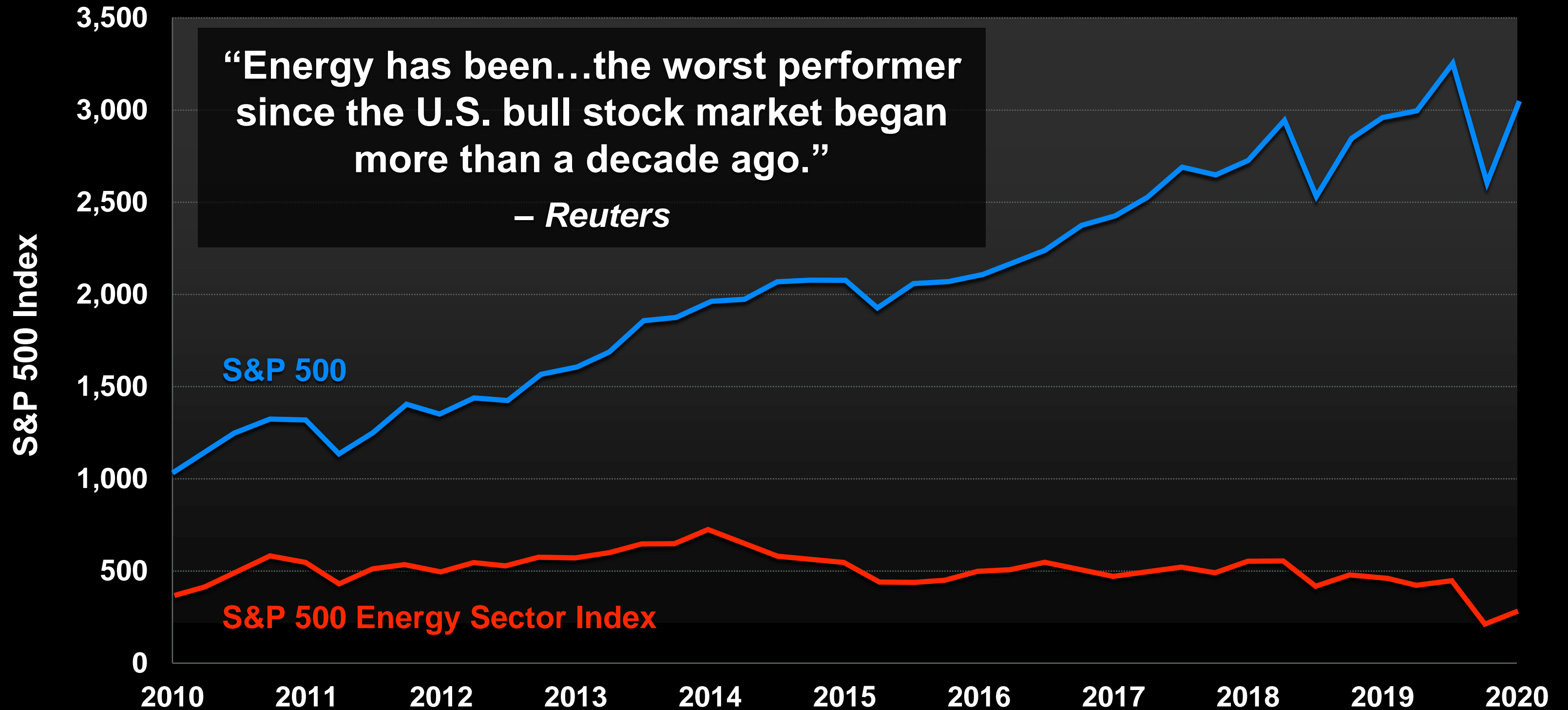


**HOW DO I KNOW WE WILL HAVE A  
CLEAN ENERGY FUTURE BY 2050?**

**And the market will drive it.**



# Conventional Energy Stocks Are the Worst Investments



# Twenty-four states representing 55% of the American people have formed the United States Climate Alliance

Founding Members	California	New York	Washington
Additional States	Connecticut	Delaware	Hawaii
	Massachusetts	Oregon	Minnesota
	Rhode Island	Vermont	Virginia
	North Carolina	Colorado	Maryland
	New Jersey	Illinois	New Mexico
	Michigan	Wisconsin	Maine
	Nevada	Pennsylvania	Montana
	<i>and Puerto Rico</i>		





