





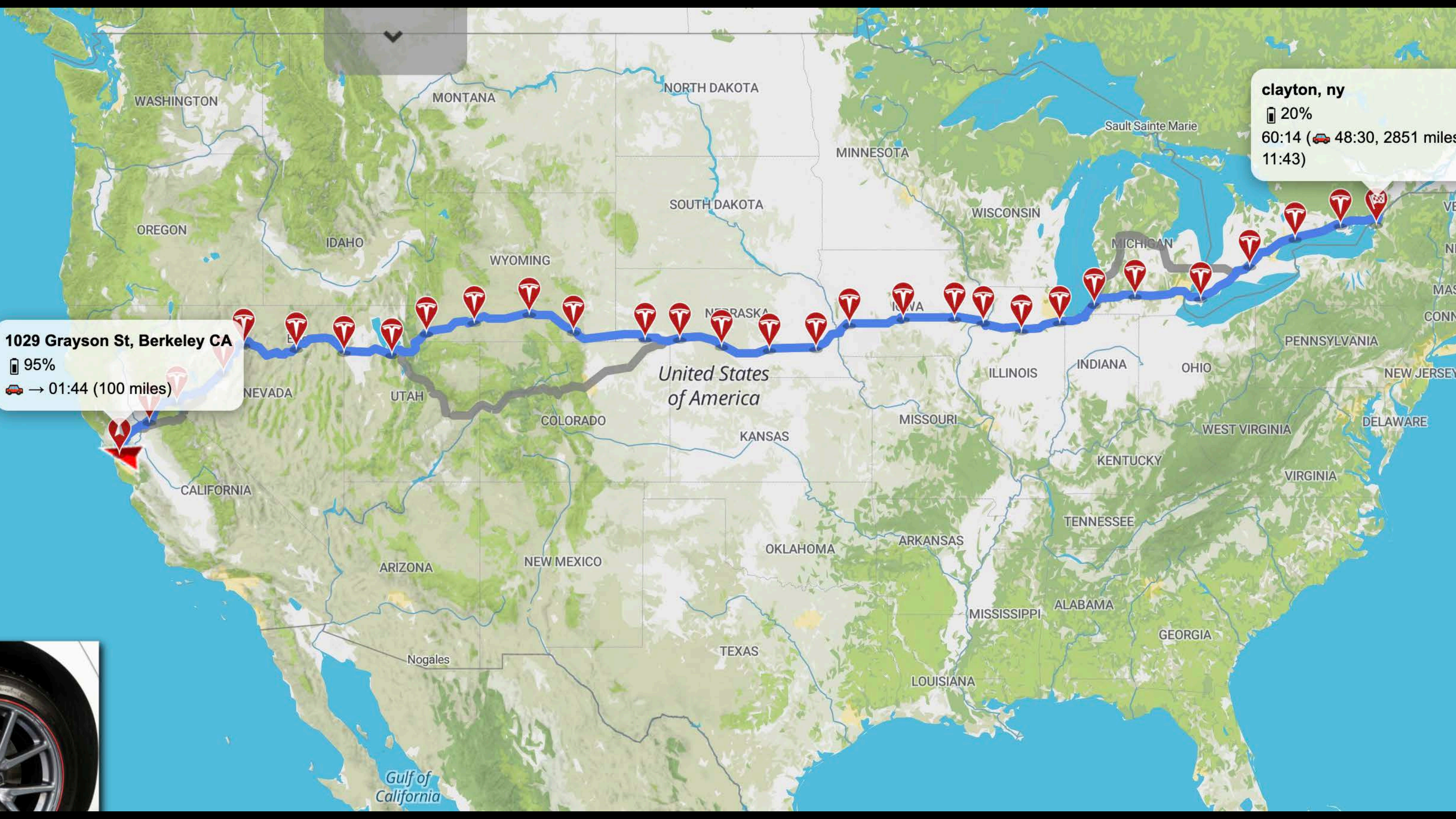
# Carter, Indiana

July, 2015

Could we travel cross country  
with an electric car?







1029 Grayson St, Berkeley CA

95%

→ 01:44 (100 miles)

clayton, ny

20%

60:14 (48:30, 2851 miles)

11:43)



# Silverthorne Colorado

June, 2015





# Nevada

June, 2015





# Bonneville Salt Flats, Utah

June, 2015





# Moab, Utah

July, 2016





# Medicine Bow, Wyoming

July, 2018

## WYOMING

### DINOSAUR GRAVEYARD



Como Bluff, Idaho from Wyoming State History

To the north lies Como Bluff—"The Dinosaur Graveyard"—one of the greatest and well known fossil beds of dinosaur remains in the world. There paleontologists of the 19th century discovered and unearthed many excellent fossil specimens of the world's largest land creatures.

Crews working for paleontologists at Yale University and the Philadelphia Academy of Natural Sciences found a multitude of dinosaur and other prehistoric animal remains in the late 1870s and 1880s, making Como Bluff the site of one of the most important discoveries of Jurassic fossils in the world. Dinosaur fossils from this region, including the now familiar *Allosaurus*, *Stegosaurus*, *Camarasaurus*, *Diplodocus*, and *Apatosaurus* (aka. *Brontosaurus*), did more than any other discoveries to make the public conscious of dinosaurs. Fierce competition ensued between paleontologists and academic institutions resulting in what is now known as the "Dinosaur Wars." In the late 1800s, hundreds of bones of dinosaurs and many other Jurassic animals, including some of the earliest known mammals were unearthed and shipped from this area. They now reside in such institutions as the Peabody Museum of Natural History at Yale, the Smithsonian National Museum of Natural History, and the American Museum of Natural History. Fossil Cabin was constructed as a tourist attraction during the Lincoln Highway era.

Como Bluff and Fossil Cabin are listed in the National Register of Historic Places. Como Bluff is primarily on private land. Trespassing is not allowed.



## WYOMING

### ALBANY COUNTY TRAIN ROBBERIES

In remote areas of Albany County, Wyoming, passenger trains carrying mail, payroll monies, and express deliveries were tempting targets for bandits. On June 2, 1890, the Union Pacific Overland Flyer No. 1 was flagged down near Wilcox Station, east of Medicine Bow, Wyoming. Two masked men boarded the train and ordered the engineer to uncouple the passenger cars. The engine, pulling the express and mail cars, was then moved two miles further down the line, where other members of the gang were waiting. When Union Pacific express messenger Charles Woodcock refused to open the express car, the bandits dynamited the door, knocking Woodcock nearly unconscious. Unable to open the safe, the robbers set another charge, miscalculating the amount of dynamite needed. The ensuing explosion not only blew open the safe, but also sides and roof of the express car. The thieves made off with approximately \$50,000.00. The Wilcox robbery was attributed to members of Butch Cassidy's Wild Bunch Gang, all but one of whom eluded capture for the crime.

One of the most famous Wyoming train bandits is Bill Carlisle. In 1916, Carlisle was sentenced to life in prison for robbing three Union Pacific trains. Three years later, he escaped from the Wyoming Penitentiary. Soon after his escape, Carlisle robbed another Union Pacific train near Rock River, Wyoming. Carlisle was shot in the arm by the brakeman in the course of the robbery. He sustained a second gunshot wound at the time of his capture. Known for never robbing women, children or soldiers, Carlisle, Wyoming's "Gentleman Bandit," was returned to prison. He was paroled in 1936 and pardoned by Governor Lester Hunt in 1947. After his parole, Carlisle became a model citizen, married the nurse who treated him for his wounds, and earned his living as a successful businessman in Laramie, Wyoming.





# The Climate Reality Project®



**1. Must we change?**

**2. Can we change?**

**3. Will we change?**



**1. Must we change?**



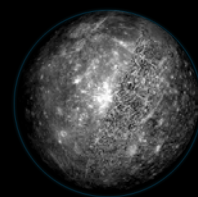






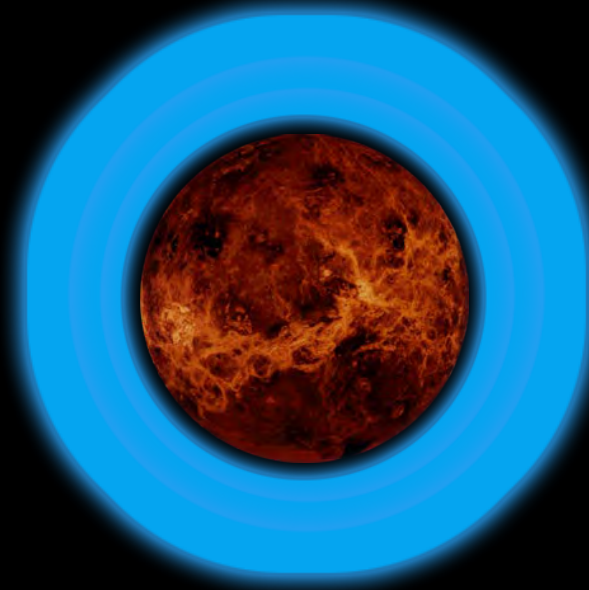
**Mercury**

**333° F**



**Venus**

**+867° F**



**Earth**

**+59° F**



**Mars**

**-85° F**







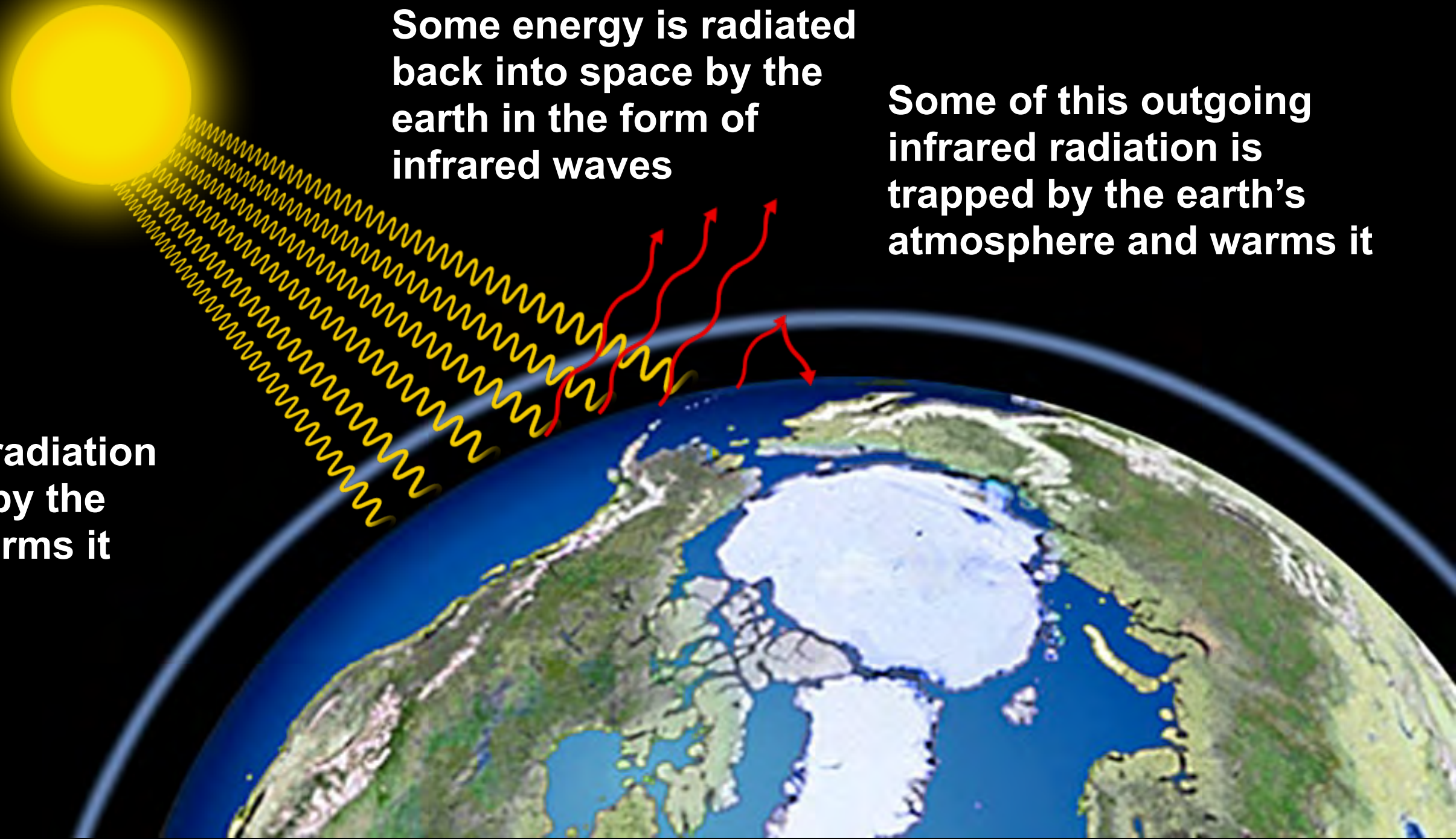


**Solar radiation  
in the form of lightwaves  
passes through the  
atmosphere**

**Some energy is radiated  
back into space by the  
earth in the form of  
infrared waves**

**Some of this outgoing  
infrared radiation is  
trapped by the earth's  
atmosphere and warms it**

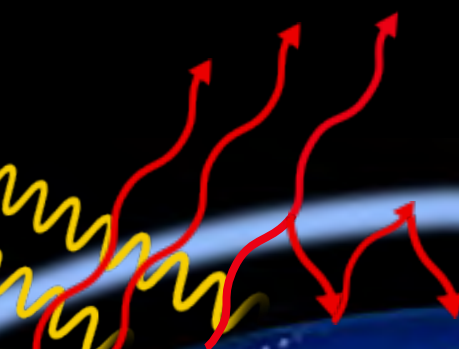
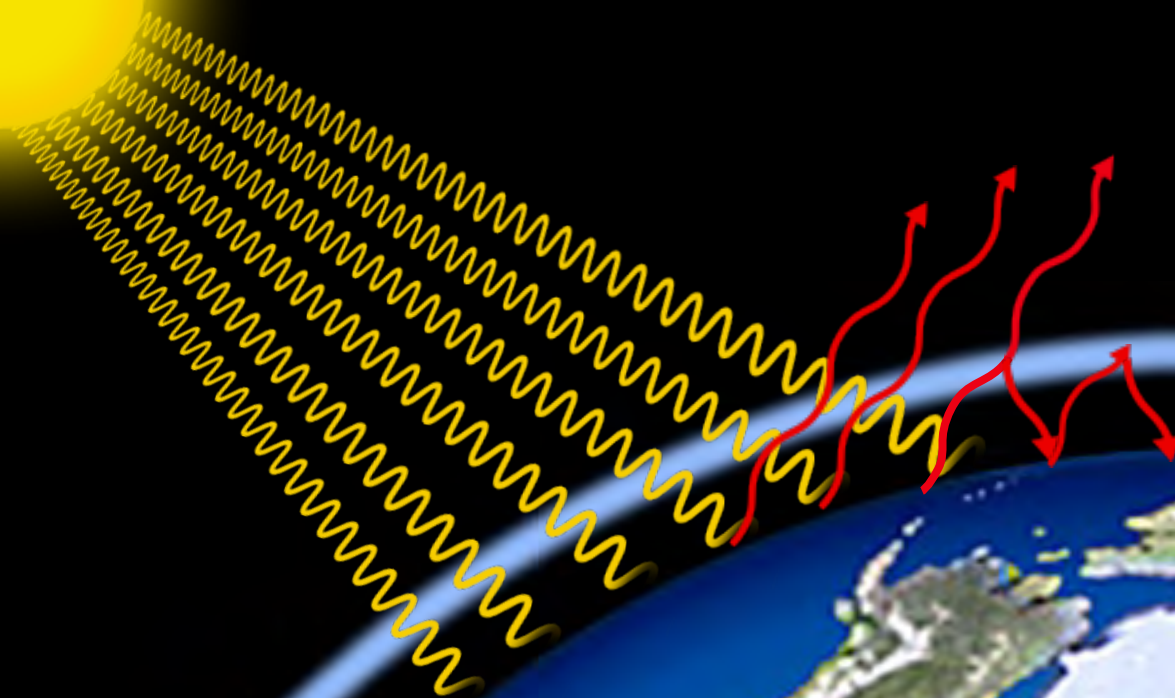
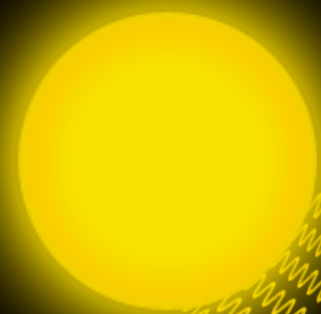
**Most of this radiation  
is absorbed by the  
Earth and warms it**





**We are now spewing 110 million tons of manmade global warming pollution into the thin shell of our atmosphere every 24 hours, as if it were an open sewer.**





**As the CO<sub>2</sub> concentration increases, more of the outgoing infrared radiation is trapped.**







THAWING PERMAFROST

COAL MINING

AIR TRANSPORT

OIL PRODUCTION

COAL PLANTS

INDUSTRIAL PROCESSES

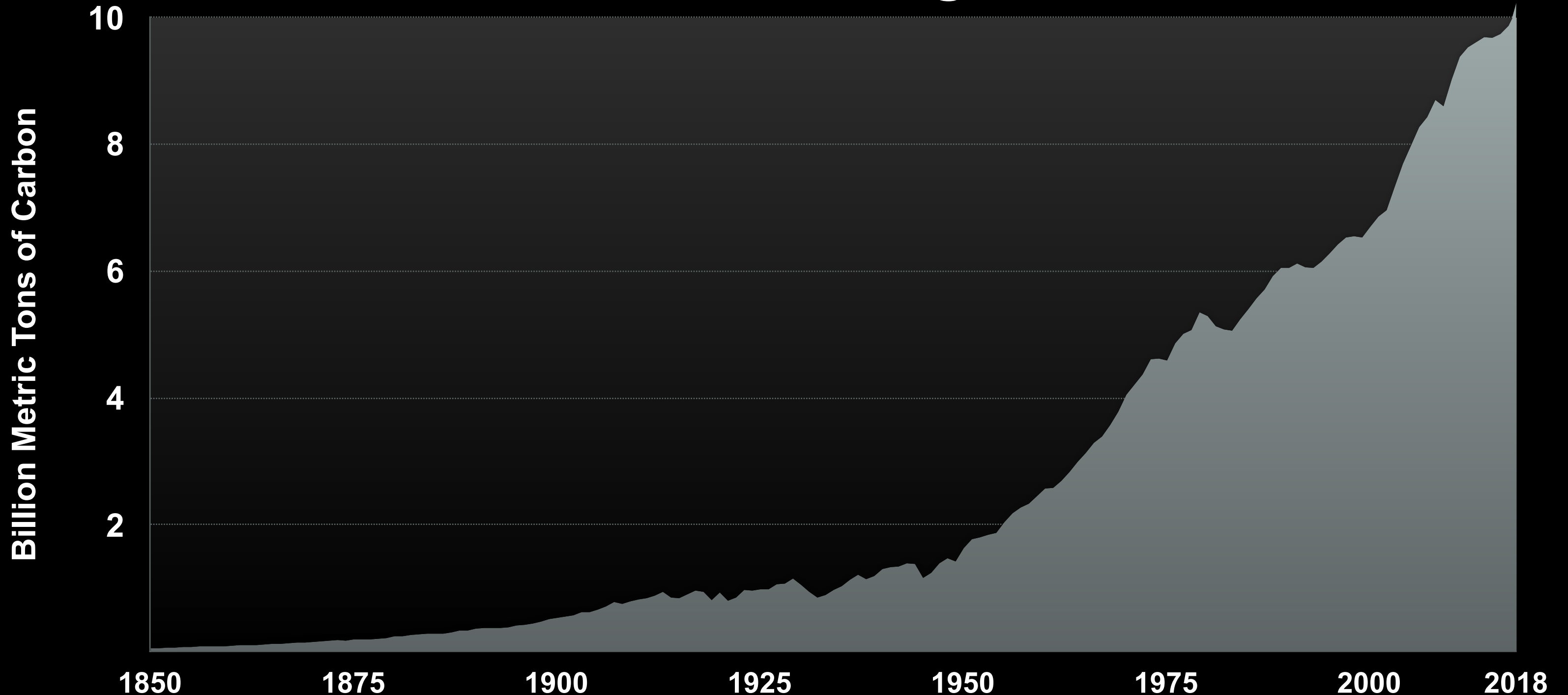
FERTILIZATION

LAND TRANSPORT

LANDFILLS

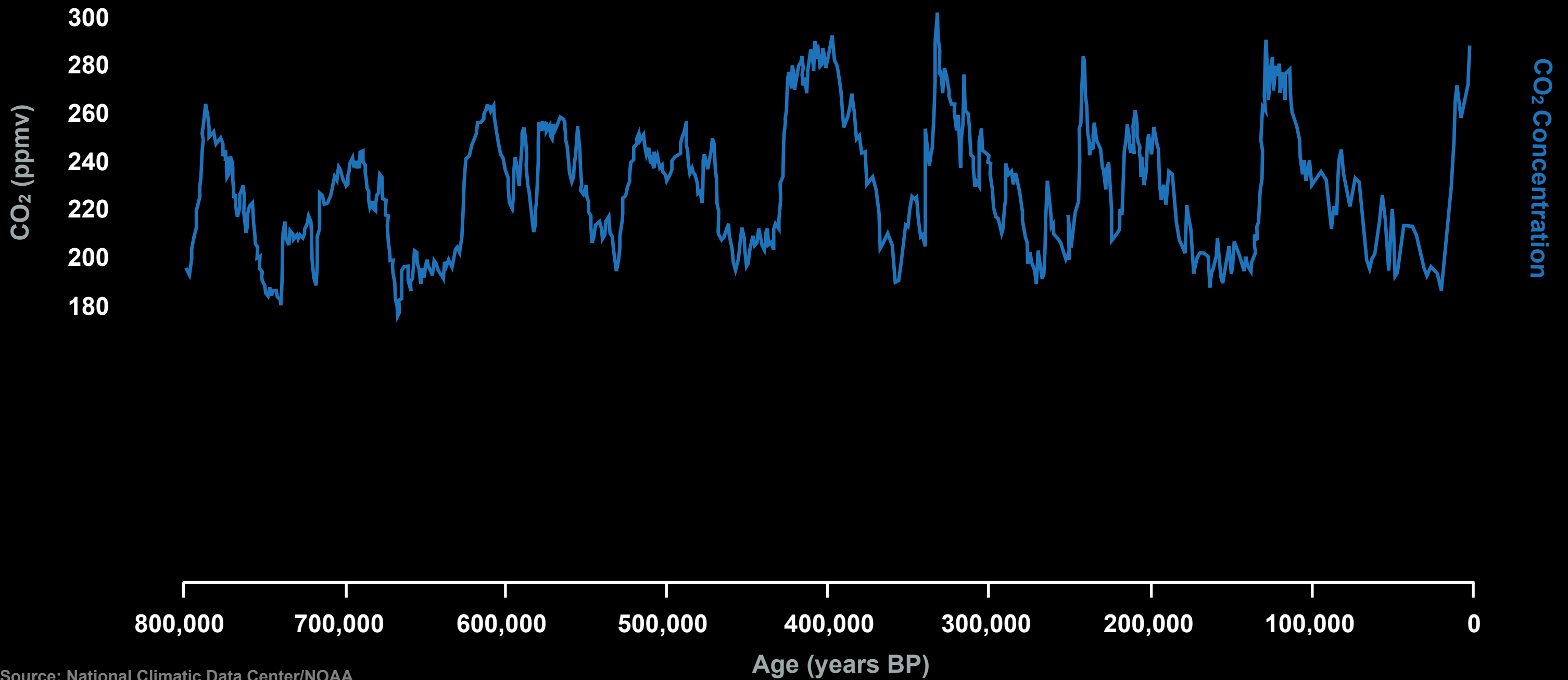


# The Largest Source of Global Warming Pollution Is the Burning of Fossil Fuels

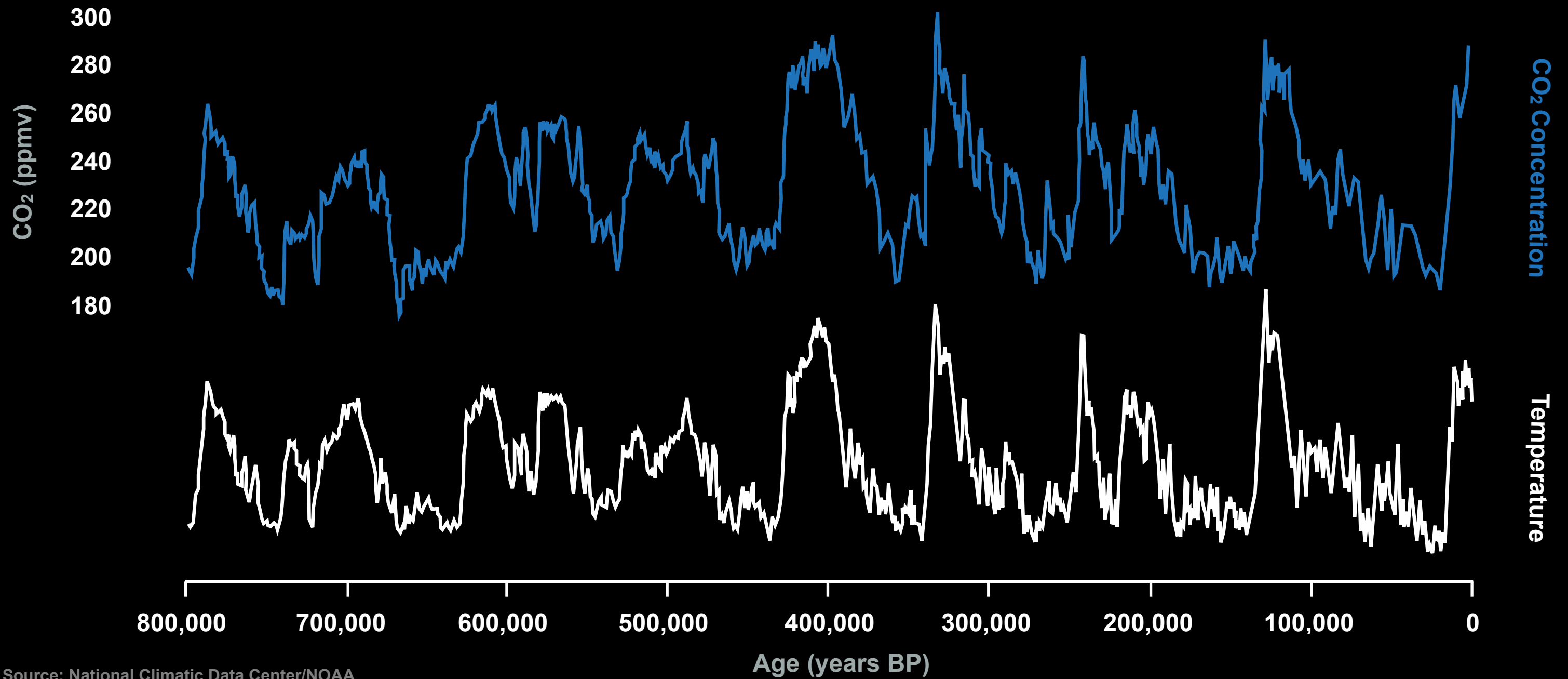


Data: U.S. Department of Energy/CDIAC

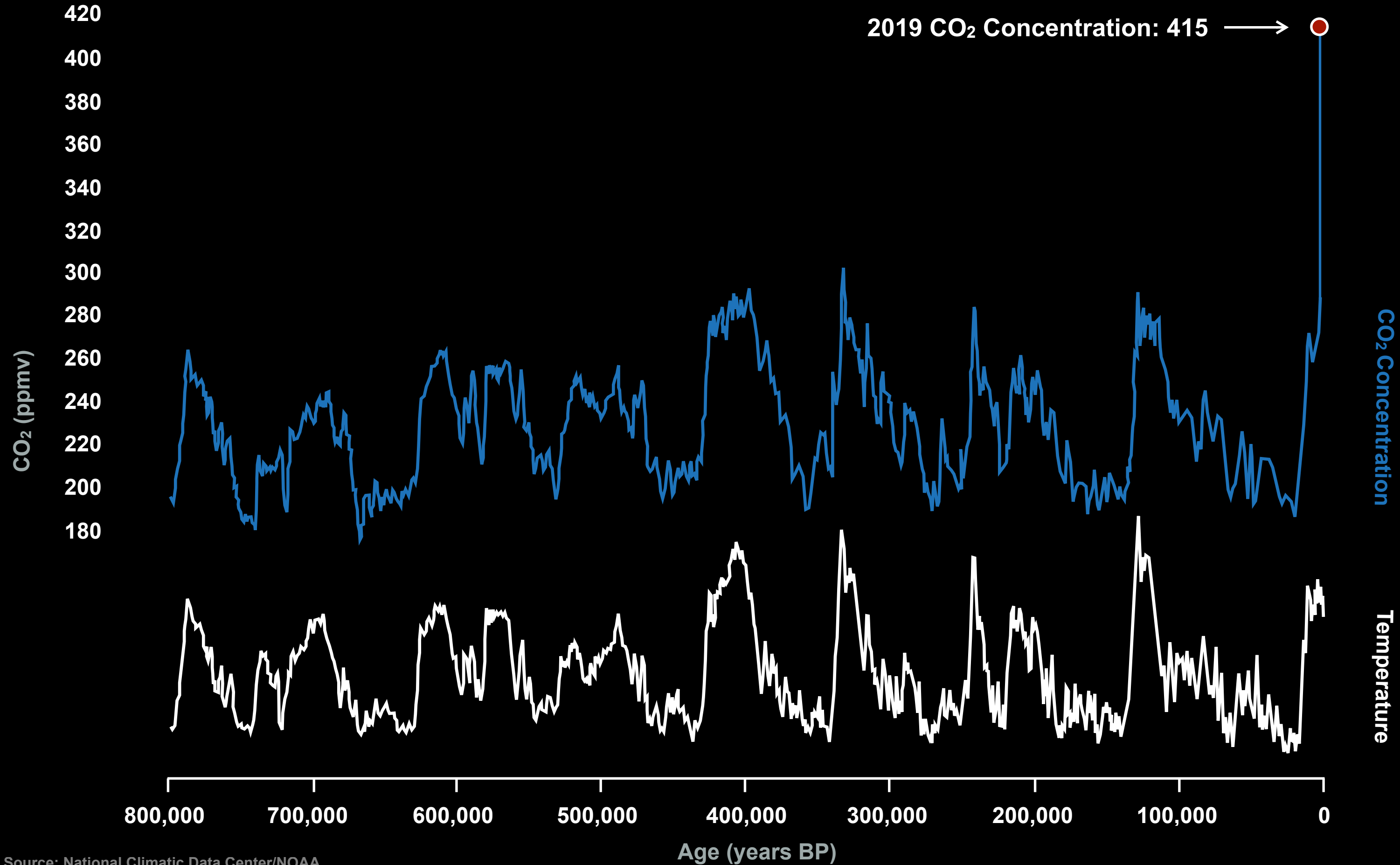




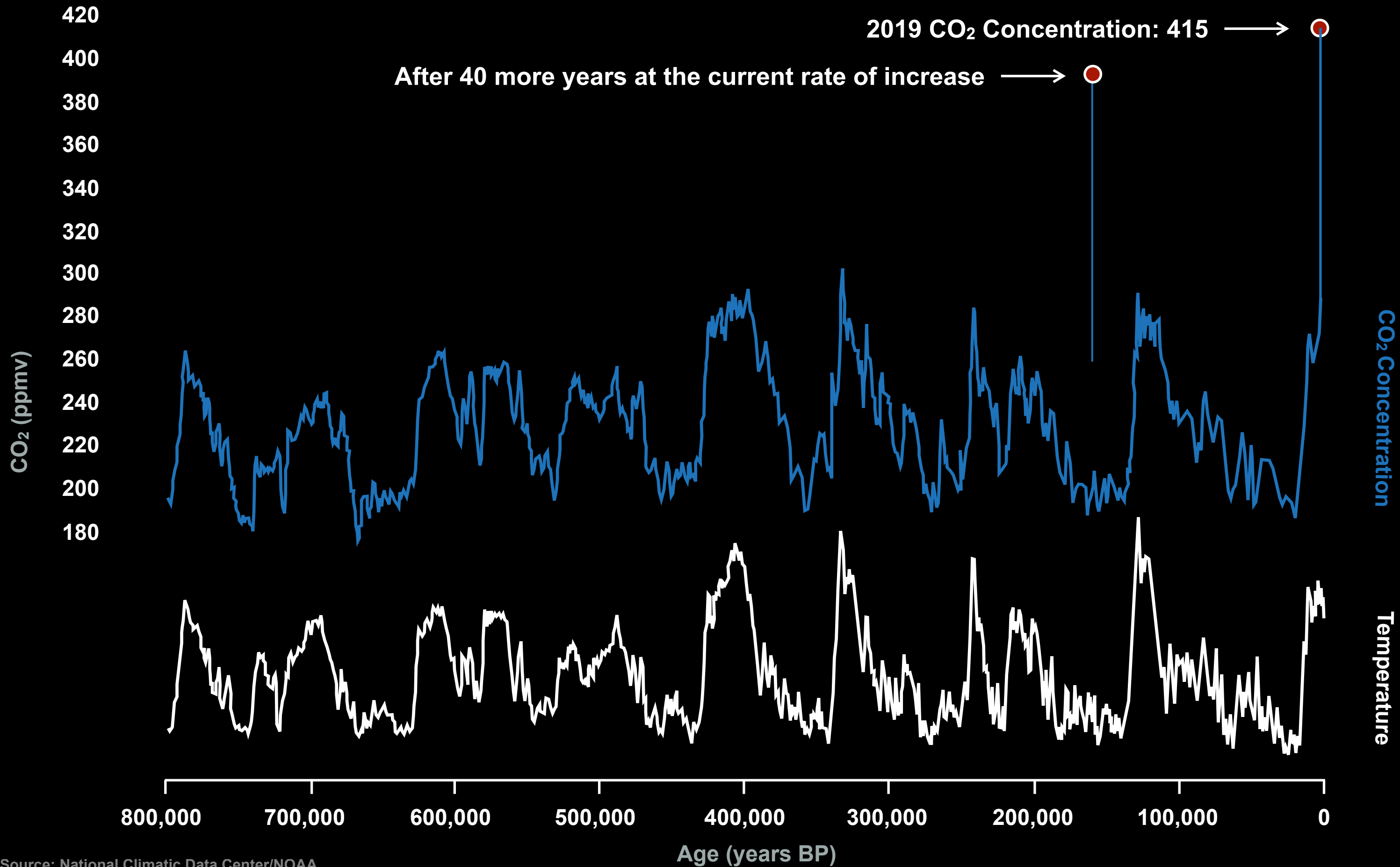








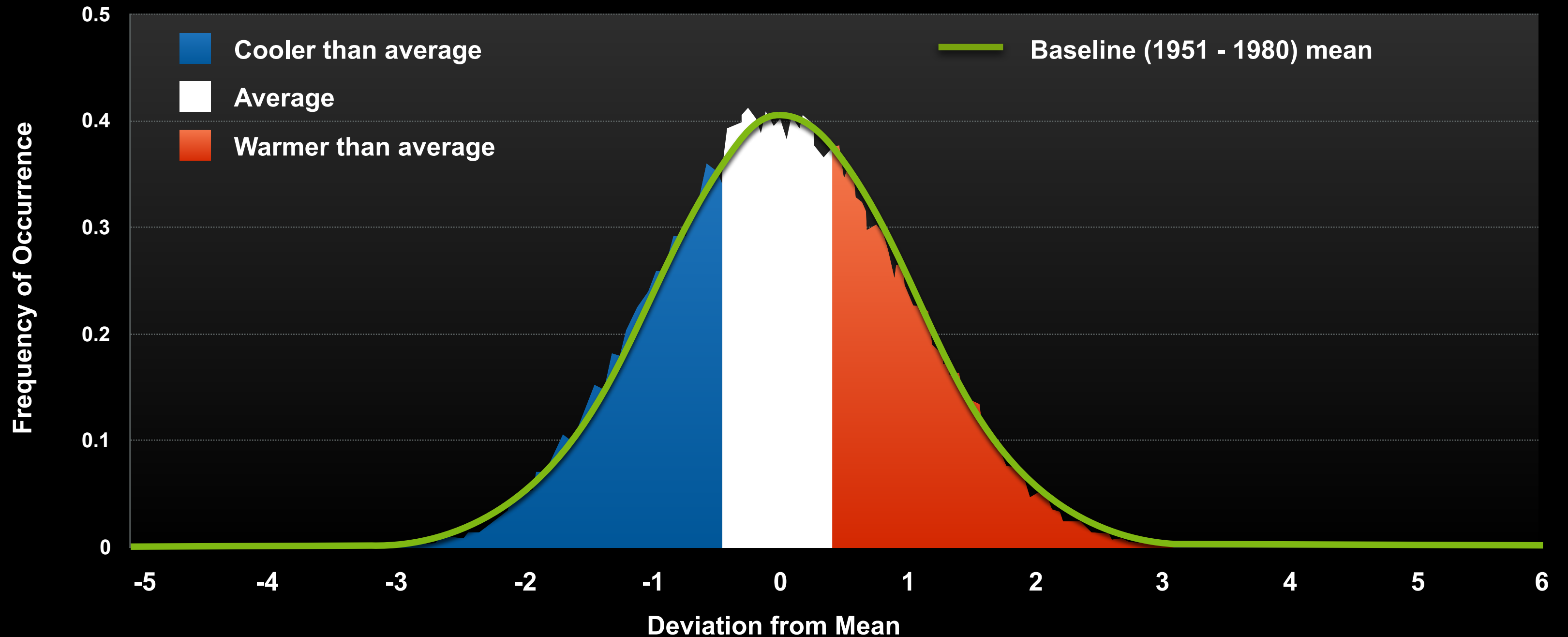






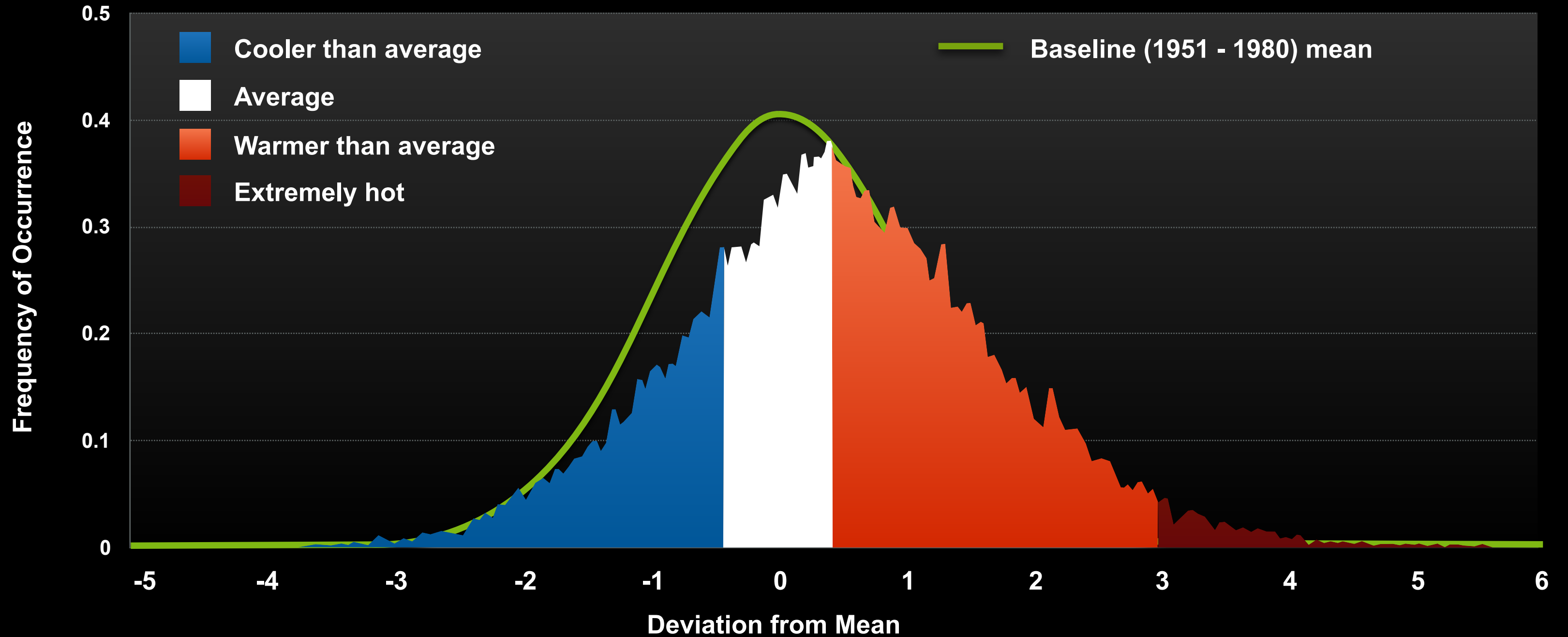
# Summer Temperatures Have Shifted

## 1951 – 1980



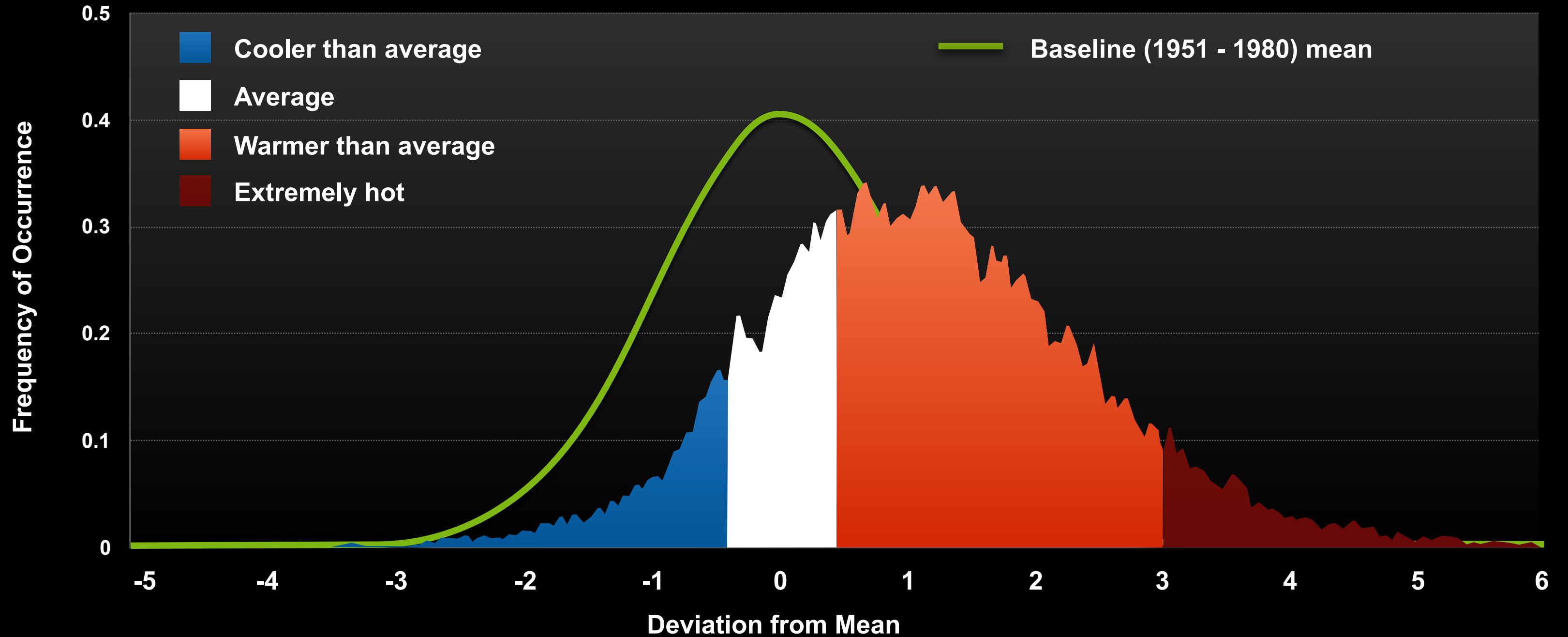


1983 – 1993



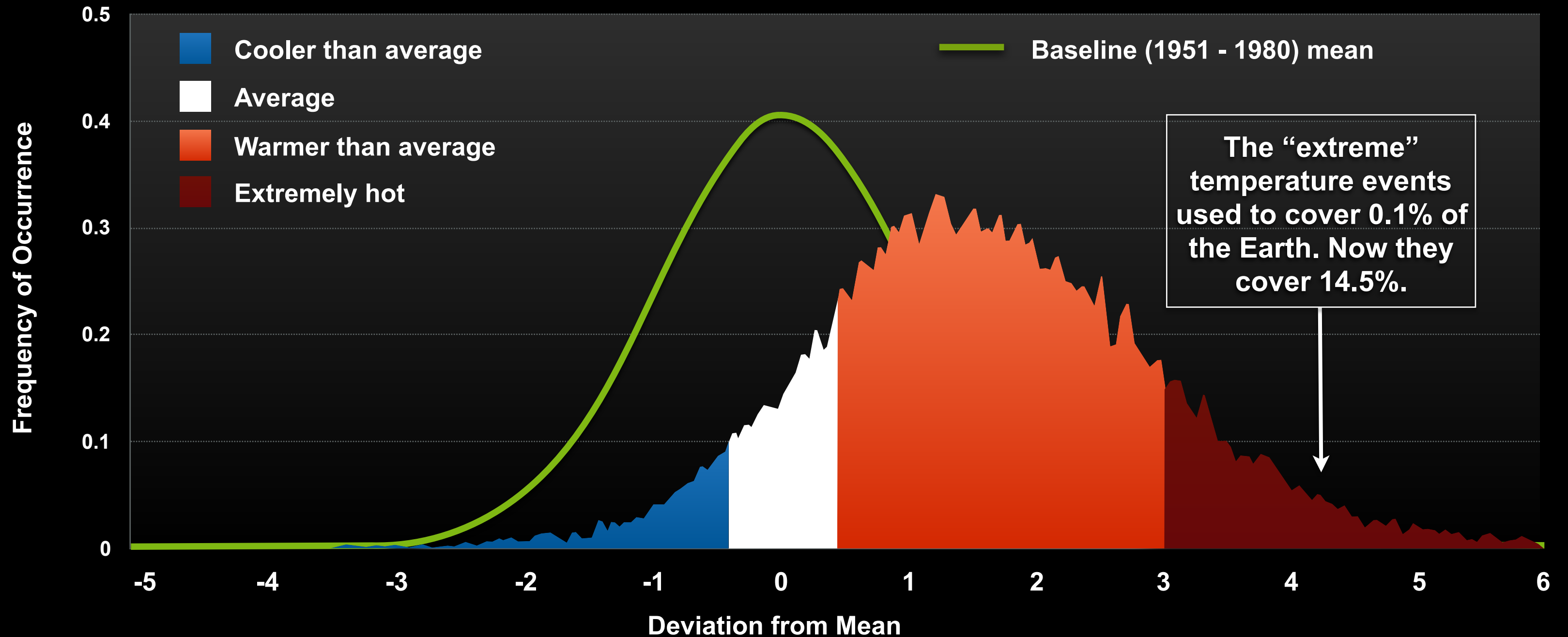


1994 – 2004





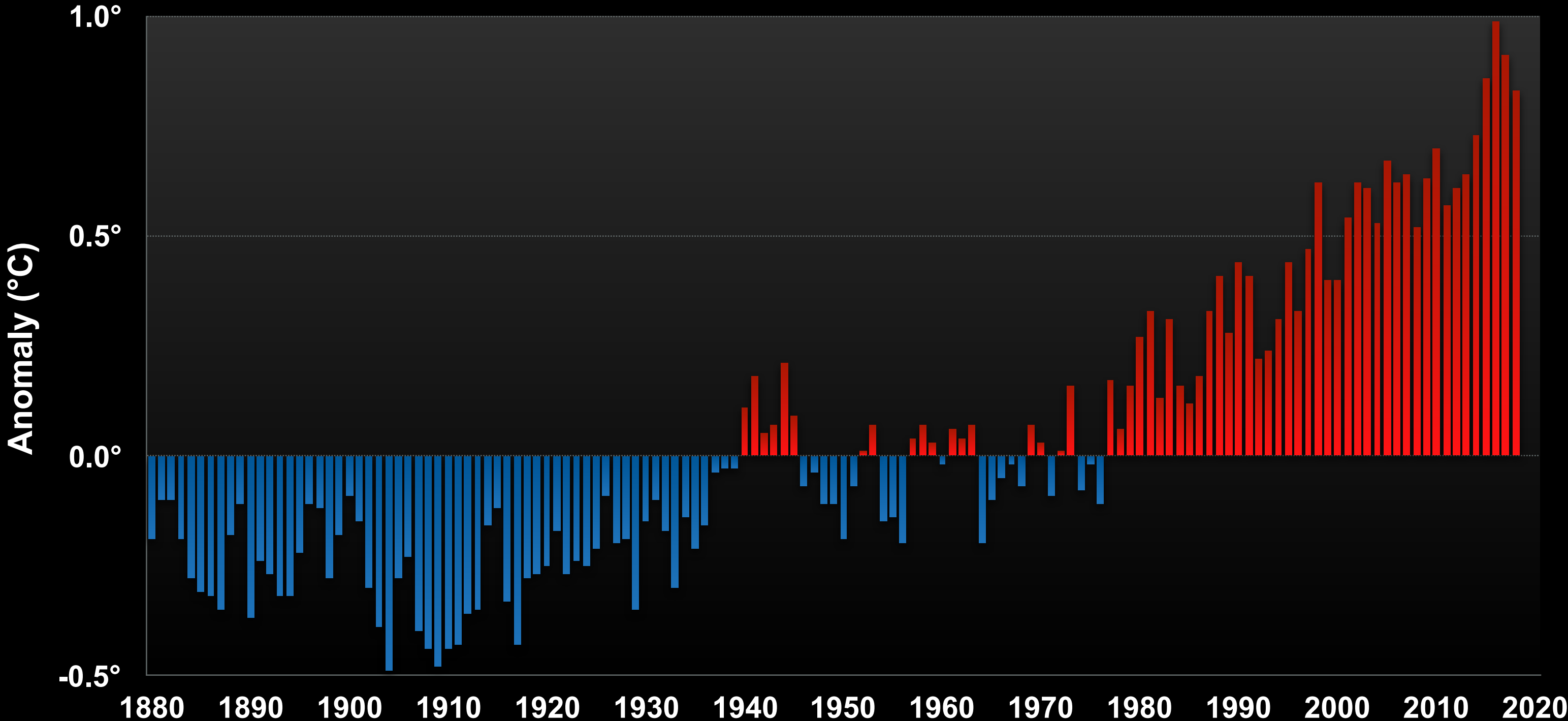
## 2005 – 2015





# Global Surface Temperature – Departure from Average

1880 – 2018



Data: National Oceanic and Atmospheric Administration



# The 8 hottest 100 hottest years have been the reason for the 5 years occurred since the year 2001

2016

2017

2015

2018

2014

2010

2005

2007

2013

2009

2012

2006

1998

2002

2003

2011

2004

2001



# Paris, France

June 28, 2019

France broke its  
all-time heat record,  
reaching **115° F** (46° C)  
on June 28th.





# Prayagraj, India

June 15, 2019

At least 36 people died as temperatures in India reached **123° F** (50.5° C) in mid-June.