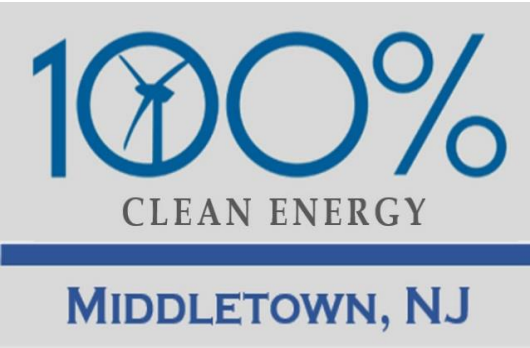
Over 240 global companies have made  
a commitment to go 100% renewable



# New Jersey's Clean Energy Initiatives

- **NJ 2019 Energy Master Plan: 100% Clean Energy by 2050**
- **Rejoin Regional Greenhouse Gas Initiative (RGGI)**
- **Join US Climate Alliance**
- **Renewable Energy Law**
  - **Renewable Energy Standard (graduated to 50% by 2030)**
  - **Solar, Offshore Wind, Energy Efficiency, Energy Storage**
  - **Energy Aggregation, Community Solar, EVs (330K by 2025; 2M by 2035)**
- **[2020 NJ Scientific Report on Climate Change](#)** (6/30/2020, NJ DEP - 205 pages)





# NJ Energy Master Plan (EMP) Strategies

- **Transportation**
- **Renewable & Distributed Energy**
- **Efficiency & Conservation**
- **Buildings**
- **Environmental Justice Communities**
- **Modernize the Grid Infrastructure**
- **Clean Energy Innovation Economy**





# Integrated Energy Plan Cost Analysis

- **Consultant: Rocky Mountain Institute**
- **Conclusion: Least cost scenario for reaching carbon neutral by 2050 would cost only a few % more than business as usual**
  - **Assumes cost of renewable stays flat (and does not fall)**
  - **Assumes price of fossil fuel stays flat (and does not rise)**
  - **Assumes no new technology**
  - **Does not count benefits of reduced emissions at all**