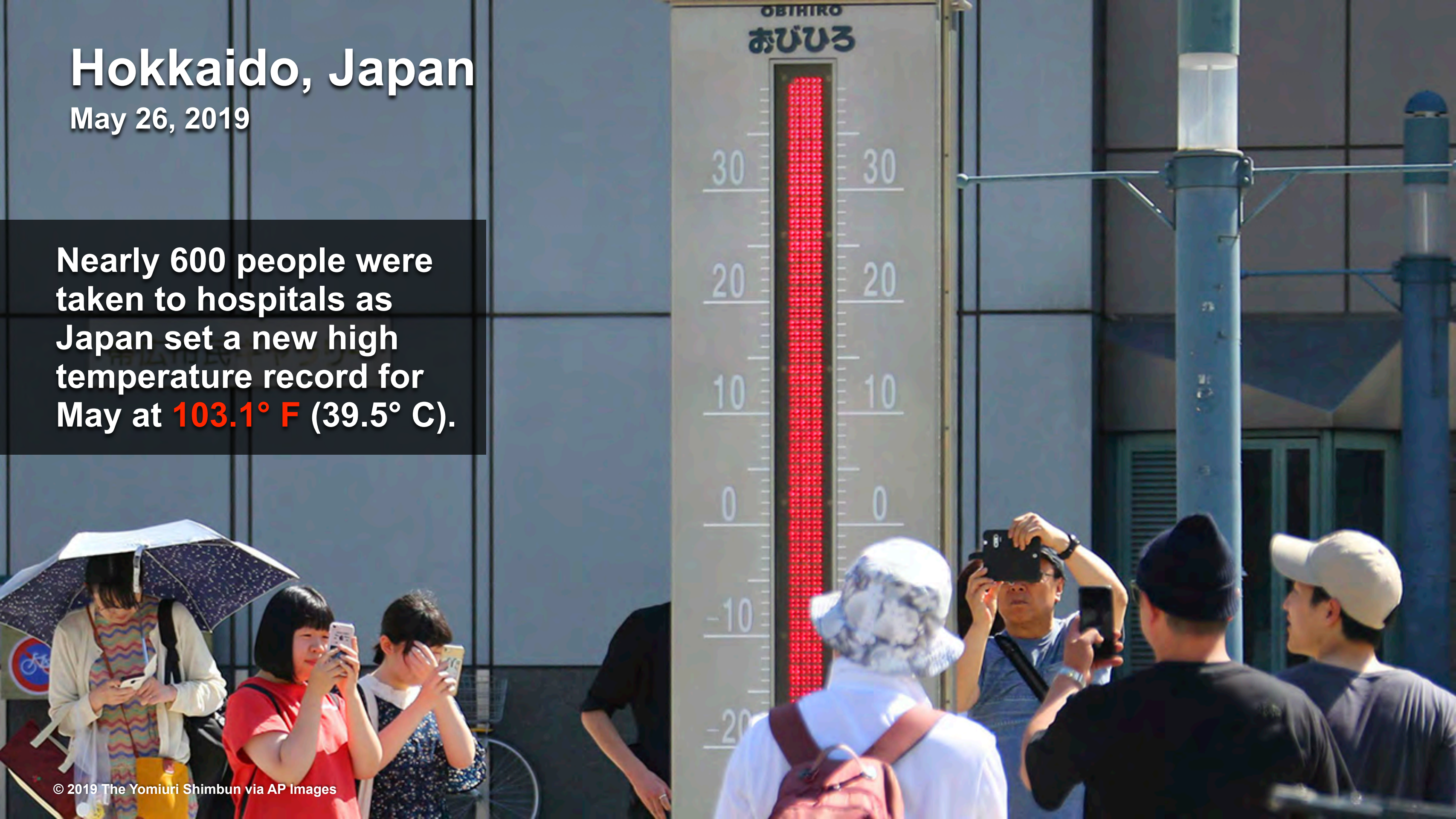




# Hokkaido, Japan

May 26, 2019

Nearly 600 people were taken to hospitals as Japan set a new high temperature record for May at **103.1° F** (39.5° C).





# Melbourne, Australia

January 25, 2019

People tried to stay cool as temperatures in parts of southern Australia reached **121° F** (49.4° C).



# Manhattan, New York

July 21, 2019

The heat index in New York City reached **110° F** (43.3° C).



# Montreal, Canada

July 5, 2018



**At least 90 people died in Quebec during the July 2018 heat wave as ambulance services were overwhelmed.**



At least **224 locations** around  
the world **set all-time heat records** in 2018.





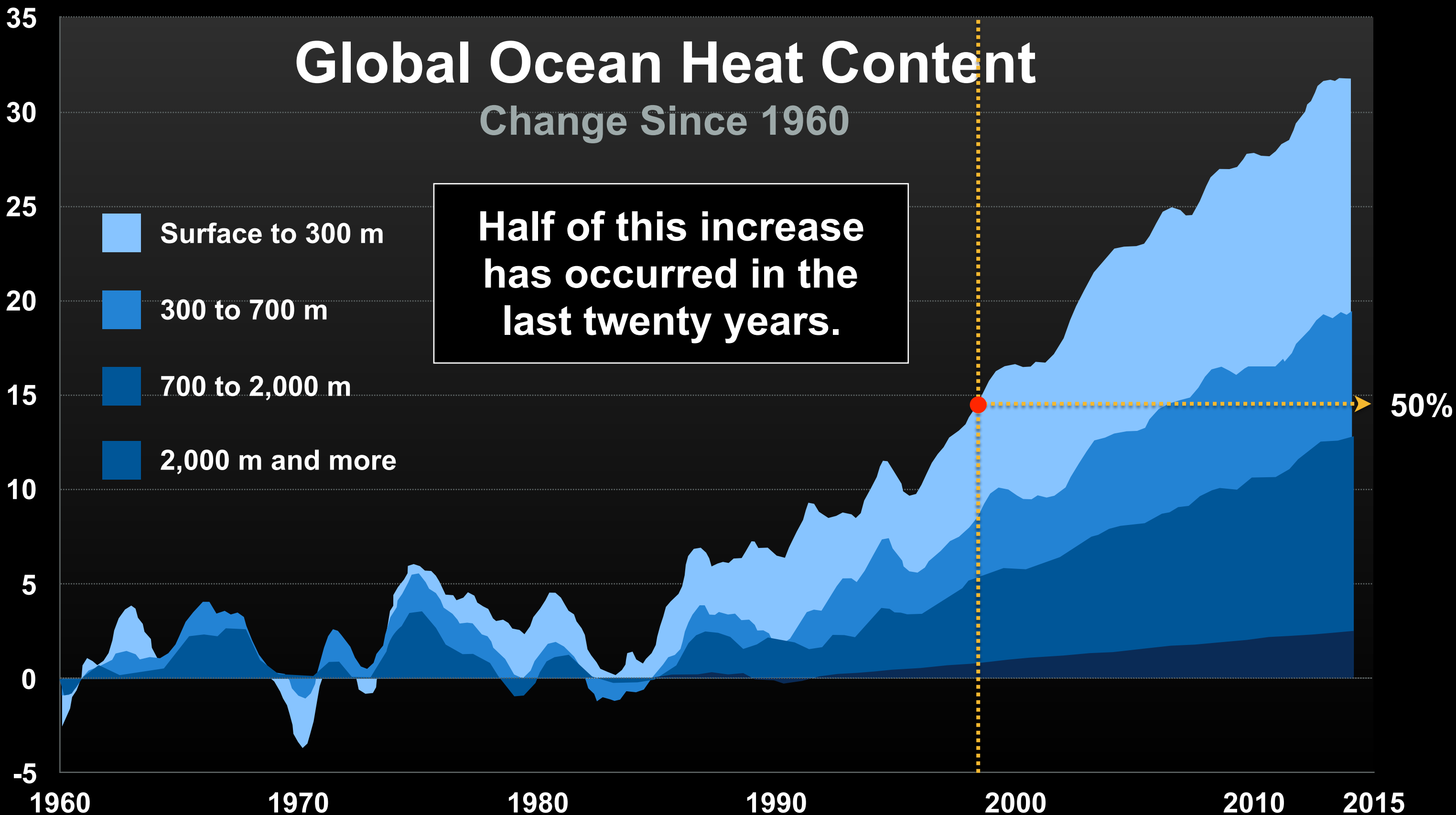
# Global Ocean Heat Content

## Change Since 1960

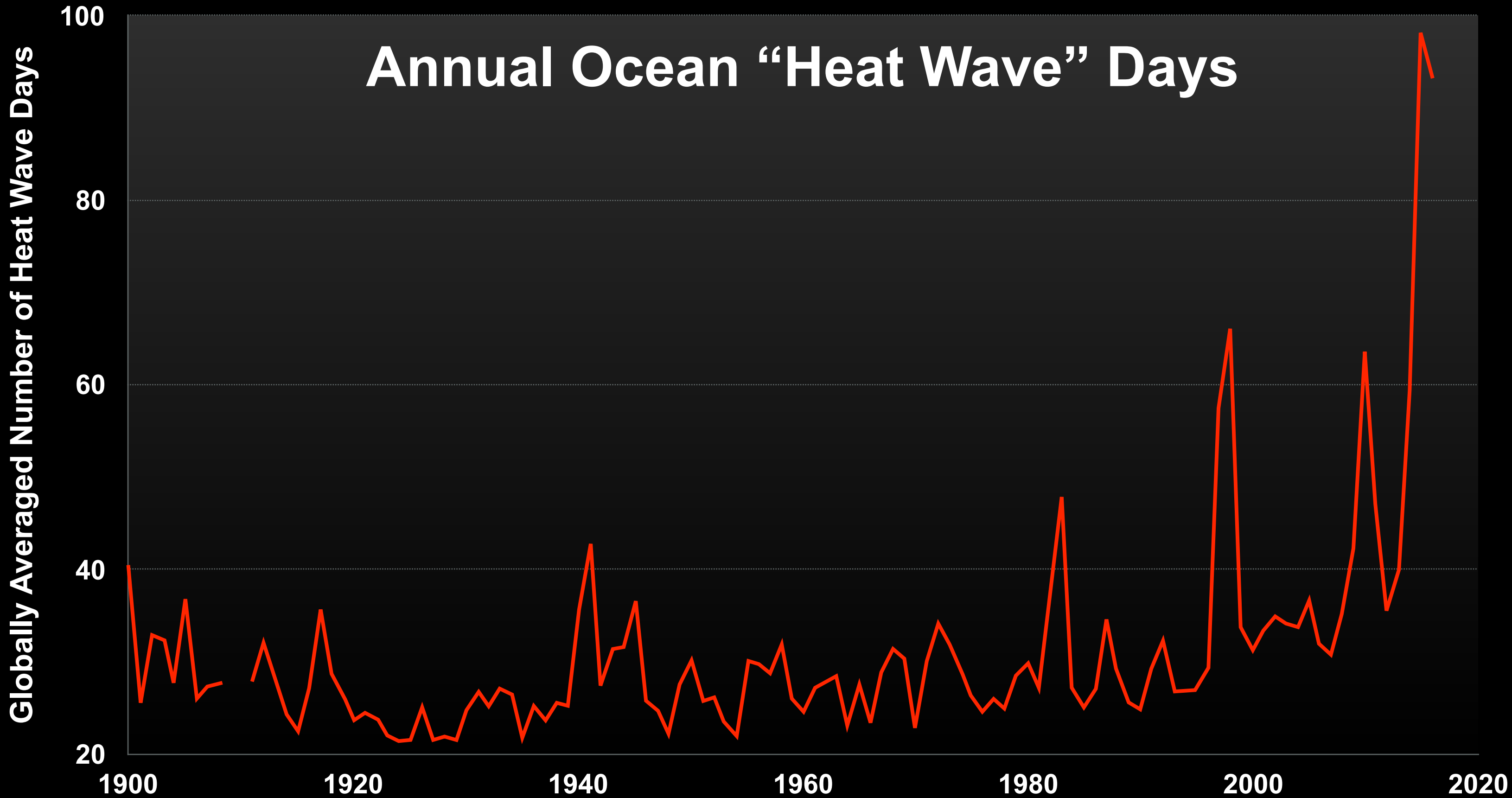
Ocean Heat Content ( $10^{22}$  J)  
0 – 2000 m Depth

- Surface to 300 m
- 300 to 700 m
- 700 to 2,000 m
- 2,000 m and more

Half of this increase  
has occurred in the  
last twenty years.





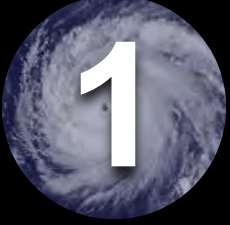


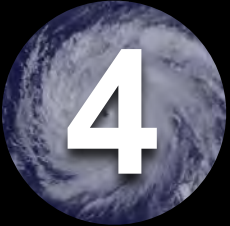
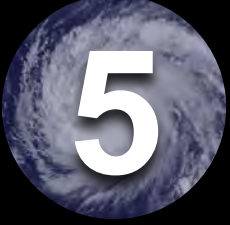


Data: Smale et al., *Nature Climate Change*, 2019. Heat Wave days per one degree (area) square of ocean.

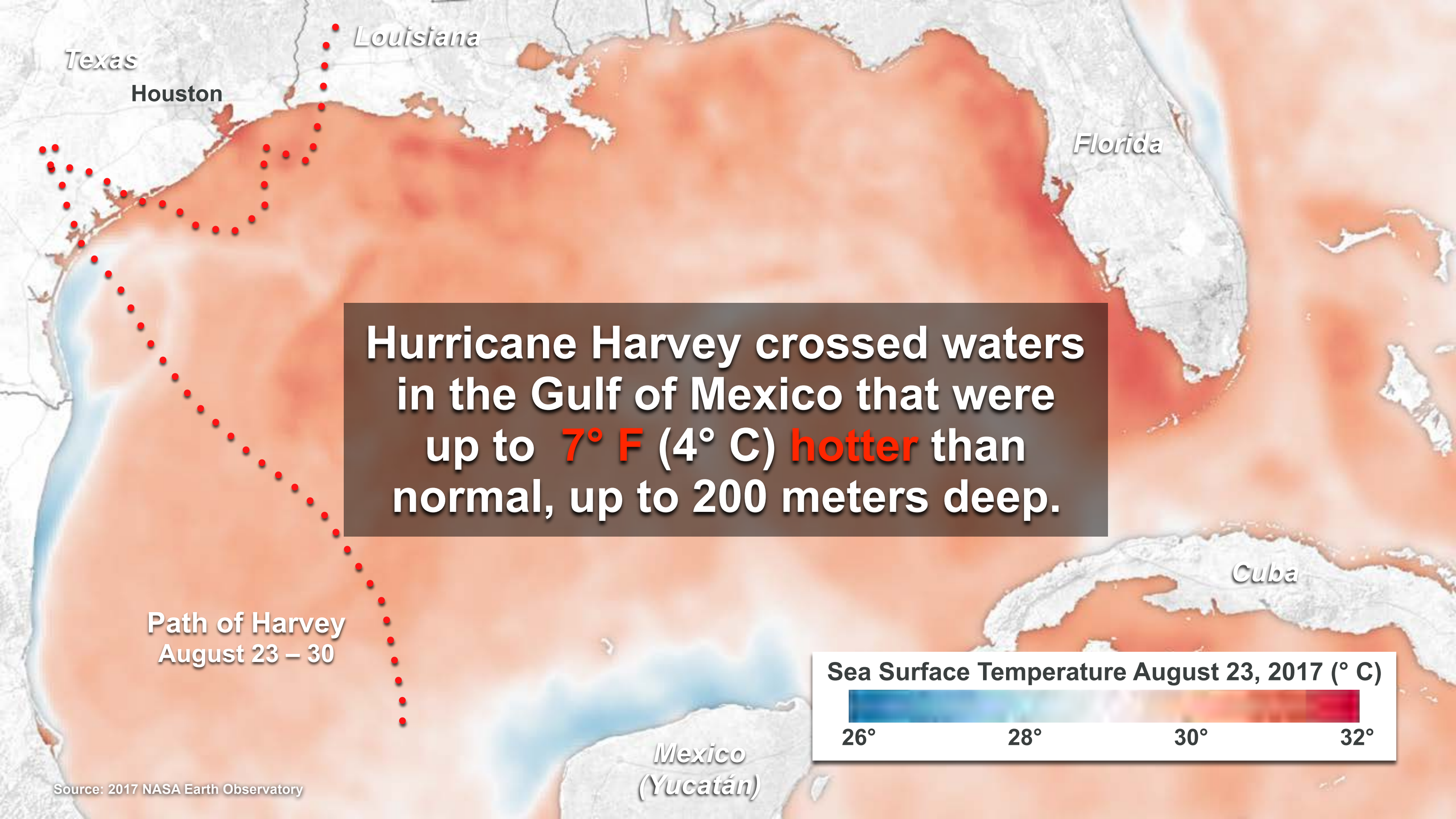


# How Does the Climate Crisis Impact Hurricanes?

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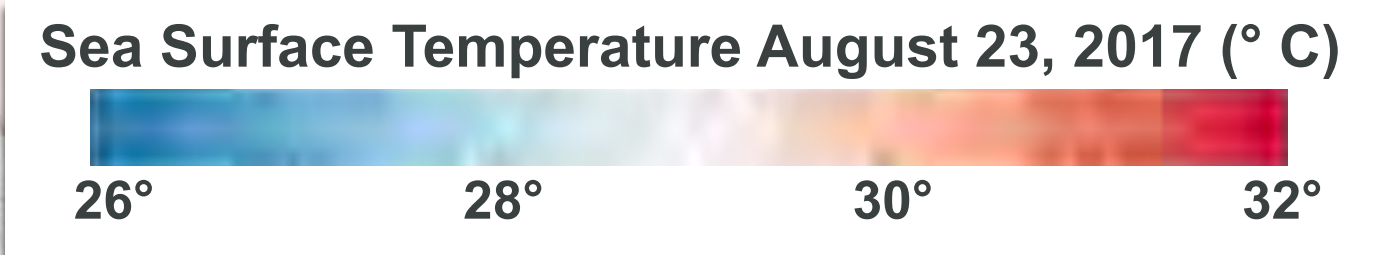
-  **1 Warmer oceans lead to more intense hurricanes**
-  **2 Hurricanes intensify much more rapidly**
-  **3 Warmer air holds more moisture, leading to heavier downpours**
-  **4 Storm surge increases due to sea level rise**
-  **5 A “wavier” jet stream can hold storms in place longer**





Hurricane Harvey crossed waters in the Gulf of Mexico that were up to **7° F (4° C) hotter** than normal, up to 200 meters deep.

Path of Harvey  
August 23 – 30





# Houston, Texas

August 27, 2017





# Houston, Texas

August 27, 2017





# Buzi, Mozambique

March 19, 2019

**Cyclone Idai has been deemed one of the worst weather-related disasters to ever hit the Southern Hemisphere.**



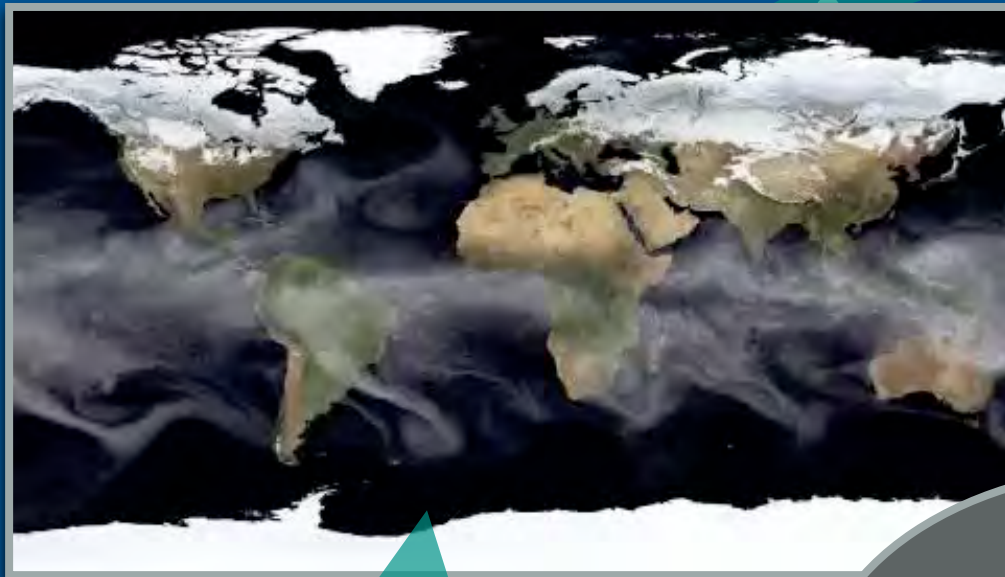
# Westville, New Jersey

June 20, 2019





**Evaporation**



**Precipitation**



**The  
Hydrological  
Cycle**



**Water Returns to the Sea**







# Phoenix, Arizona

July 18, 2016





# Tulsa, Oklahoma

May 24, 2019





# Minneapolis, Minnesota

July 16, 2019

Lyndale Av

**Intense heat fueled heavy rain and thunderstorms across much of Minnesota.**



# Irkutsk Region, Siberia, Russia

July 1, 2019



**At least 20 people died and 33,000 were affected by flooding in Siberia.**



# Kalamazoo, Michigan

June 20, 2019





# Union, Nebraska

March 23, 2019



**Nearly 1.1 million acres  
of cropland in the U.S.  
Midwest was flooded.**



# Bellevue, Nebraska

March 19, 2019

States of emergency were declared in two-thirds of Nebraska's 94 counties and in four tribal areas.



# York, England

December 28, 2015





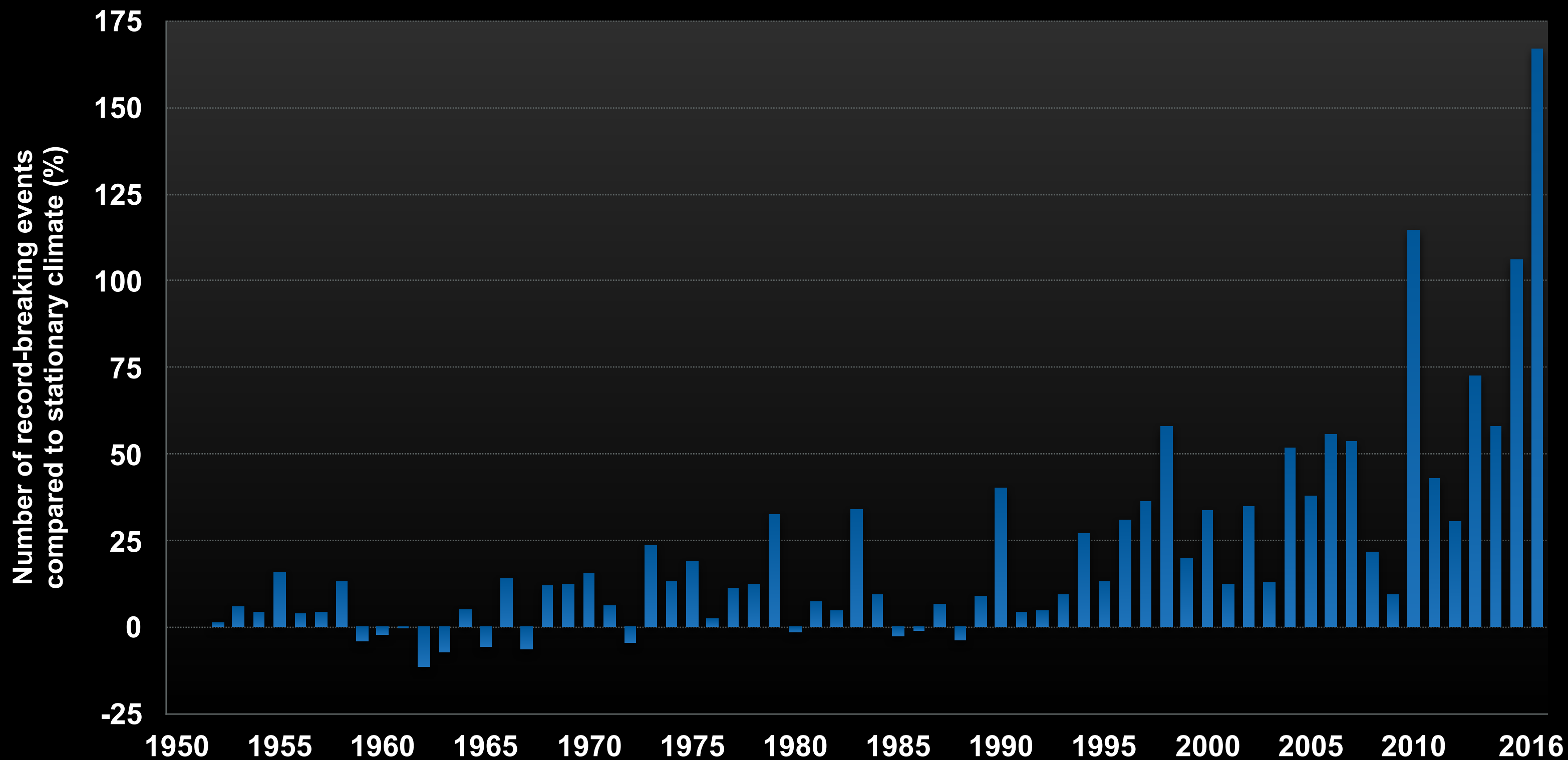
**January – May 2019 was the  
wettest such period on record for  
the contiguous United States.**



There have been  
**seventeen 1-in-1,000 year**  
downpour **events** in the U.S.  
since May of 2010



# Global Record-Breaking Precipitation Anomalies

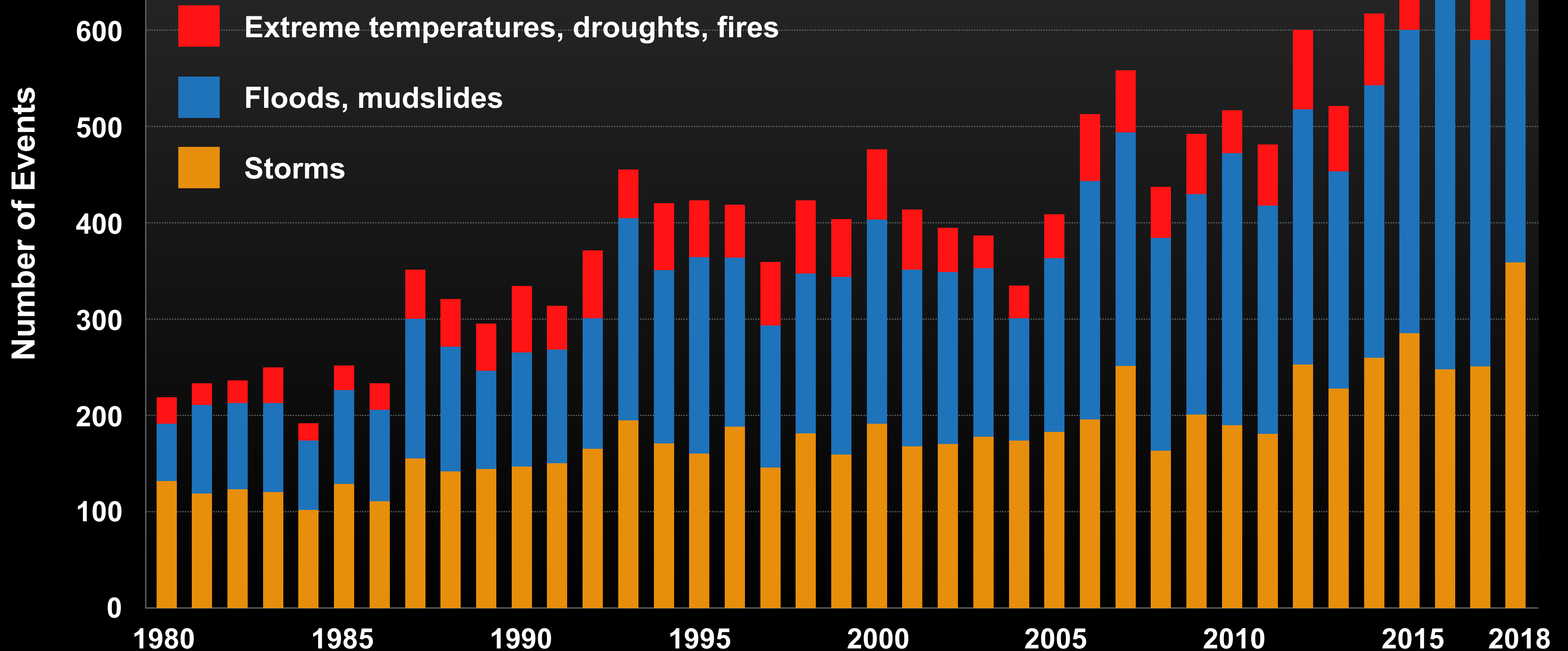


Data: Jascha Lehmann, Potsdam Institute for Climate Impact Research

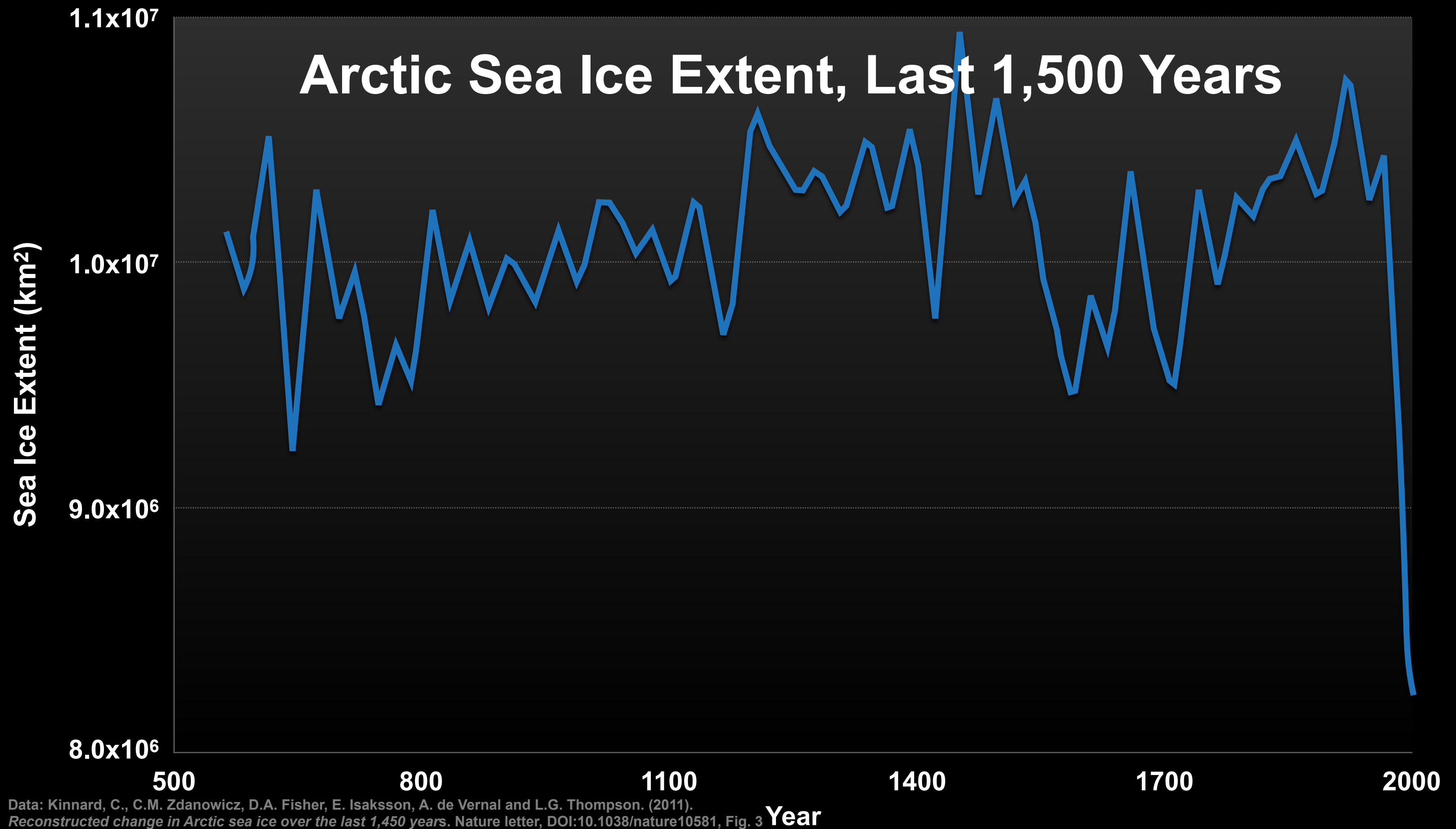


# Worldwide Extreme Weather Catastrophes

1980 – 2018









**The North Pole has now experienced  
mid-winter heatwaves three years in a row:**

**2016**

**2017**

**2018**



# Miami Beach, Florida

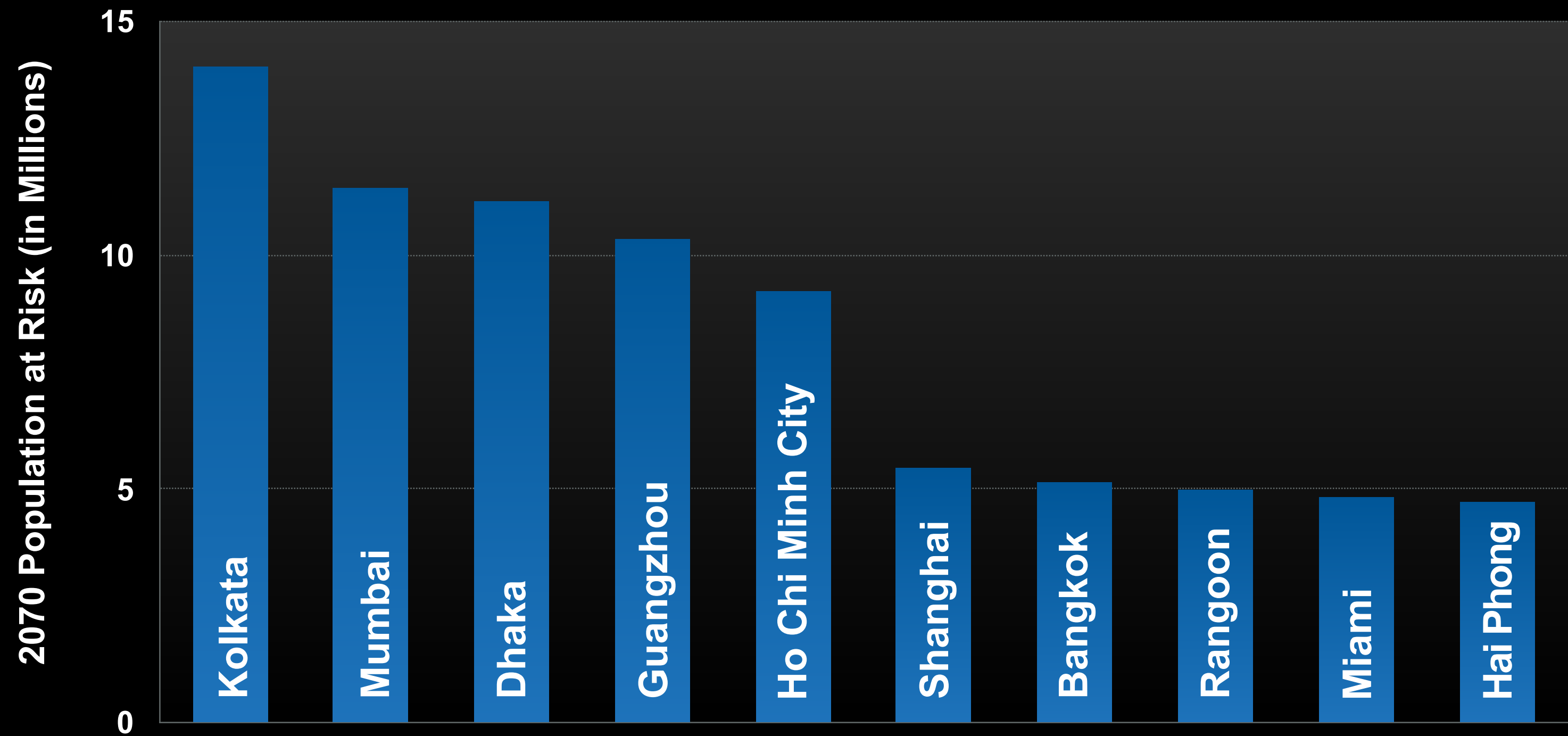
November 14, 2016





# Top 10 Cities at Risk from Sea Level Rise in 2070

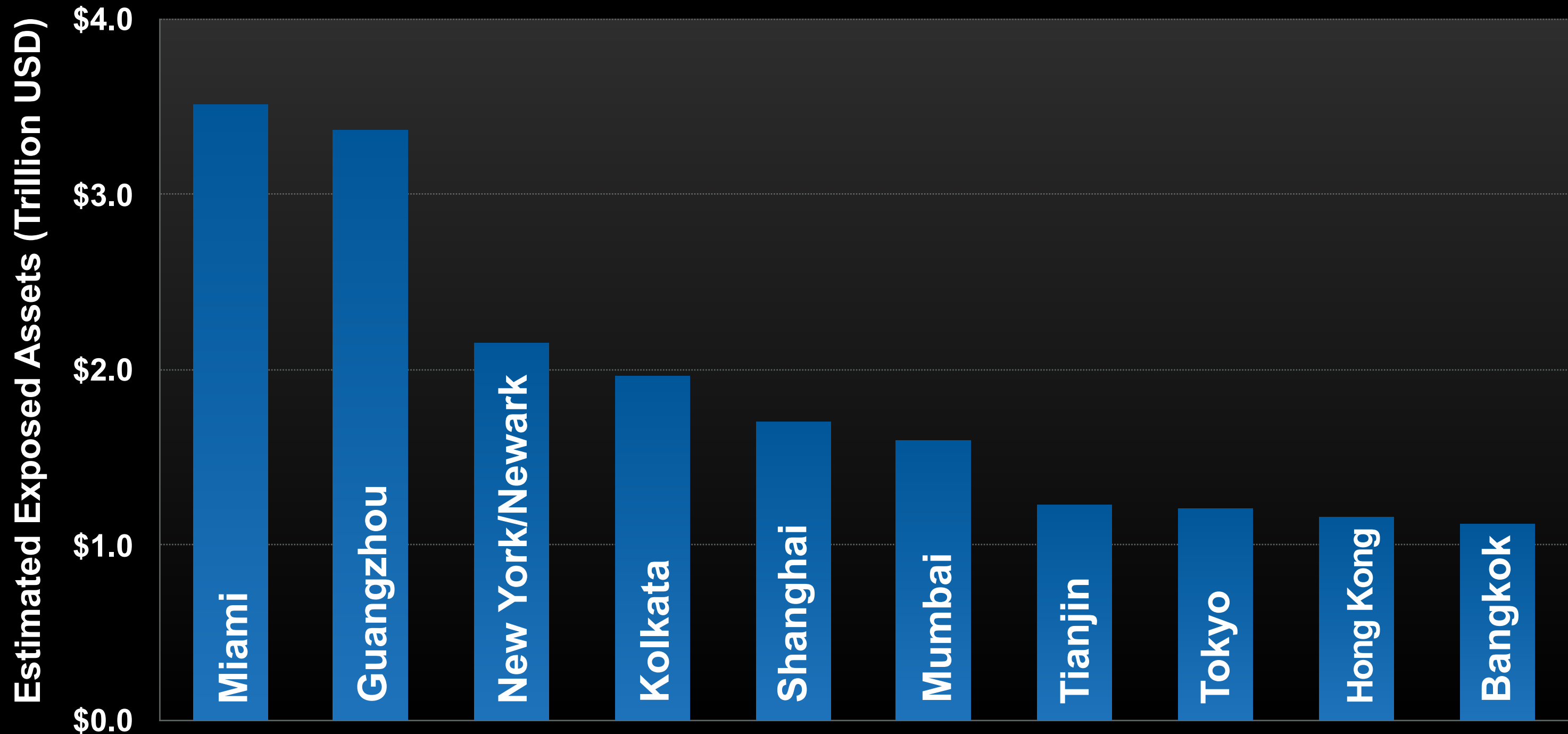
By Population at Risk





# Top 10 Cities at Risk from Sea Level Rise in 2070

## By Assets at Risk





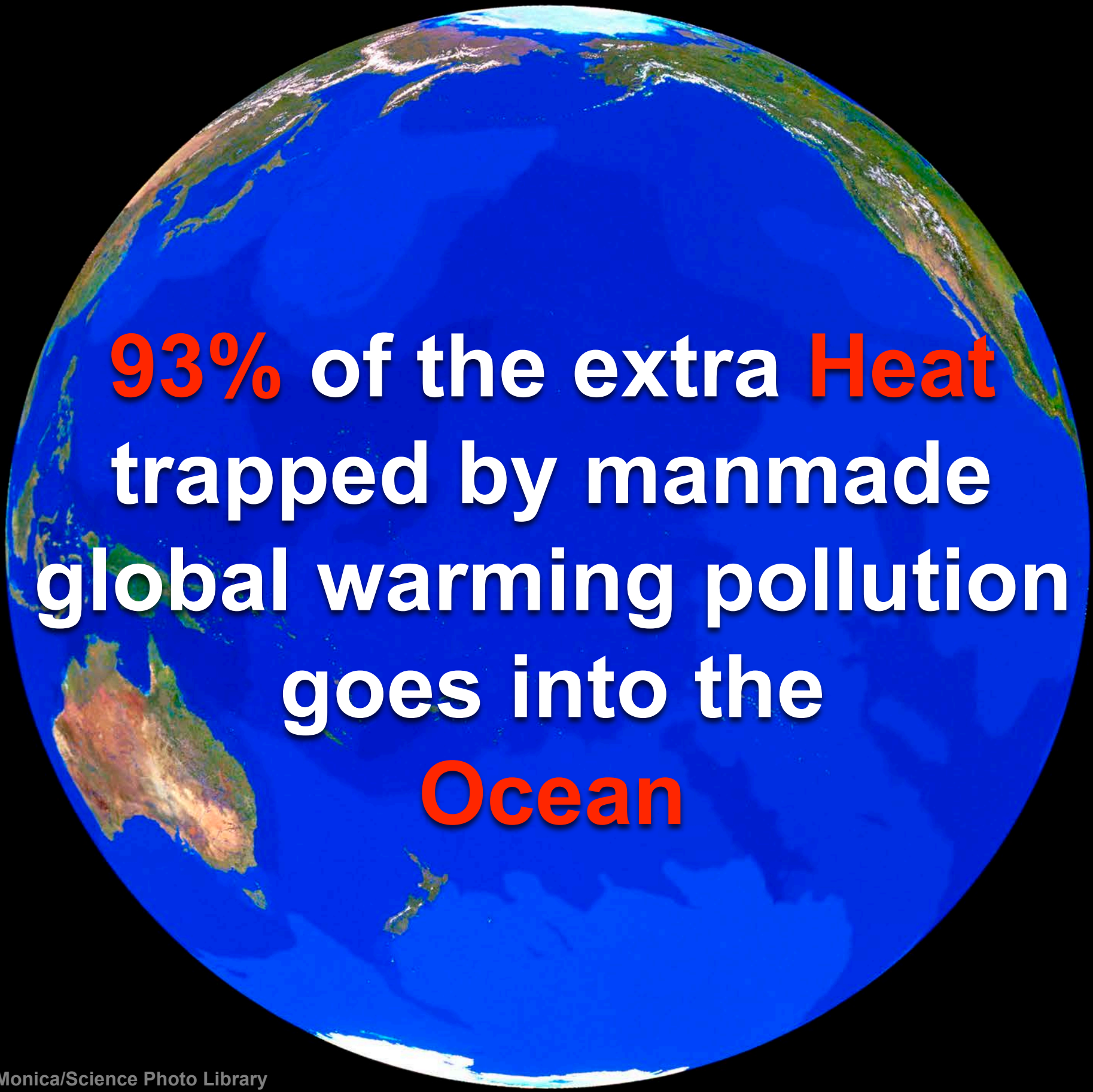
# Norfolk, Virginia

August 29, 2017



The frequency of high-tide flooding in the U.S. has doubled in 30 years.





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



**Economic losses  
from extreme weather  
totaled \$653 billion over the  
past two years alone.**



**The same extra heat that evaporates more water from the ocean, causing bigger downpours and floods...**

**...pulls moisture even more quickly from the soil, causing longer and deeper droughts.**



# Chembarambakkam Lake, Chennai, India

May 21, 2019

**Chennai, India's sixth largest city, is nearly out of water as its reservoirs have run dry.**



# Chennai, India

June 20, 2019

The drought is the worst in living memory for the residents of Chennai.





# Gunnedah, New South Wales, Australia

July 21, 2018



**Parts of eastern Australia  
are experiencing “the worst  
drought in living memory.”**




# Theewaterskloof Reservoir, Western Cape, South Africa

February 8, 2018

**South Africa's Western  
Cape province faced a  
severe drought in 2018.**



# Cape Town, South Africa

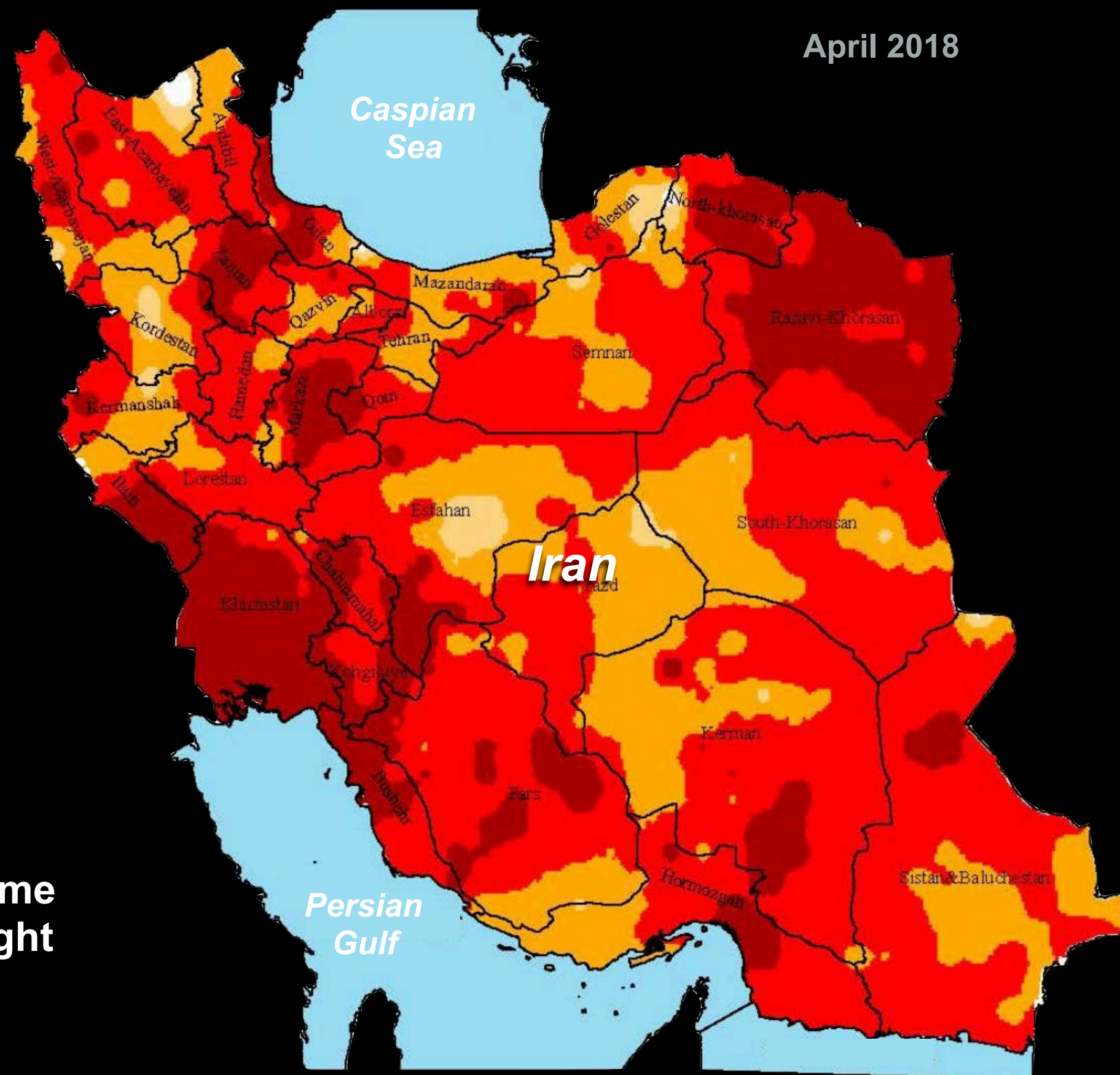
An aerial photograph of Cape Town, South Africa. The city is built into the slopes of Table Mountain, which dominates the background with its flat top. The foreground shows a dense urban area with a grid-like street pattern, interspersed with green spaces and some larger commercial buildings. The city meets the ocean at the bottom, with waves breaking on the shore and sandy beaches visible. The sky is overcast with grey clouds.

**In early 2018, Cape Town was at risk of running out of water.**



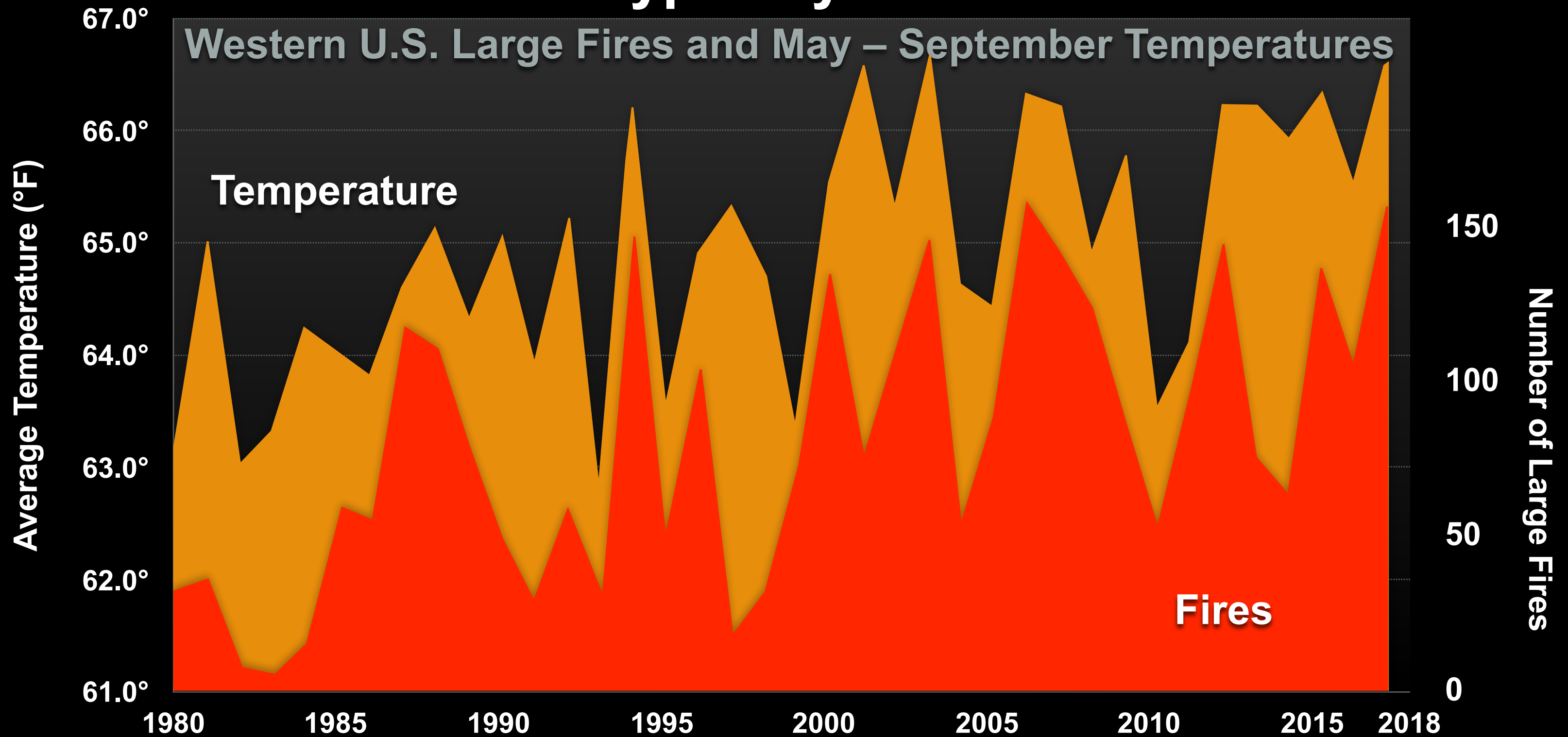
April 2018

**97% of Iran  
experienced a  
severe drought  
in 2018.**





# Hotter Years Typically Have More Fires





# Toledo, Spain

June 28, 2019

**The European  
heatwave made  
conditions ideal  
for wildfires.**



# Manning, Alberta, Canada

June 1, 2019

**10,000 people have  
been evacuated due  
to this wildfire.**



# Sokcho, South Korea

April 5, 2019

Hundreds of homes and buildings were destroyed.



# Edwards, Colorado

April 1, 2018

The **fire season** in  
the U.S. west is now  
**105 days longer**  
than in 1970.

Photo: © 2018 Chris Dillmann/Vail Daily via AP Source:  
Climate Central Western Wildfires—A Fiery Future, 2016



# Paradise, California

November 8, 2018

**The Camp fire killed 86 people  
and burned over 14,000 homes  
and businesses.**





# Lakeport, California

July 31, 2018

**The Mendocino Complex fire was the largest ever recorded in California—over half the size of Rhode Island.**



# The three most expensive wildfires in world history have happened in the last two years:

2018

Camp Fire

California

2017

Tubbs Fire

California

2018

Woolsey Fire

California

“Expensive” in terms of insured losses  
Photo © 2018 AP Photo/Noah Berger  
Data: Aon Benfield

*Camp Fire Damage, Paradise, California*



# Karbole, Sweden

July 15, 2018

Sweden experienced over 60 wildfires in 2018, including at least 8 above the Arctic Circle.





# Stalybridge, England

June 26, 2018





# Vichuquen, Chile

January 24, 2017

Over a million acres of land  
burned, and thousands  
were left homeless.