# NJ Top 6 Solar States: Solar Panels on 2 Million Homes





**NJ has goal of 7,500 MW from offshore wind by 2035**



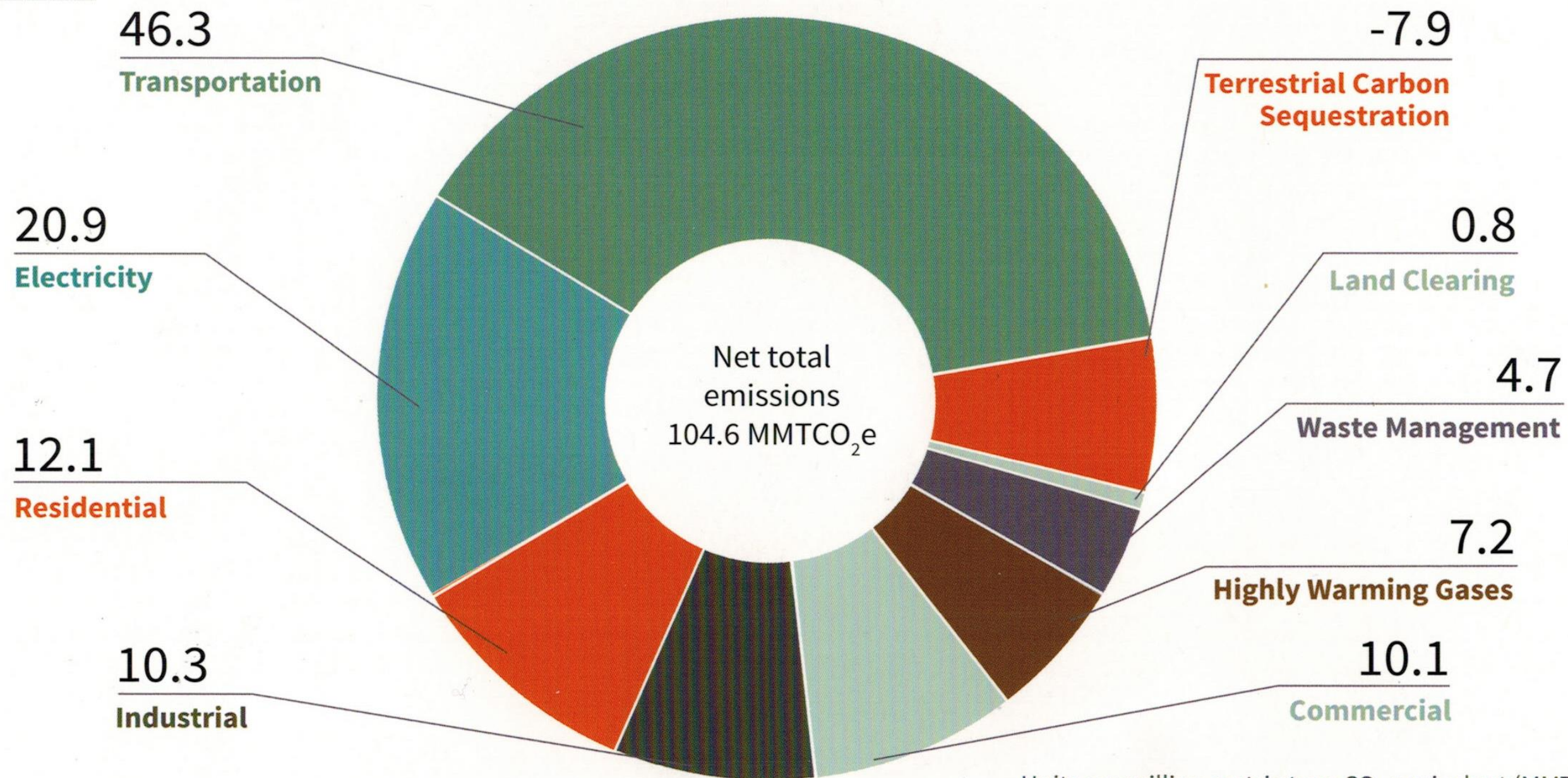


# Your (Typical NJ) GHG Emissions

“Reducing NJ Greenhouse Gas Emissions”, Rutgers, Jan 2018

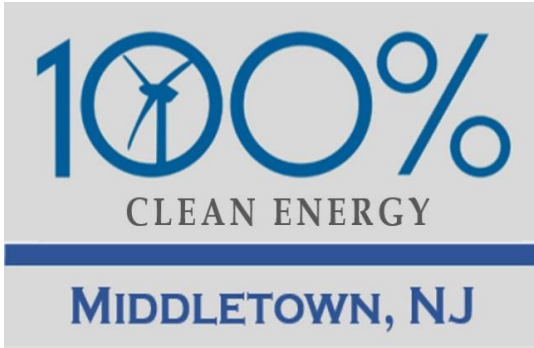
## WHAT ARE THE SOURCES OF GREENHOUSE GAS (GHG) EMISSIONS IN NEW JERSEY?

The transportation sector is the largest source of emissions in the state, followed by electricity generation and fossil fuel used in the residential, industrial and commercial sectors mainly for heating.



Units are million metric tons CO<sub>2</sub> equivalent (MMTCO<sub>2</sub>e).