# Tonimbuk, Victoria, Australia

March 4, 2019



**At least 380 bushfires  
burned in Victoria  
during the first week  
of March 2019.**



# Tonimbuk, Victoria, Australia

Jan 2019



**January bushfires  
killed 33 people and  
destroyed 2,779  
homes**



# Central Russia

July 12, 2019

■ Fire

**An estimated 29 million acres (12 million hectares) of forest has burned in Russia so far this year, forcing the government to declare a state of emergency.**





# Moscow, Russia

August 9, 2010

**55,000  
people  
died**



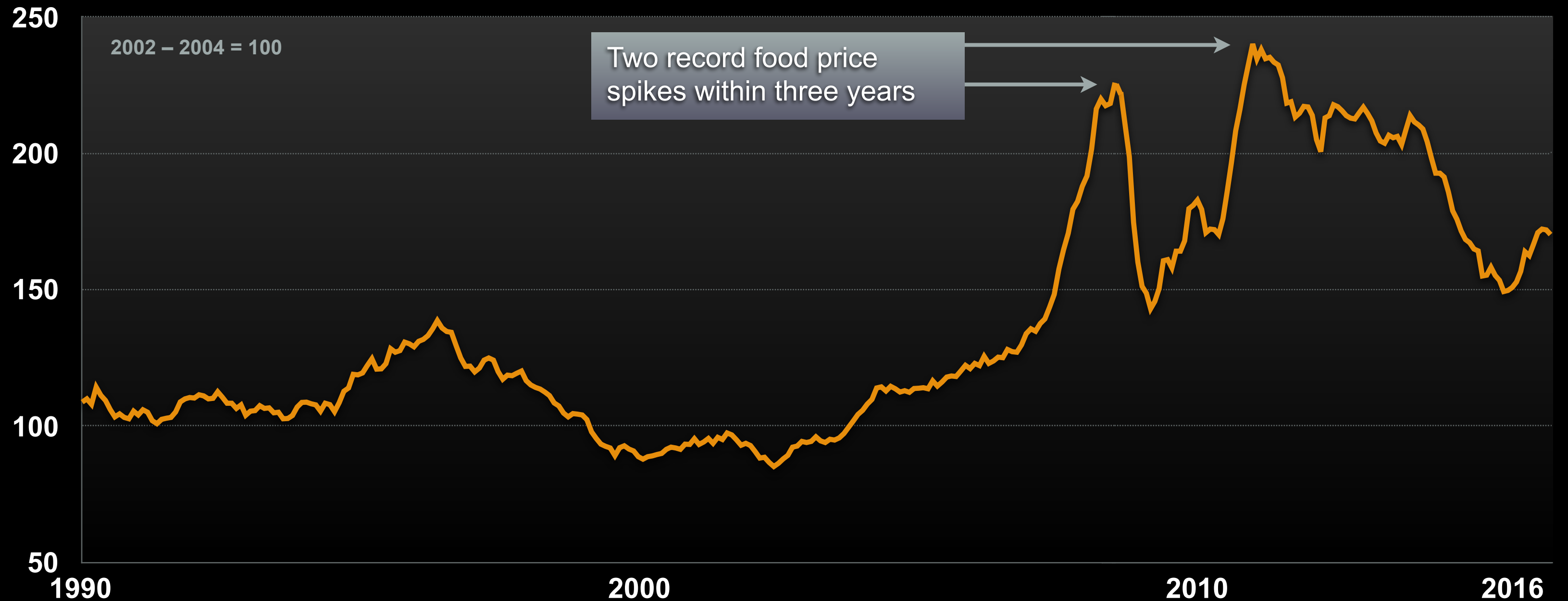
**Four months later...**

**World food prices reached record highs  
after Russia  
halted grain exports  
and Ukraine restricted them after the  
record drought and fires.**



# FAO Food Price Index

## 1990 – December 2016





# Tunis, Tunisia

January 14, 2011





The 2006 – 2010 drought  
turned **60%** of Syria's  
fertile land into desert

...and drove  
**1.5 million people**  
into Syria's  
already crowded cities



October 13, 2014

**U.S. Department of Defense**  
*2014 Climate Change Adaptation Roadmap*

**Climate change**  
**“will likely lead to**  
**food and water shortages,**  
**pandemic disease,**  
**disputes over refugees and resources,**  
**and destruction by natural disasters in**  
**regions across the globe.”**



# BREAKING POINT

The EU has failed us all

**We must break free of the EU and take back control of our borders.**

**Leave the European Union**

ON 23<sup>RD</sup> JUNE



[votetoleavetheeu.co.uk](http://votetoleavetheeu.co.uk)





**Populations of marine vertebrates declined  
49% on average from 1970 to 2012.**



**We now risk  
losing up to  
50% of all  
land-based  
species  
in this century**





# The Cost of Carbon

\$ *Political Instability*

\$ *Floods & Mudslides*

\$ *Wildfires*

\$ *Drought*

\$ *Storm Damage*

\$ *Ocean Acidification*

\$ *Infrastructure Loss*

\$ *Climate Refugees*

\$ *Species Extinction*

\$ *Melting Glaciers*

\$ *Famine*

\$ *Water Scarcity*

\$ *Ecosystem Loss*

\$ *Our Way of Life*

\$ *Infectious Diseases*

\$ *Sea Level Rise*



\$ *“The #1 Threat to the  
Global Economy”*

*... And much, much more*



# Global Energy Subsidies

\$5.5 T  
\$5.0 T  
\$4.5 T  
\$4.0 T  
\$3.5 T  
\$3.0 T  
\$2.5 T  
\$2.0 T  
\$1.5 T  
\$1.0 T  
\$0.5 T  
\$0.0 T

**\$143 Billion**

**Renewables**

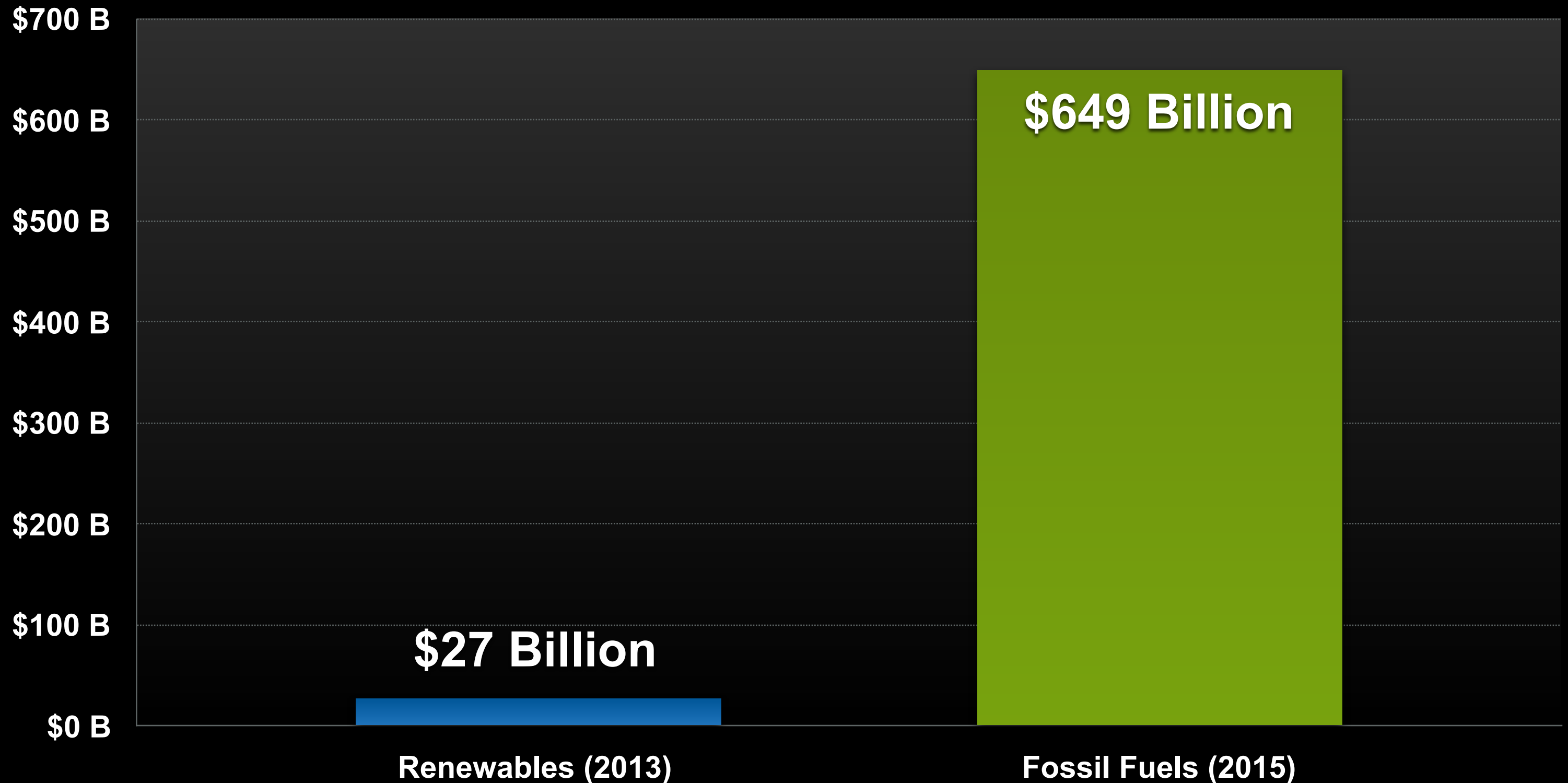
**\$5.2 Trillion**

**36x**

**Fossil Fuels**



# Energy Subsidies in the United States



Sources: International Energy Agency, International Monetary Fund



**So...**

**Must we change?**

**Yes!**



**2. Can we change?**



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



“Coal is the future.”

•

Gregory Boyce CEO Peabody Energy

December 2010



# Green Energy Progress

## How Do Projections Compare With Reality?

### 2000 Projection

Worldwide  
wind capacity  
will reach 30  
GW by 2010

### Reality

By 2018 that goal  
was exceeded by  
a factor of

**20 x**



# Global Wind Energy Capacity

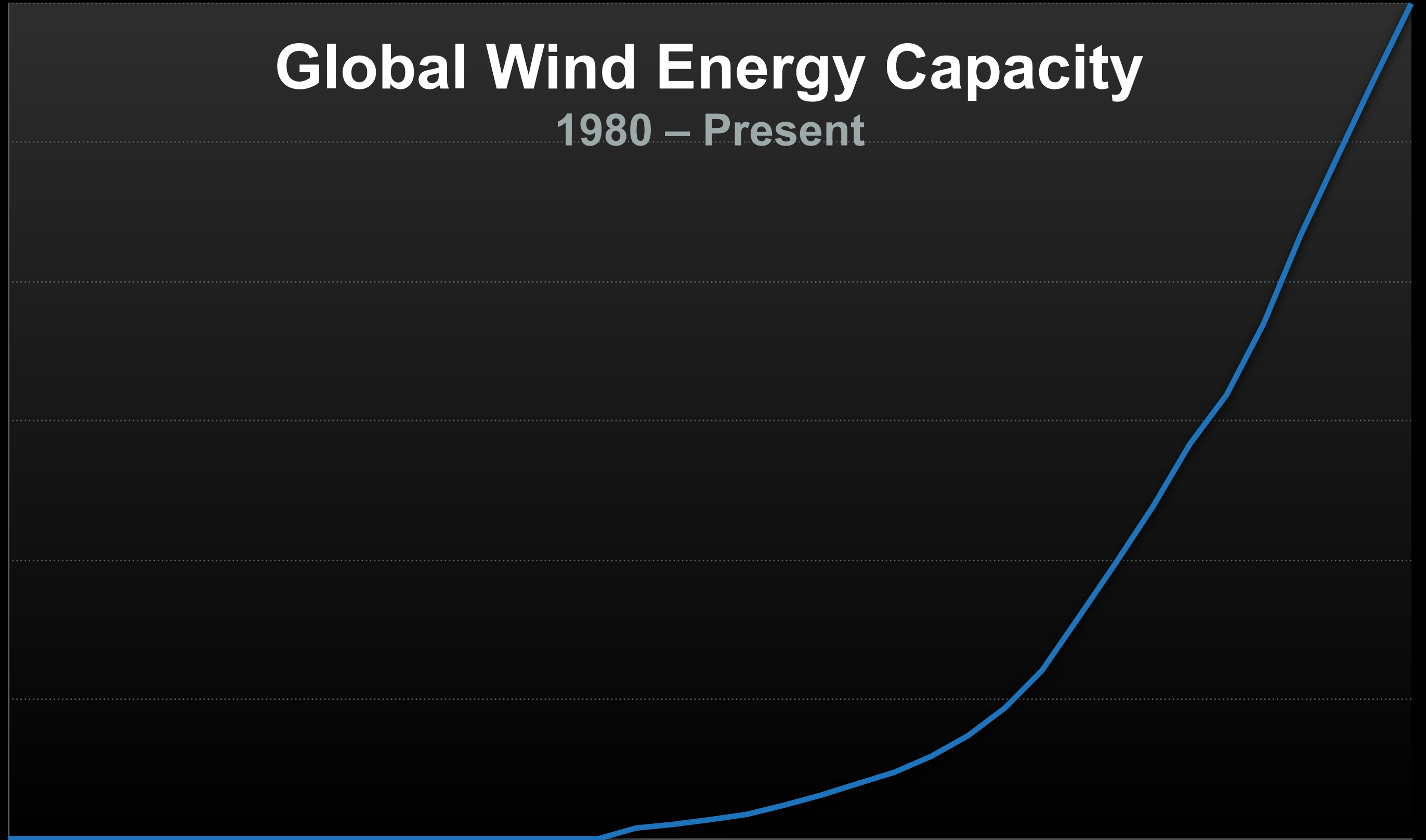
## 1980 – Present

Wind Capacity (Megawatts)

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

1980 1985 1990 1995 2000 2005 2010 2015 2018

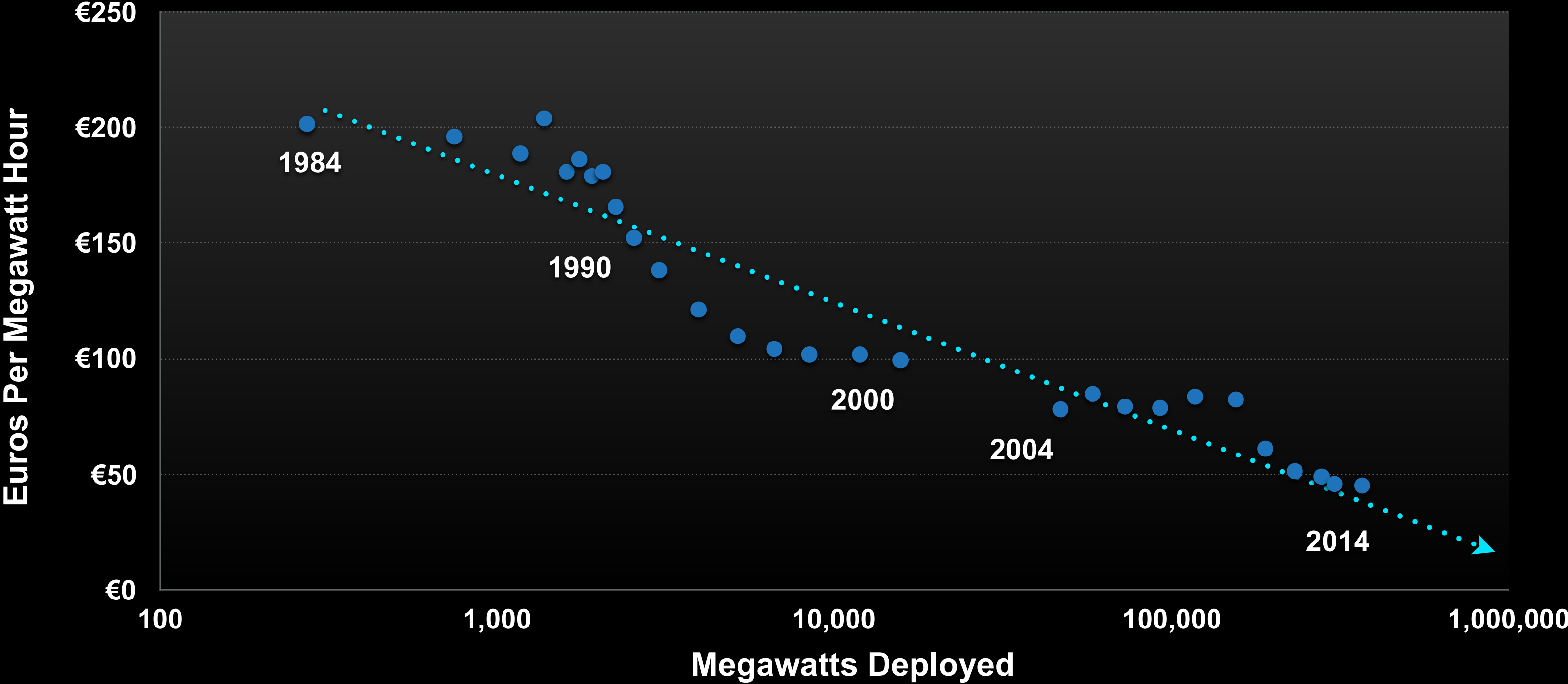
Data: Earth Policy Institute/Bloomberg New Energy Finance





# Onshore Wind Cost

1984 – 2014





**Globally, wind could supply  
worldwide electricity consumption  
40 times over**





Some utilities in Texas are offering  
**free electricity at night**  
because wind energy is so abundant.



**Wind power generated more electricity  
than coal in Texas in the first half of 2019.**





**Globally, wind could supply  
worldwide electricity consumption  
40 times over**



# Sieversdorf, Germany

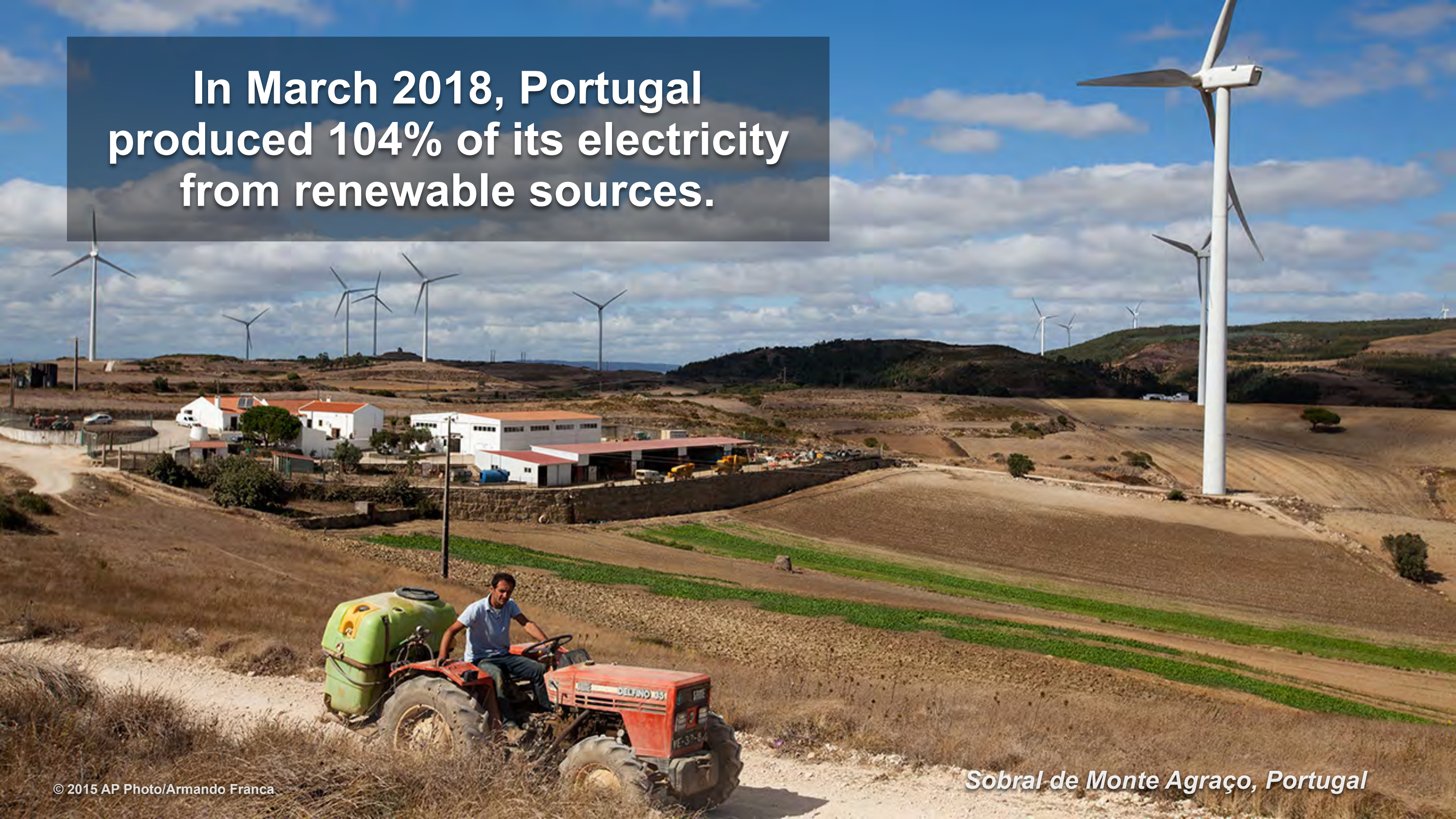
April 13, 2018




**In 2018, renewables  
provided more power  
in Germany than coal.**



**In March 2018, Portugal  
produced 104% of its electricity  
from renewable sources.**







**In the first half of 2019,  
Scotland produced enough  
wind energy to power all of its  
households almost twice over.**



# Royds Farm, Yorkshire, England



**The United Kingdom generated more than three times as much energy from wind as from coal in 2018.**



**“Today more than two-thirds of the global population lives in countries where solar and wind are the cheapest sources of new bulk generation.”**

**Bloomberg New Energy Finance**  
***New Energy Outlook 2019***



# Solar Energy Progress

How Do Projections Compare With Reality?

## 2002 Projection

The solar energy market will grow one gigawatt per year by 2010

## Reality

The reality is that in 2018 it was exceeded by

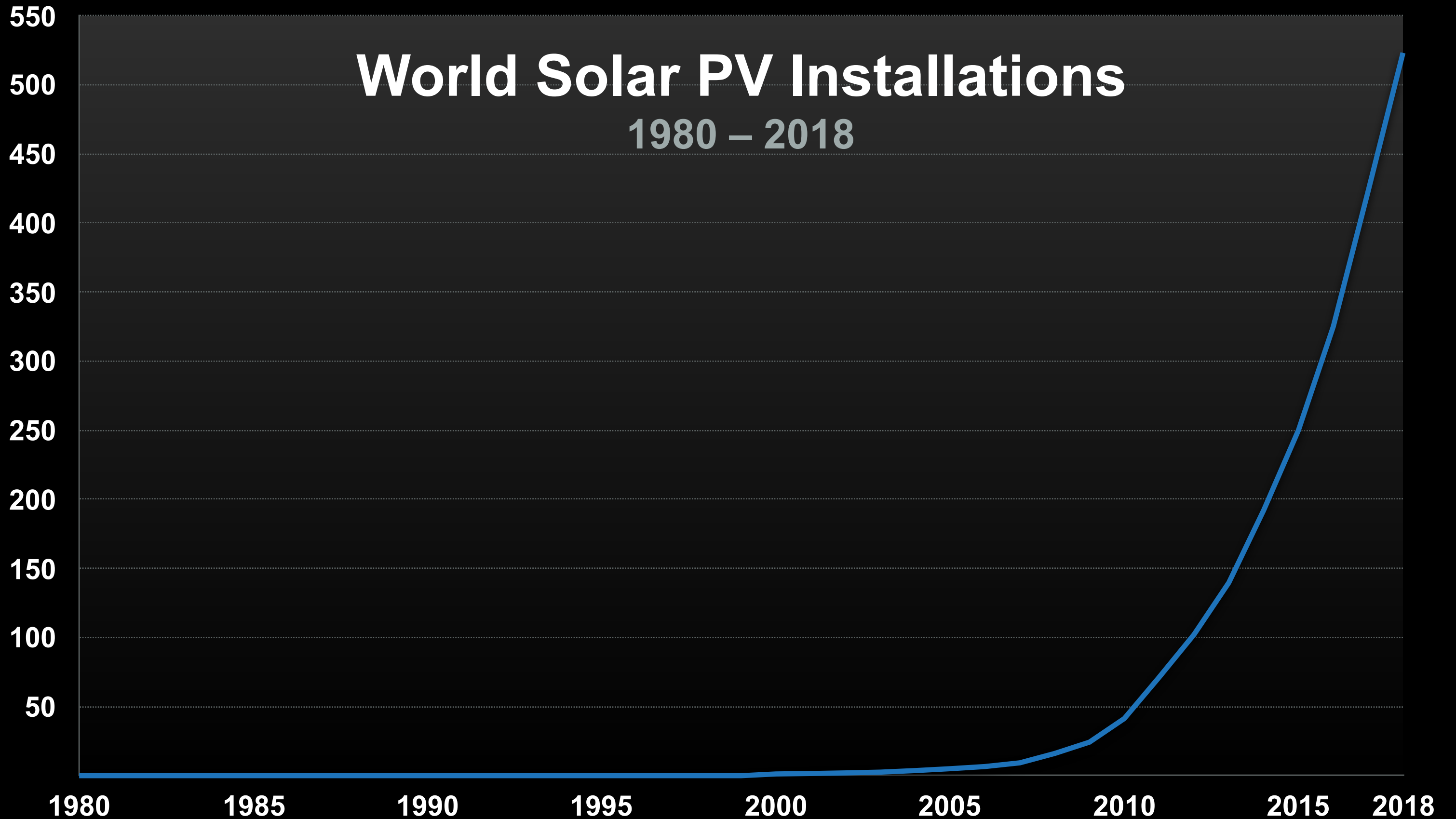
**109x**



# World Solar PV Installations

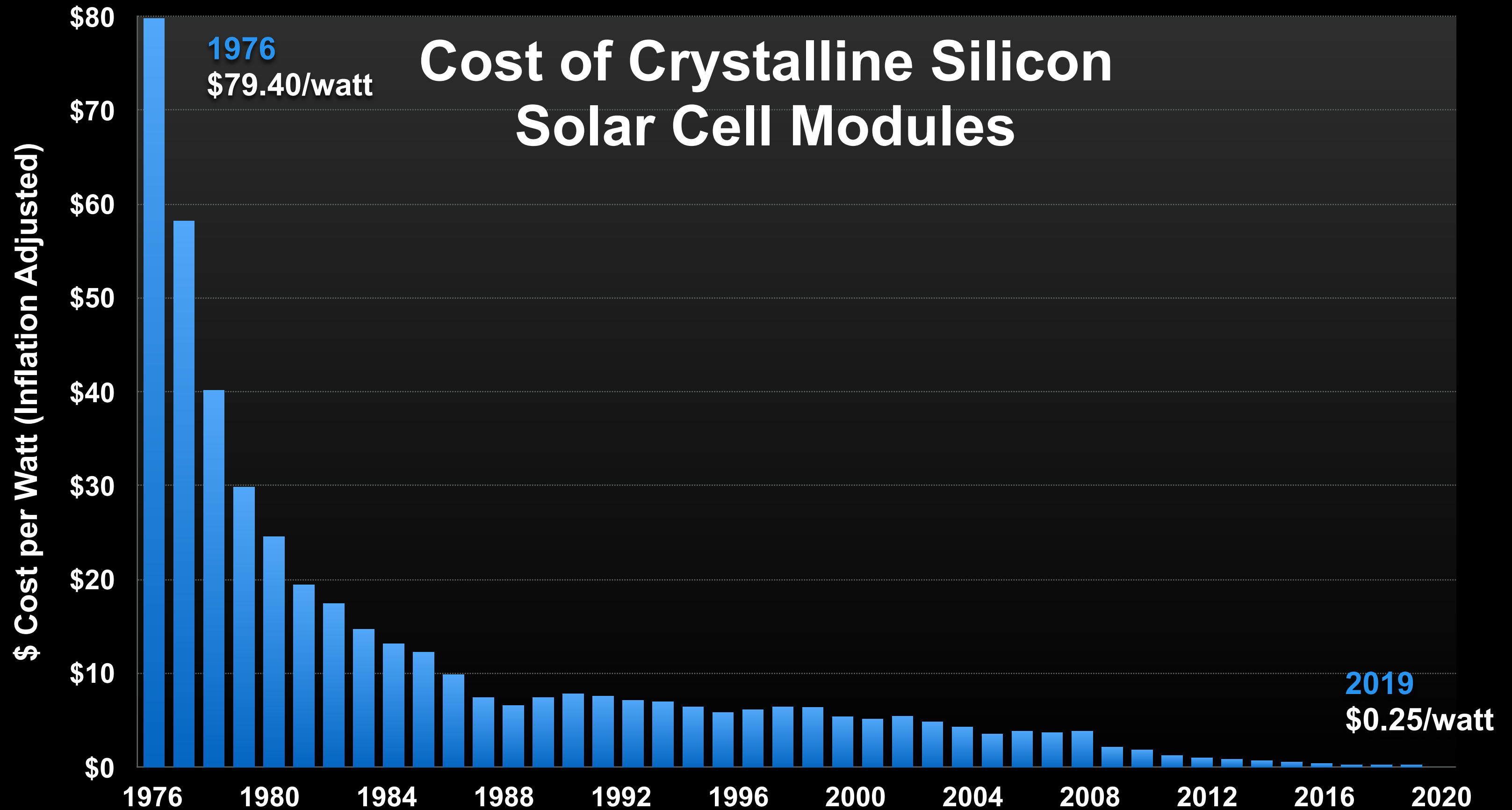
## 1980 – 2018

Gigawatts (Cumulative)





# Cost of Crystalline Silicon Solar Cell Modules





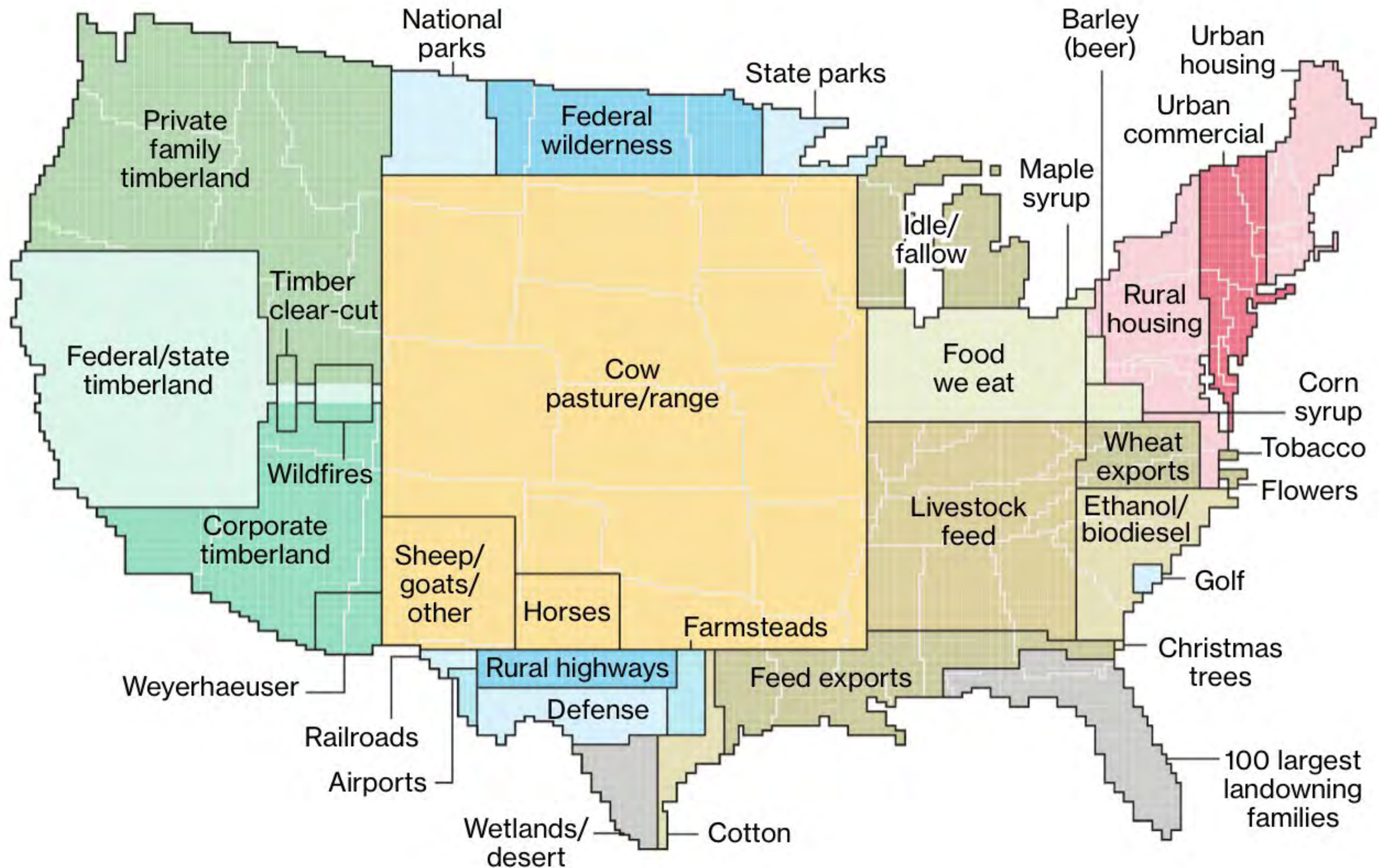
**In June 2018,  
Nevada's NV Energy  
signed an agreement to  
purchase solar electricity at  
2.4 cents per kilowatt hour,  
the lowest price paid so far  
in the United States.**



Enough solar energy reaches Earth **every hour**  
to fill all the world's energy needs **for a full year**









The share of Germany's electricity from renewables peaked at **100%** on both January 1 and May 1, 2018.





More than two million residential properties in  
Australia now have solar systems installed.

That's more than **one in five** houses.





An aerial photograph of a large-scale solar farm. The image shows numerous rows of rectangular solar panels installed on a grassy, slightly hilly terrain. The panels are arranged in neat, parallel lines, following the contours of the land. A dirt road or path runs through the middle of the solar array, separating different sections. In the background, a small building, likely a control or maintenance structure, is visible. The overall scene depicts a significant investment in renewable energy infrastructure.

**On April 28, 2018, California's primary grid  
reached 73% renewable electricity generation.**

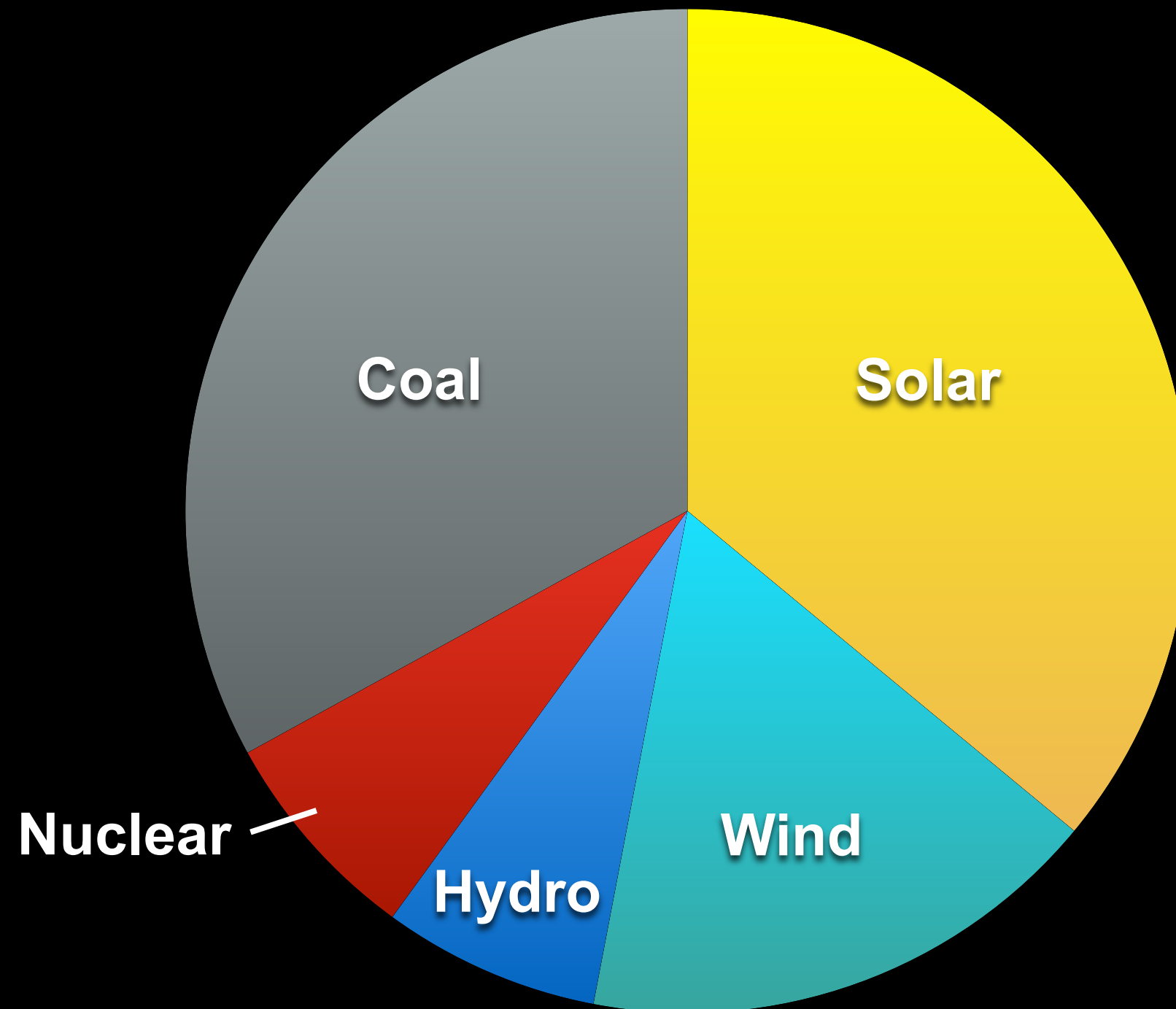


# The Vatican





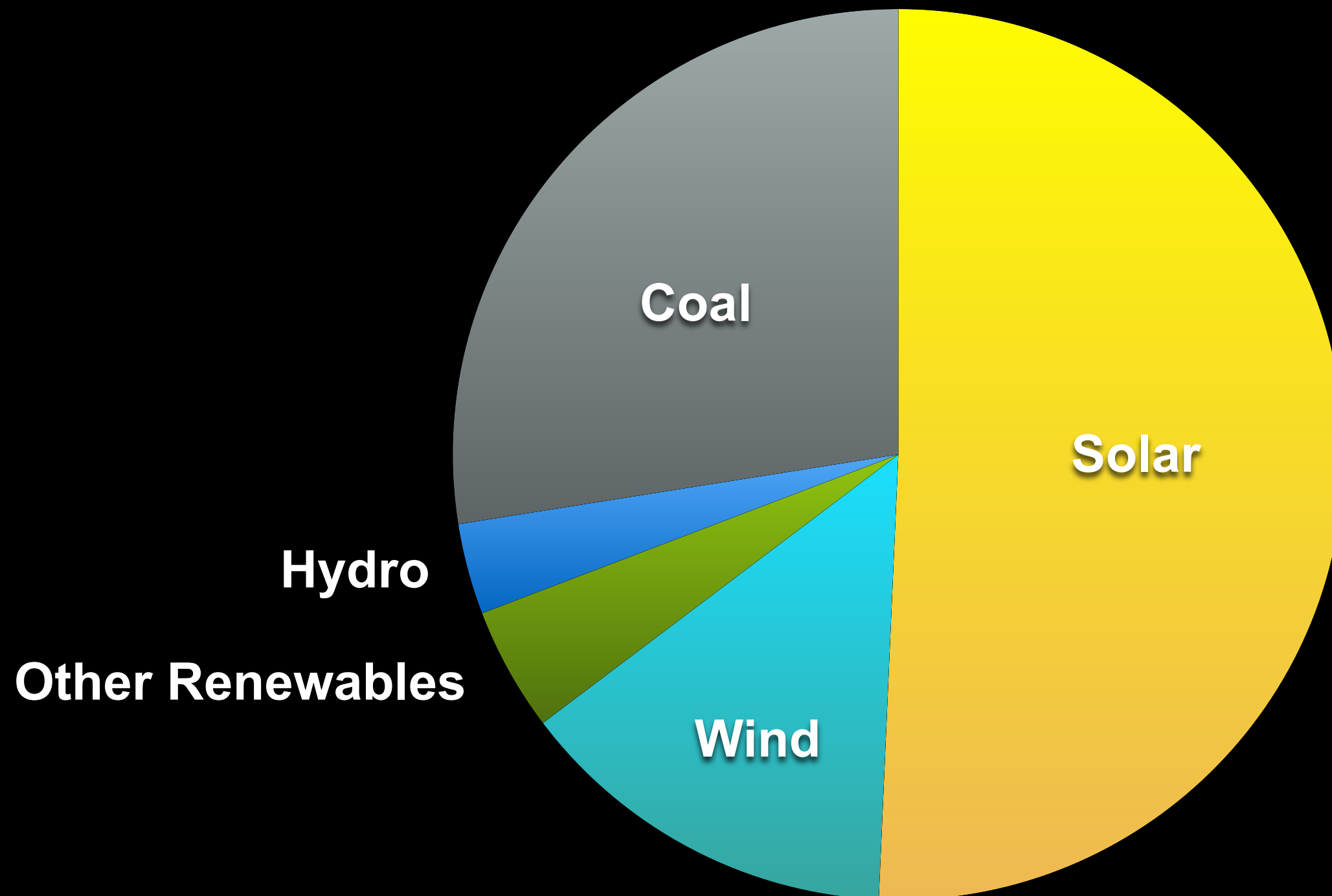
# New Electricity Capacity in China, 2018



**53% of new capacity was from solar and wind.**



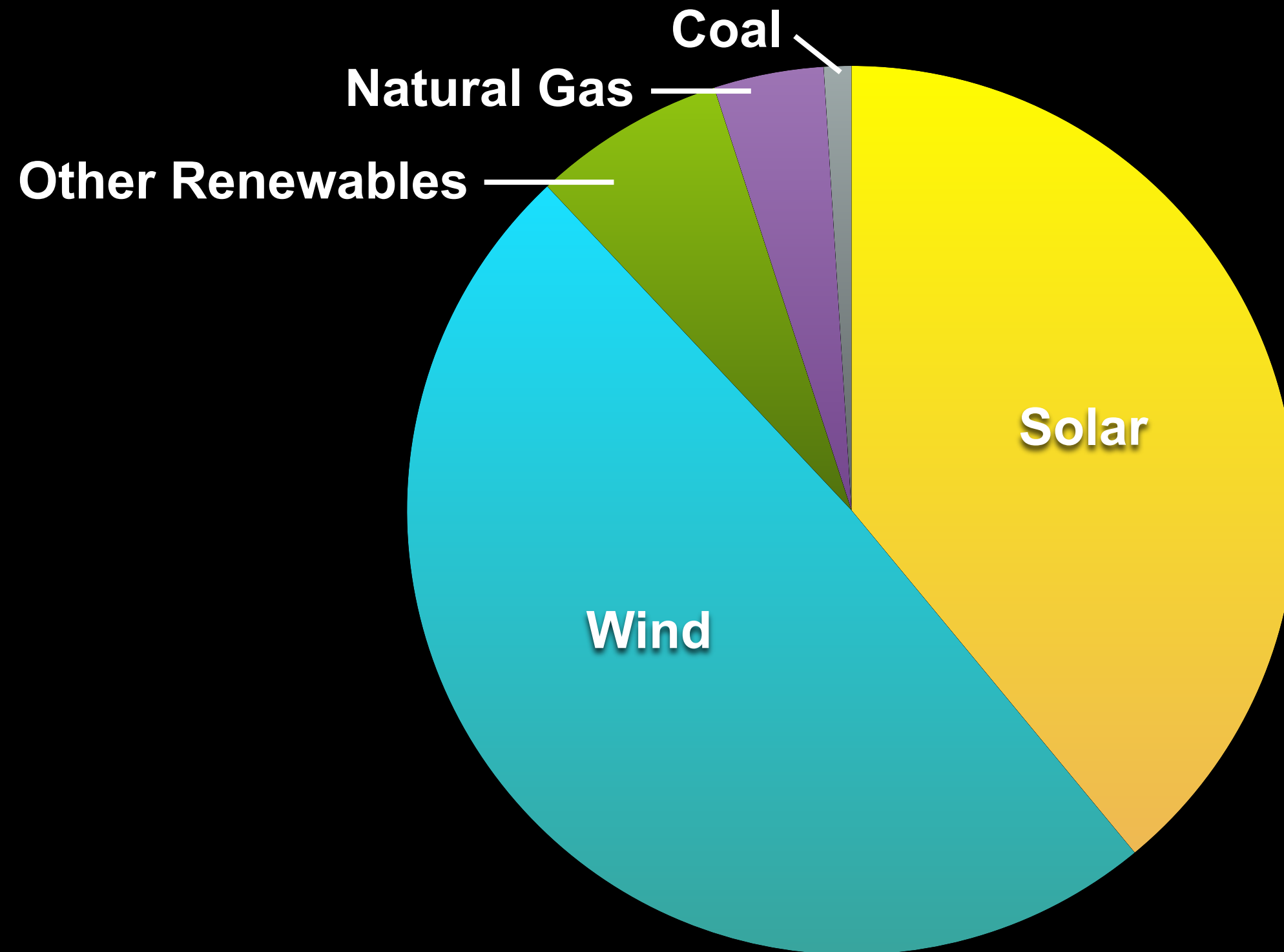
# New Electricity Capacity in India, 2018



**65% of new capacity was from solar and wind.**



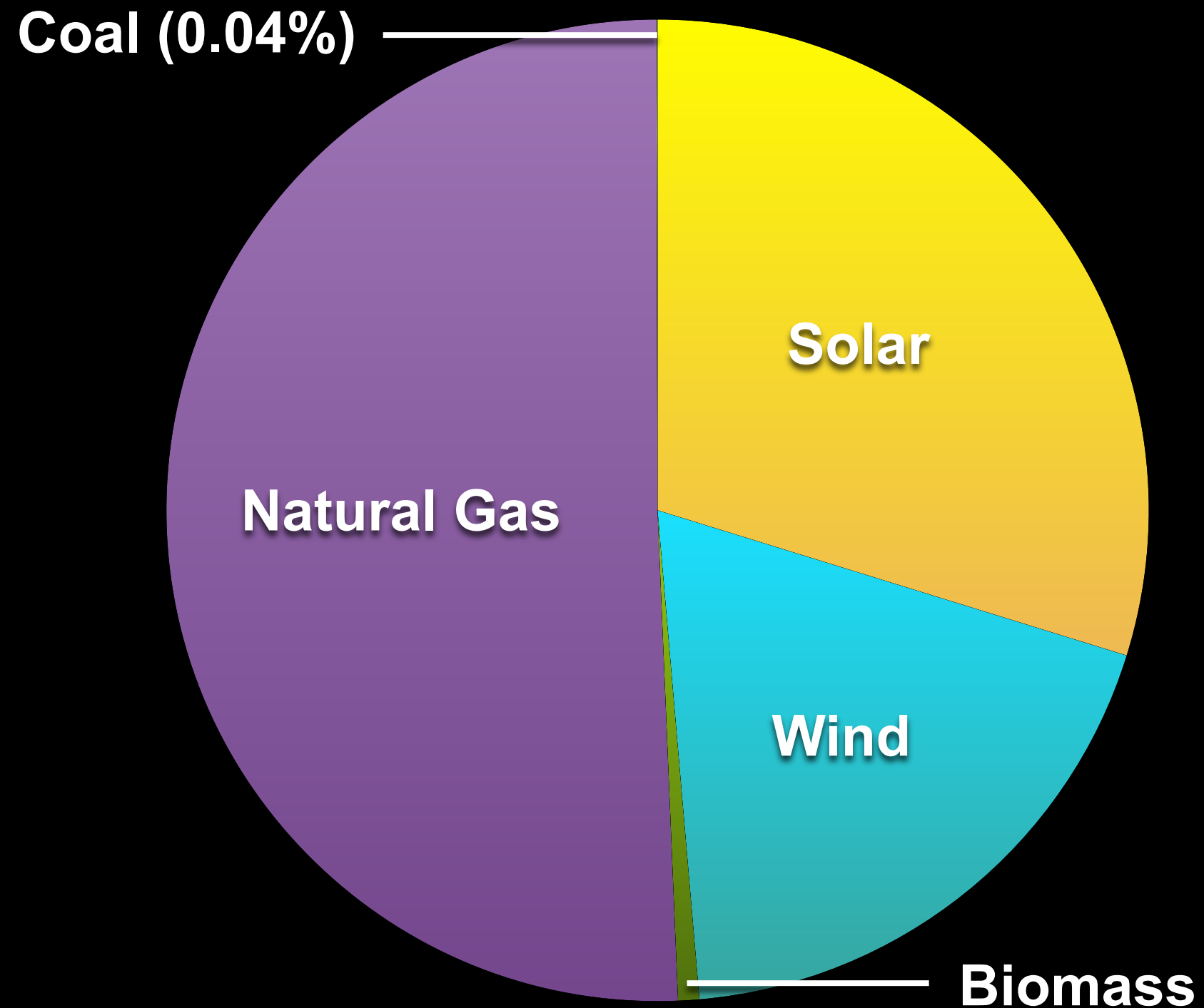
# New Electricity Capacity in Europe, 2018



**88% of new capacity was from solar and wind.**



# New Electricity Capacity in the U.S., 2018



**49% of new capacity was from solar and wind.**



# KENTUCKY COAL MINING MUSEUM



# Kentucky Coal Mining Museum Benham, Kentucky

April 2017



**The museum estimates they will save \$8,000 to \$10,000 per year in energy costs.**



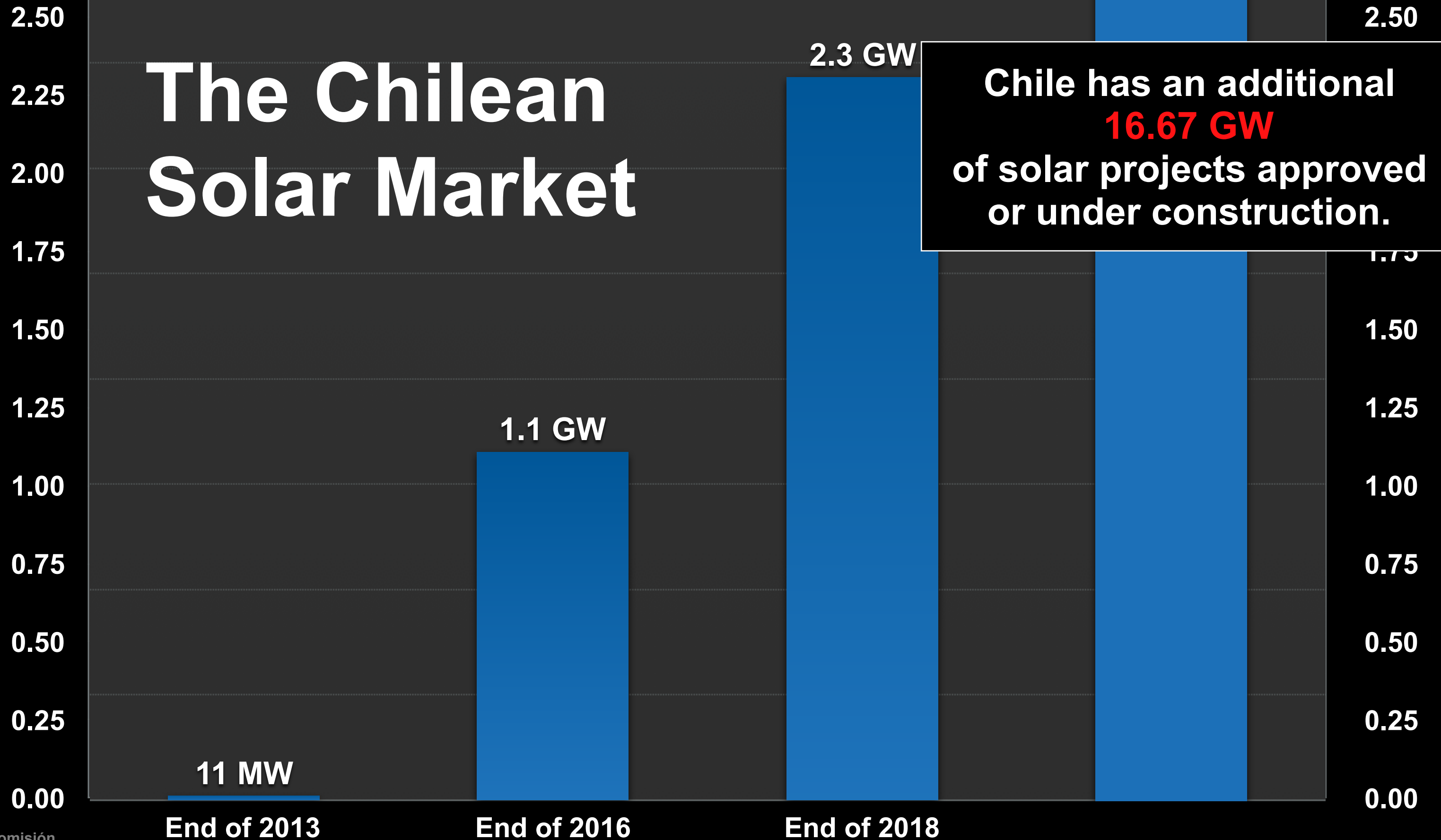
# Copiapó, Chile





# The Chilean Solar Market

Installed Capacity (GW)





# Renewable Energy in India

Installed Capacity (GW)

By 2030, India plans to have  
**500 gigawatts**  
of renewable electricity  
capacity in place.