# Middletown 2020 Energy Plan Goals

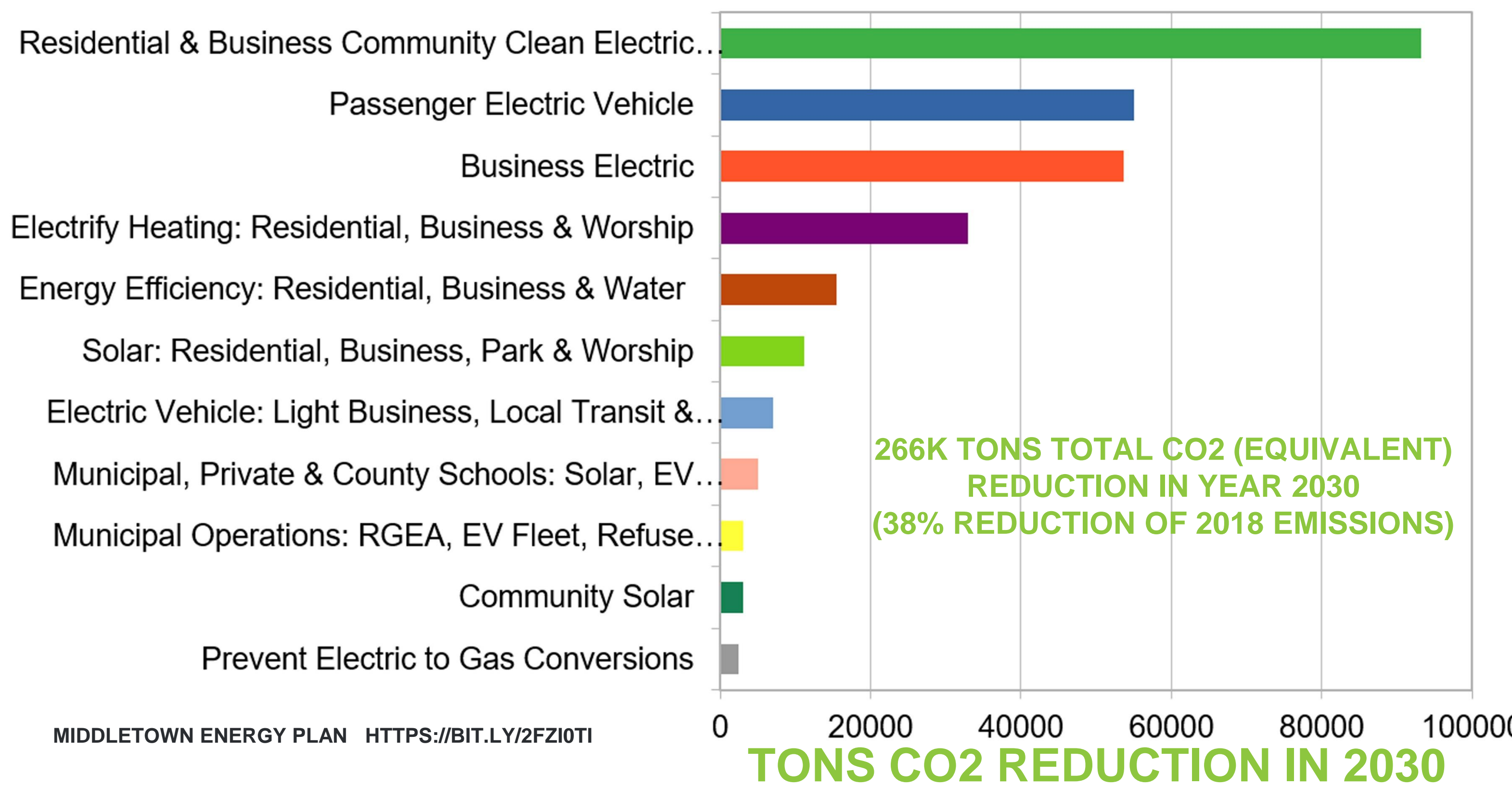
- **Make Middletown 100% clean energy by 2050**
  - As per NJ Global Warming Response Act
  - As per NJ Energy Master Plan
- **Achieve Sustainable Jersey Gold Star in Energy**





# Middletown Energy Plan: GHG emission reductions during year 2030

In 2018, Middletown emissions were 705K Tons (CO2 equiv)- calculated per capita of NJ total





# What Am I To Do?

## Switch To Clean Electricity

- **Install rooftop solar**
- **Switch to a 100% clean supplier**  
<http://electric.smiller.org>
- **Invest in or subscribe to community solar**
- **Ask your town to supply renewable community choice electrical aggregation**





# Influence Your Town To Adopt Clean Energy



FLORIDA





# New Jersey Renewable Government Energy (Electric) Aggregation (R-GEA) for Community

- **Also called Community Choice Aggregation**
- **Most effective carbon reduction action: accounts for 40% of potential savings of first decade actions**
- **Provides cost savings to residents; low or no cost to Township**





# Switch To Plug-in Electric Vehicle (EV)

- **Plug Into Your Clean Electricity**
- **Save On Fuel Costs (~30-70% more efficient)**
- **Save On Car Maintenance**

# OTHER CHANGES WE WILL SEE IN 2050

- **Building standards to require net-zero emissions, net-zero waste, net-zero water, rooftop solar (where practical)**
- **Heating and appliances all electric; no gas furnaces, hot water heaters, stoves, or dryers**
- **Electric grid upgraded for reliability and smart metering**
- **EV charging stations replace gas stations; or exchangeable batteries**
- **Diets will be more local and plant-rich, and less animal-based or factory farmed**





**Speak up, act, and vote**

**Like your world depends on it**



**Your world depends on it.**