0.0

2013

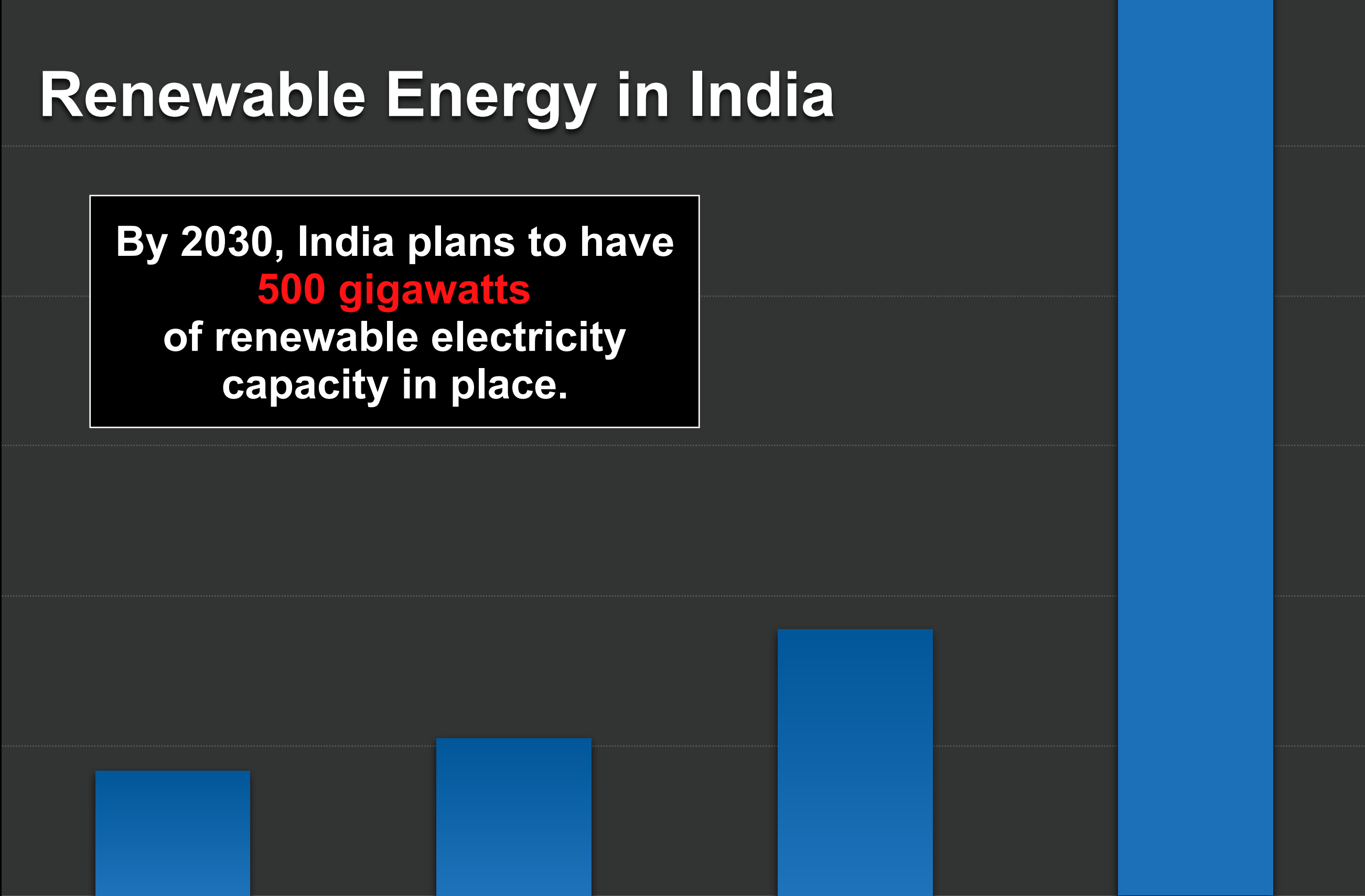
2015

2017

2030

0.0

Data: 2017 India's Ministry of New and  
Renewable Energy (MNRE)



125.0

100.0

75.0

50.0

25.0

0.0

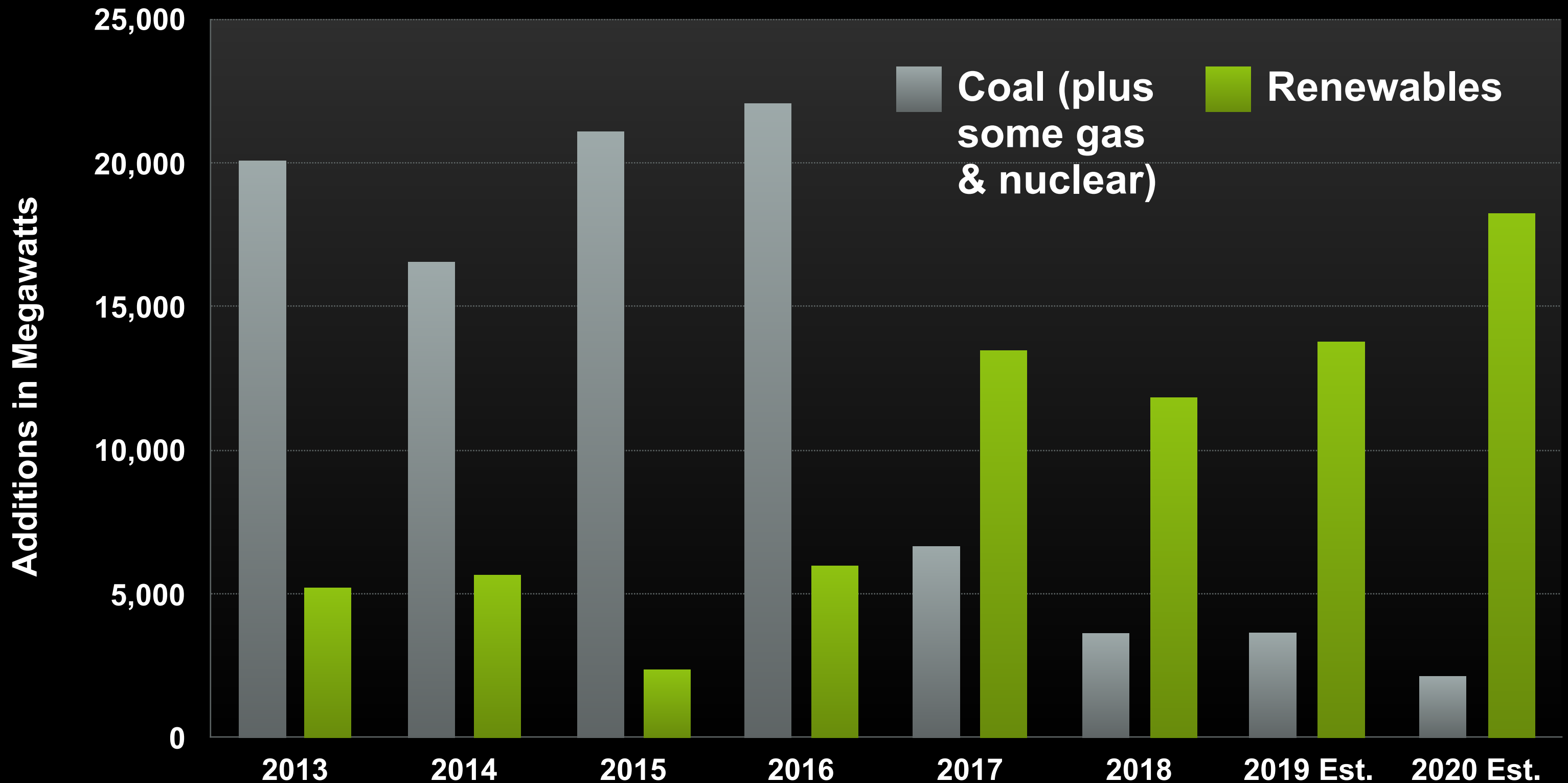


**In July 2018, India received  
bids for solar power at  
2.44 rupees per kilowatt-hour.**

**This is 24% lower than the average  
cost for coal-fired electricity in India.**



# Electricity Capacity Additions in India



Data: Central Electricity Authority of India; MNRE India; IEEFA estimates via FT



**“You’d have to be quite  
courageous to invest in coal  
[in India] at this point.”**

**Navroz Dubash  
New Delhi’s Centre for Policy Research**

**December 2018**



# Global Cumulative Storage Capacity

## Historical

Gigawatts

3.0  
2.5  
2.0  
1.5  
1.0  
0.5  
0.0

2011

2012

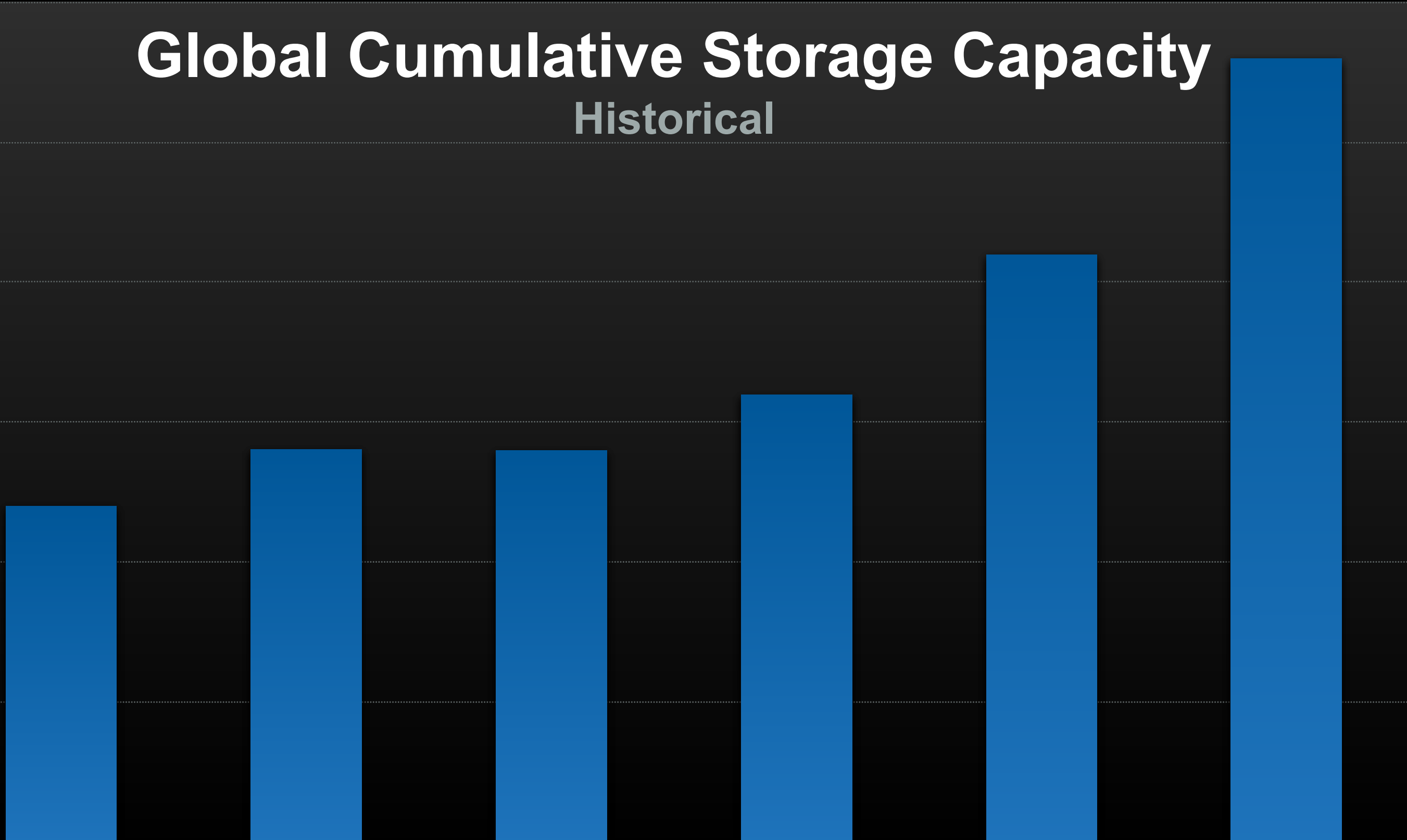
2013

2014

2015

2016

Data: Bloomberg New  
Energy Finance





# Global Cumulative Storage Capacity

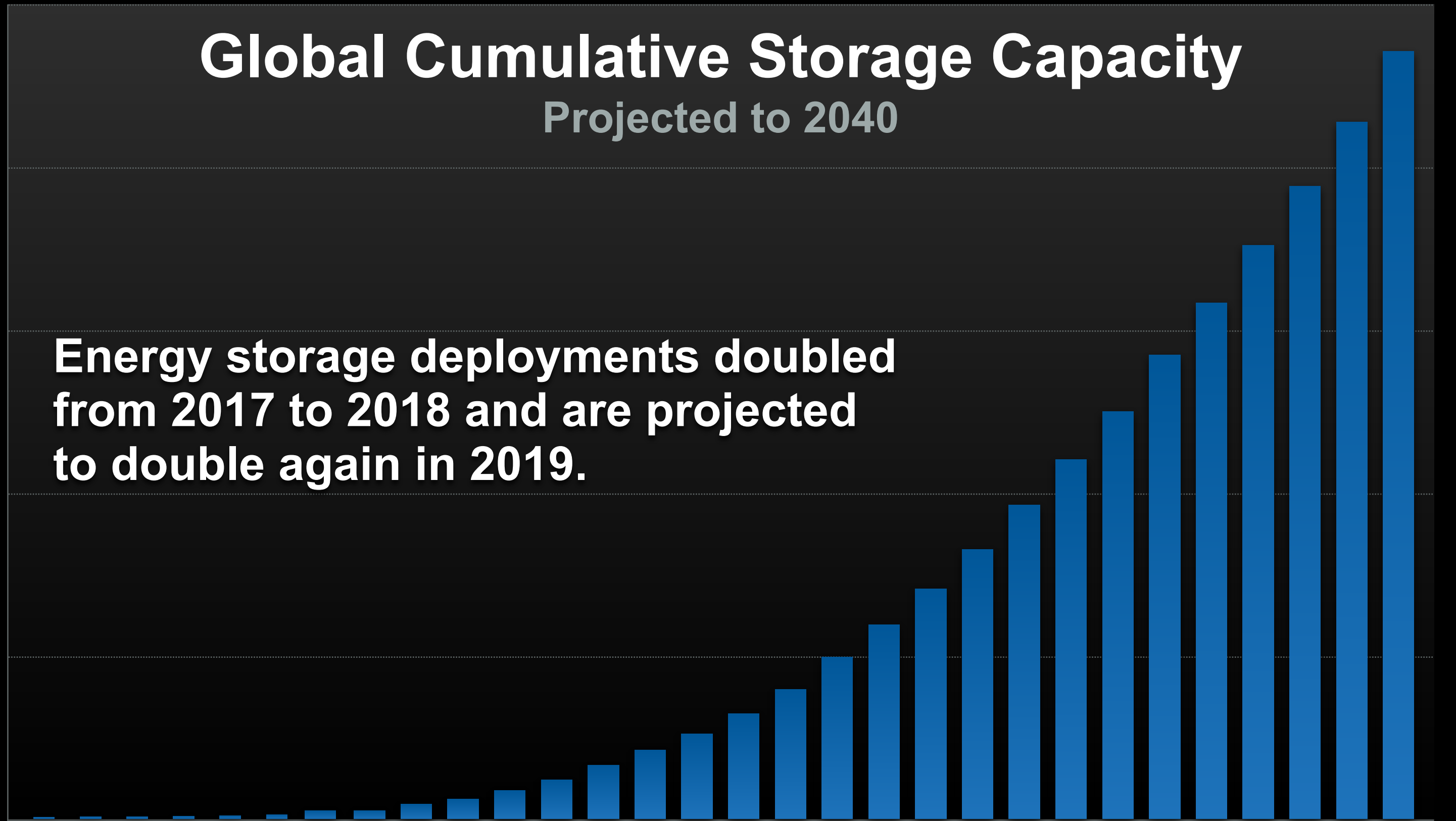
## Projected to 2040

Gigawatts

Energy storage deployments doubled from 2017 to 2018 and are projected to double again in 2019.

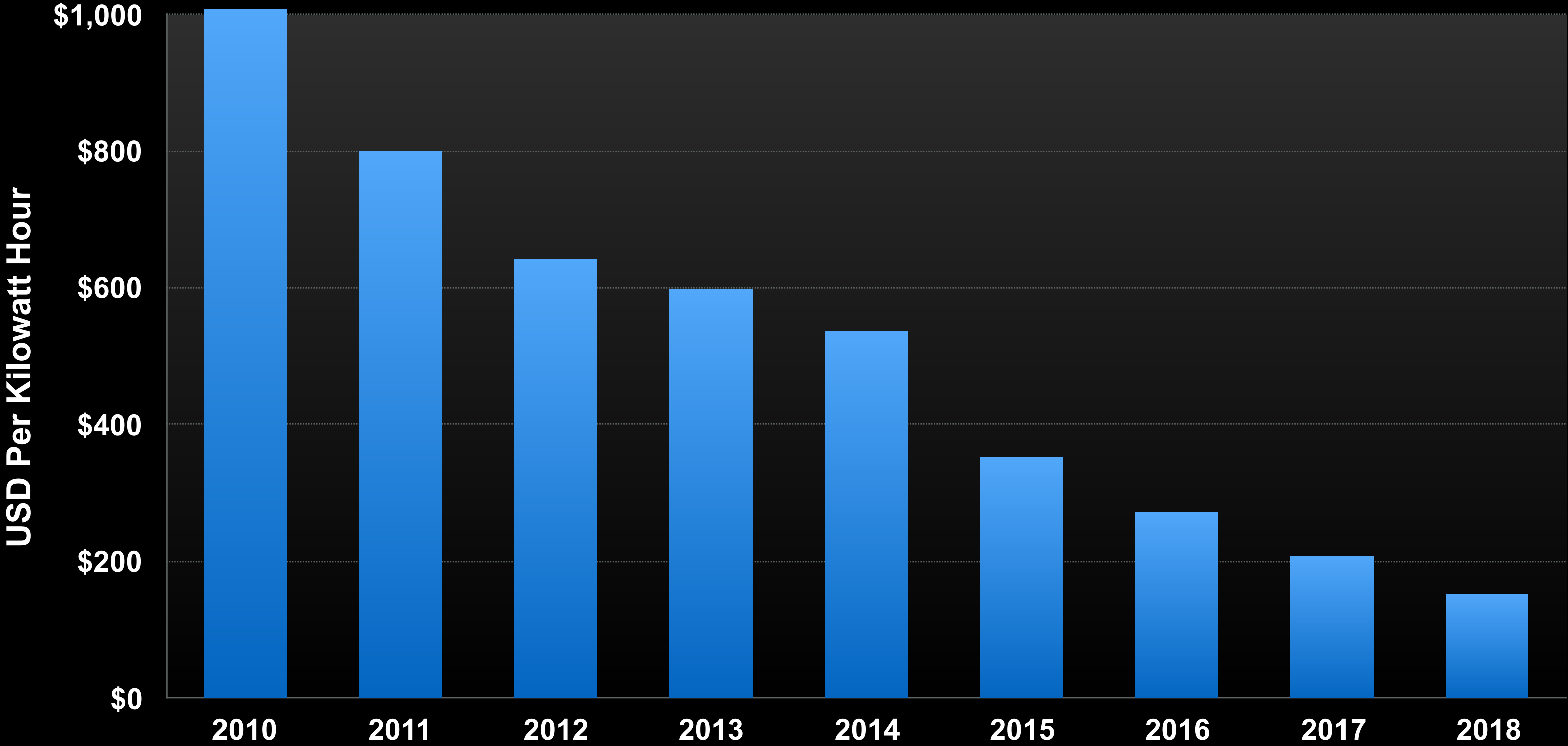
Data: Bloomberg  
New Energy Finance

2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040





# Lithium-ion Battery Prices



Data: Bloomberg New Energy Finance (volume-weighted averages)



# Hornsedale, South Australia

September 29, 2017



**Tesla has built the  
world's largest lithium ion battery  
at a wind farm in South Australia**



# Manatee County, Florida

An aerial photograph of a large industrial power plant facility. Two tall, red-and-white striped smokestacks are prominent, emitting thick white plumes of smoke that rise into the sky. The plant itself is a complex of various structures, including large cylindrical storage tanks, piping, and scaffolding. The facility is situated on a grassy area adjacent to a body of water, with a long pier or causeway extending into the water. The overall scene depicts a major industrial operation.


Florida Power and Light just announced it will replace two natural gas-fired power plants with solar farms and a new battery system **four times larger** than the now largest.

From Bradenton Herald. ©2019 McClatchy. All rights reserved. Used under license.



# Los Angeles, California

November 22, 2016

 Microsoft Camera





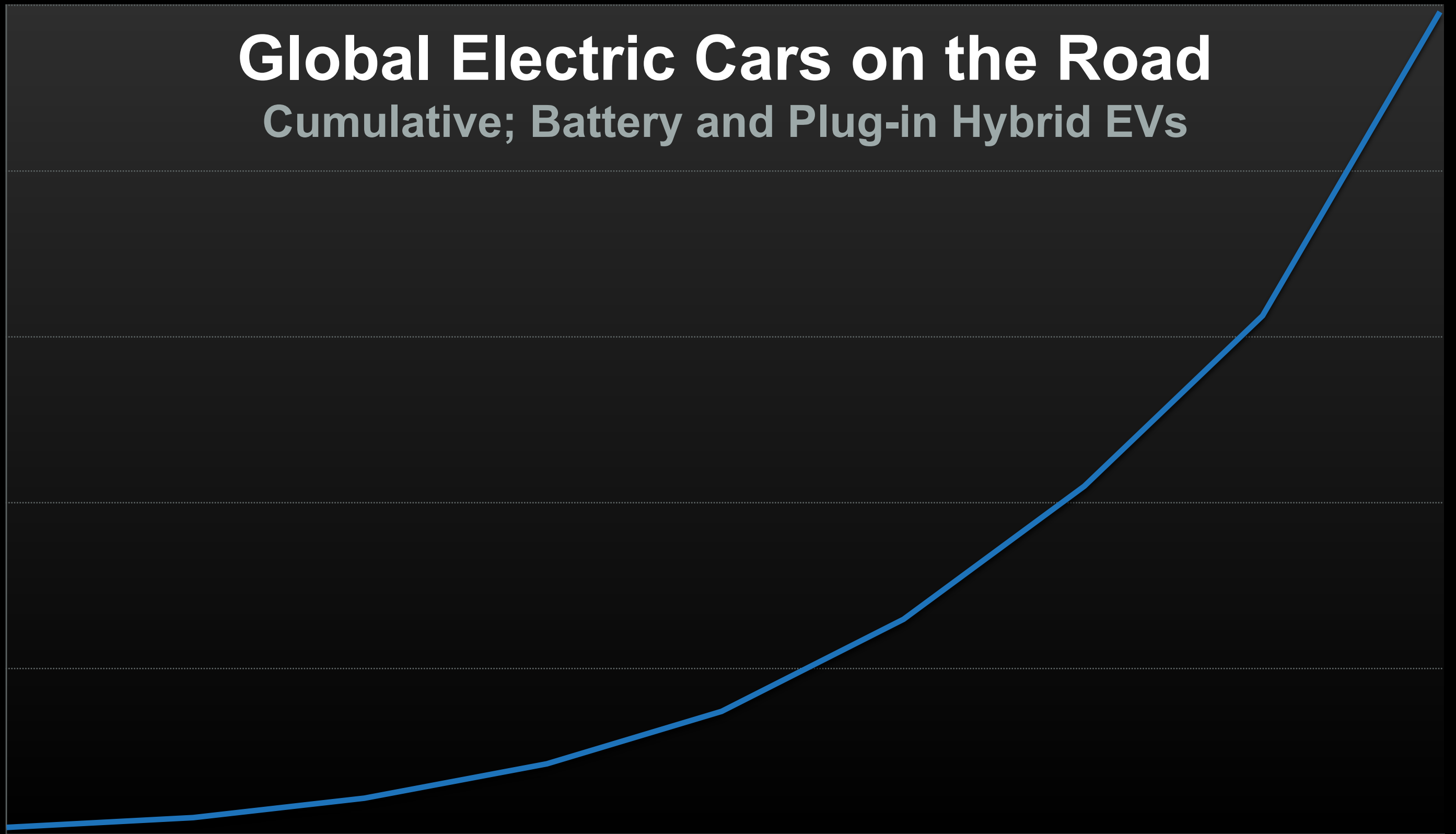
# Global Electric Cars on the Road

Cumulative; Battery and Plug-in Hybrid EVs

Electric Car Stock (Millions)

5.0 M  
4.0 M  
3.0 M  
2.0 M  
1.0 M

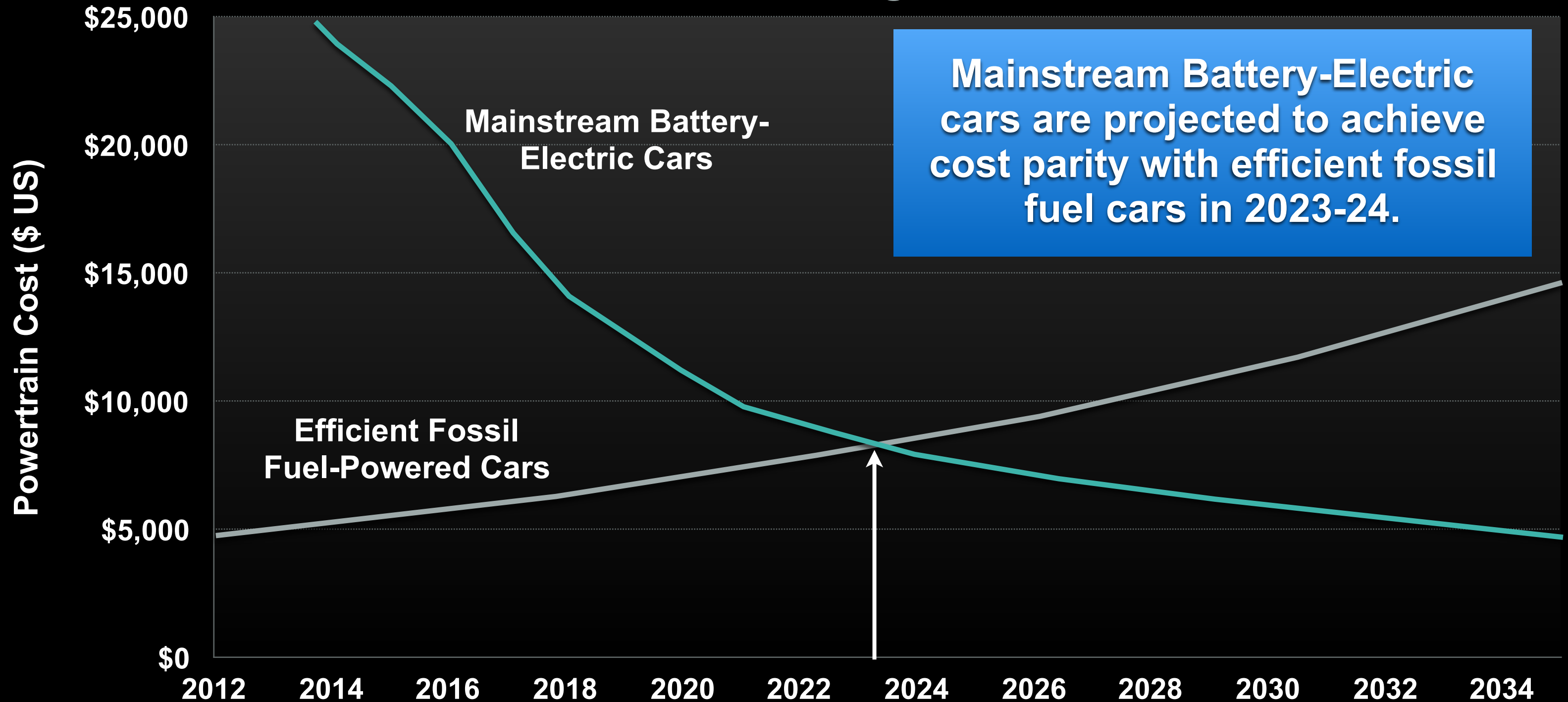
2010 2011 2012 2013 2014 2015 2016 2017 2018





# Powertrain Cost Comparison

## 600kWh / 500km Range Without Subsidies

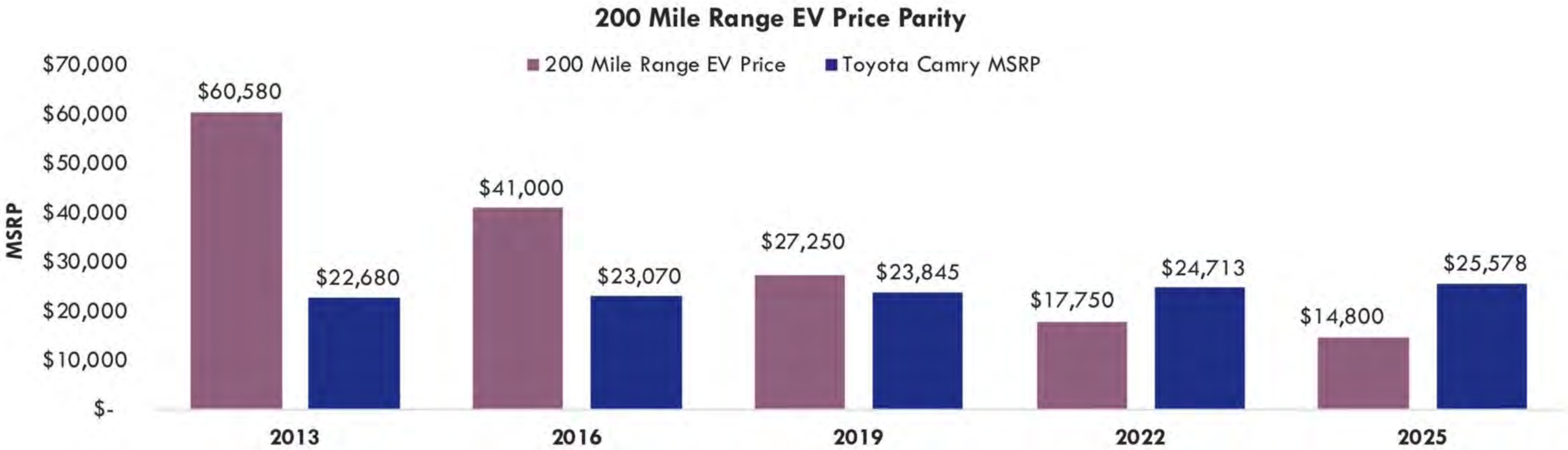






# Thanks to Battery Cost Declines, EVs Should be Cheaper Than Comparable Gas-Powered Cars by 2022

- Battery costs should continue to drop, pushing EV prices below gas-powered vehicles in the early 2020s.
- In 2025 EVs should be competitive with gas powered cars at every price point, unleashing tremendous demand.



Forecasts are inherently limited and cannot be relied upon.  
Source: ARK Investment Management LLC, 2018 | ARK's expectation for EV MSRP (Manufacturer's Suggested Retail Price) parity is largely based on decreasing lithium-ion battery costs. Other factors could influence MSRP. The MSRP prices shown do not include any government subsidies.



# Countries Planning a Fossil Fuel Vehicle Phase-Out:

[illegible]



# For the first time, an electric car is in the top ten

## US Top 10 Best Selling Passenger Cars

| Model Name ▲     | Last Month ▼ | Previous Month LY ▲ | Change ▲ | YTD ▲   | YTD LY ▲ | Change ▲ |
|------------------|--------------|---------------------|----------|---------|----------|----------|
| Toyota Camry     | 26,309       | 29,093              | -9.57%   | 336,978 | 343,439  | -1.88%   |
| Toyota Corolla   | 23,742       | 25,439              | -6.67%   | 304,850 | 303,732  | 0.37%    |
| Honda Civic      | 22,913       | 26,384              | -13.16%  | 325,650 | 325,760  | -0.03%   |
| Honda Accord     | 19,682       | 28,627              | -31.25%  | 267,567 | 291,071  | -8.08%   |
| Nissan Altima    | 19,132       | 17,064              | 12.12%   | 209,183 | 209,146  | 0.02%    |
| Hyundai Elantra  | 18,720       | 15,076              | 24.17%   | 175,094 | 200,415  | -12.63%  |
| Tesla Model 3    | 15,566       | 25,250              | -38.35%  | 161,100 | 140,317  | 14.81%   |
| Chevrolet Malibu | 11,299       | 12,522              | -9.77%   | 120,302 | 144,542  | -16.77%  |
| Nissan Sentra    | 11,033       | 17,567              | -37.19%  | 184,618 | 213,046  | -13.34%  |
| Ford Fusion      | 10,582       | 16,052              | -34.08%  | 166,045 | 173,600  | -4.35%   |



# Auto Manufacturers Are Moving to Electric Vehicles

Companies with Electric Models in Production

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



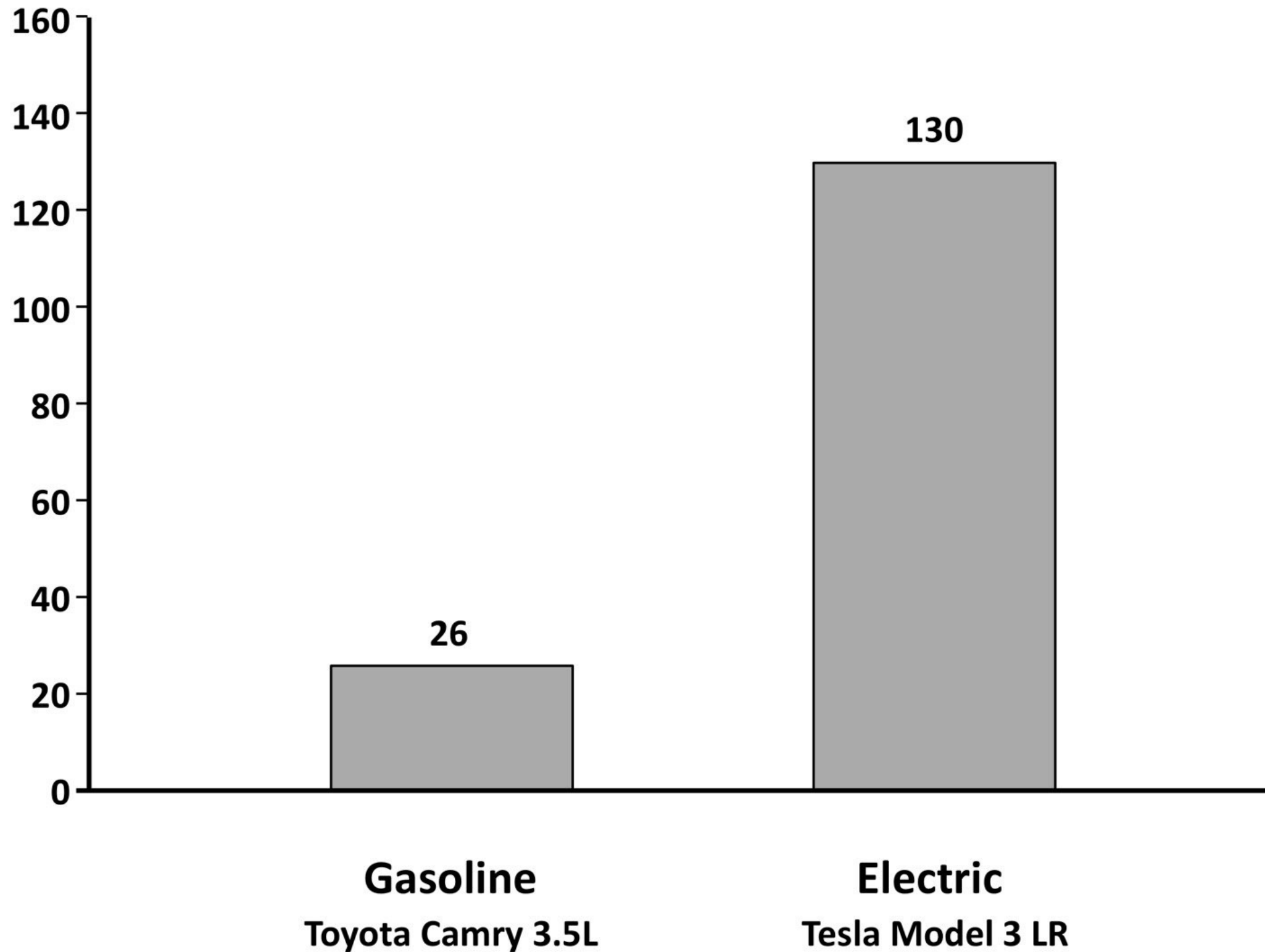
**“General Motors believes  
the future is all electric.”**

**Mark Reuss, General Motors  
EVP of Global Product Development**

**October 2, 2017**



# Miles per Gallon - Average











AMHERST ISLANDER II

DAMEN



Globally, **11 million** people work directly or indirectly in the renewable energy sector.

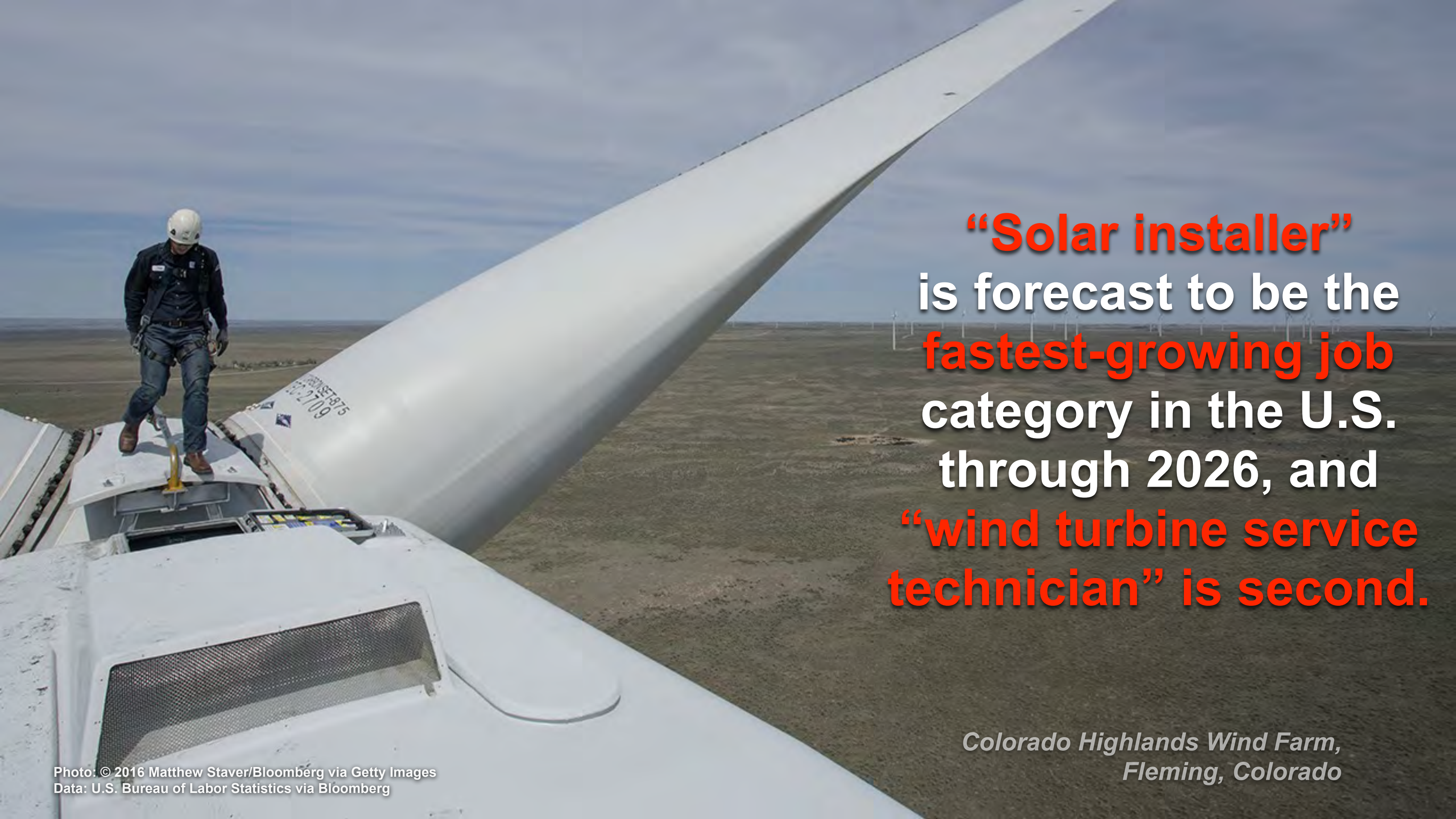


**Over the last five years, U.S.  
solar energy jobs have grown**

**6x**

**faster than the overall economy.**



A photograph of a wind turbine technician standing on a large, white, curved blade of a wind turbine. The technician is wearing a white hard hat, a dark jacket, blue jeans, and brown boots. The background shows a vast, flat, grassy landscape under a clear sky, with other wind turbines visible in the distance. The text is overlaid on the right side of the image.

**“Solar installer”**  
is forecast to be the  
**fastest-growing job**  
category in the U.S.  
through 2026, and  
**“wind turbine service  
technician” is second.**

*Colorado Highlands Wind Farm,  
Fleming, Colorado*





**In the U.S. there are nearly 5 times as many jobs in solar as in coal mining.**



A photograph of a sheep standing behind a wire fence in a grassy field. The image is darkened to serve as a background for the text.

# **Agricultural Revolution**

**Centralized food production led to the emergence of cities and stimulated more rapid population growth**

A close-up photograph of several interlocking metal gears, representing the Industrial Revolution. The image is darkened to serve as a background for the text.

# **Industrial Revolution**

**The invention and use of power-driven machines dramatically increased productivity**

A photograph showing a person's hands holding and interacting with a tablet computer. The image is darkened to serve as a background for the text.

# **Digital Revolution**

**Spread of new information and communications technologies, leading to outsourced production and widespread data consumption**

A photograph of a white wind turbine against a blue sky. The image is darkened to serve as a background for the text.

# **Sustainability Revolution**

**Reorganization of the economy around new forms of zero-emission, healthy, equitable, sustainable growth**



**“Sustainable investing will be a  
core component for how everyone  
invests in the future”**

**Larry Fink, Blackrock  
Chairman & CEO**

**January 10, 2019**



**So...**

**Can we change?**

**Yes!**



**3. Will we change?**



A nighttime photograph of the Eiffel Tower in Paris, France, illuminated with golden lights. The tower stands prominently on the left side of the frame. In the foreground, the Seine River flows, with a small boat carrying people visible in the water. The Parisian skyline, including the Pont de la Concorde and its ornate neoclassical architecture, is visible in the background under a twilight sky.

In the 2015 Paris Agreement,  
**every nation in the world agreed**  
to work together to achieve net zero  
greenhouse gas emissions by mid-century.

The U.S. cannot legally  
withdraw until the day after  
the 2020 Presidential election.



Gujarat, India

China and India  
are **both on track** to  
**overachieve**  
their Paris  
commitments.



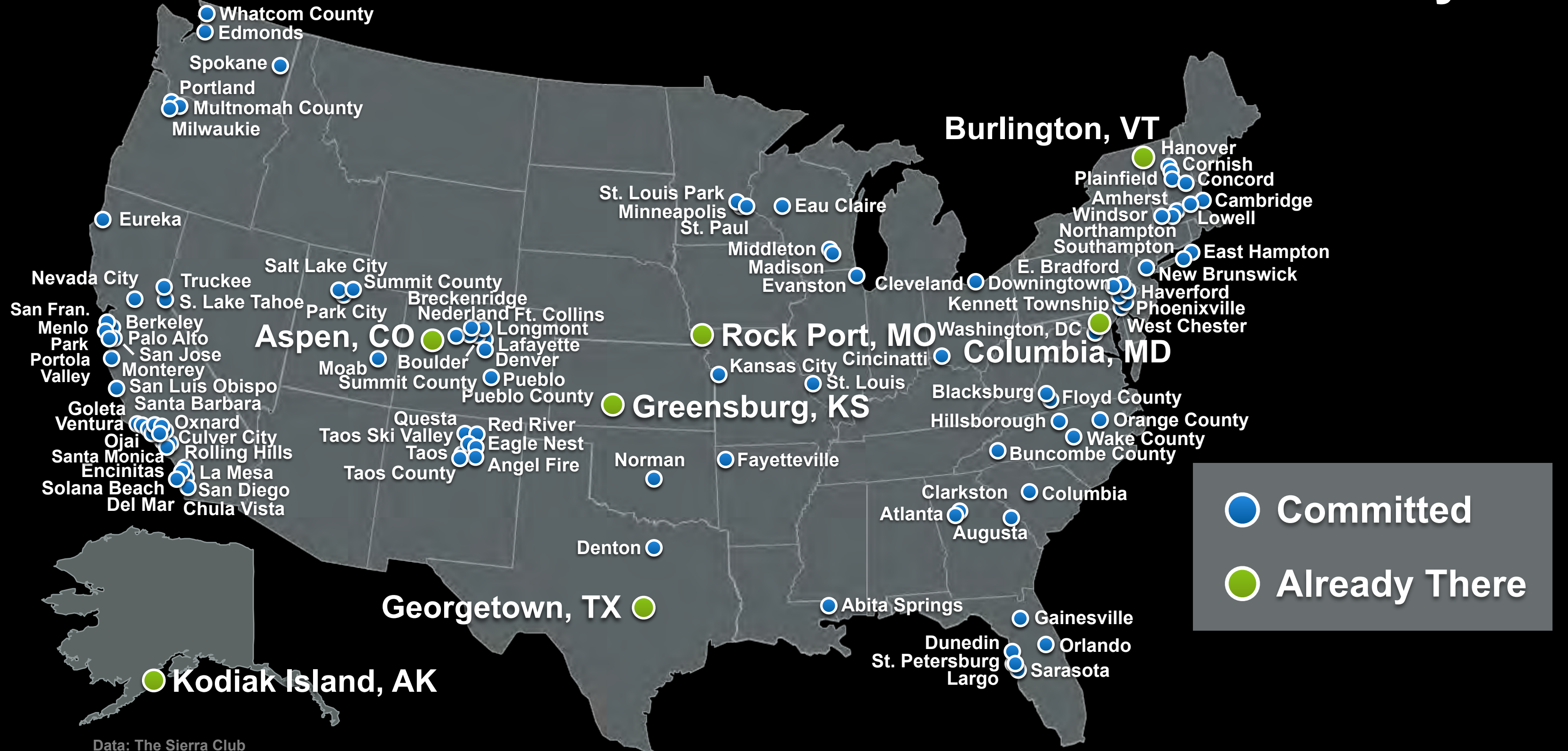
**“We expect  
innovation and global markets,  
rather than politics, to continue to be  
the primary driver  
regardless of who  
for the growth in low-carbon technologies.  
occupies the White House.”**  
In our view,  
prices for batteries and solar panels  
will continue to drop, and global market-share gains  
will continue for wind, solar, EVs and LEDs,

**Goldman Sachs**

November 28, 2016



# U.S. Commitments to 100% Renewable Electricity





In September 2018, California  
—the world's fifth-largest economy—  
passed legislation requiring  
that by 2045, **100%** of the state's  
electricity be **carbon-free**, and the  
governor's office called for the  
**entire state of California**  
to be **carbon-neutral** by 2045.



**In July 2019, New York State  
went California one better by  
signing legislation to have  
100% carbon-free  
electricity by 2040,  
and to achieve  
carbon neutrality by 2050.**



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 | and Puerto Rico |



# U.S. Coal Plants

2005 – 2017



## New Plants

● Proposed  
and Defeated

## Existing Plants

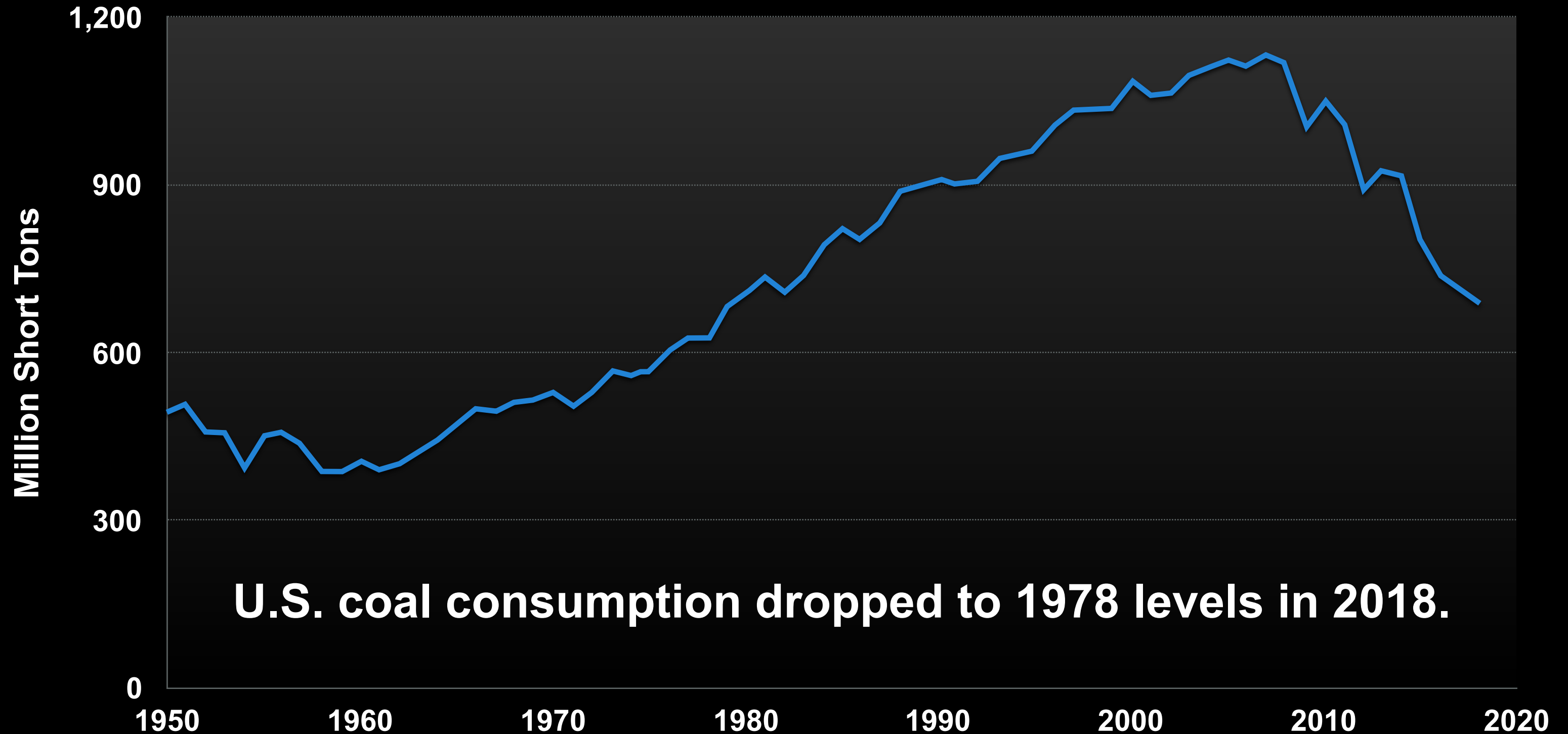
● Retired

● Retirement  
announced



# U.S. Coal Consumption

## 1950 – 2018



**U.S. coal consumption dropped to 1978 levels in 2018.**



30 countries have joined the  
**Powering Past Coal**

alliance, a group dedicated to “taking action to accelerate clean growth and climate protection through the rapid phase-out of traditional coal power.”

Angola

El Salvador

Israel

Marshall Islands

Senegal

**California, New York, and others have joined the alliance at the sub-national level.**

Costa Rica

France

Lithuania

Niue

United Kingdom

Denmark

Ireland

Luxembourg

Portugal

Vanuatu



**112 global financial institutions  
have announced they will stop  
financing coal-fired power plants.**



**112 global financial institutions  
have announced they will stop  
financing coal-fired power plants.**



A large offshore oil rig is being installed in a body of water. Two massive cranes, labeled 'HEEREMA', are lifting the rig's sections. The rig itself is labeled 'THIALF PANAMA R.P.'. In the background, there are mountains and another smaller vessel. The sky is blue with scattered clouds.

Norway's sovereign  
wealth fund has begun  
**divesting**  
from its oil and gas  
investments.



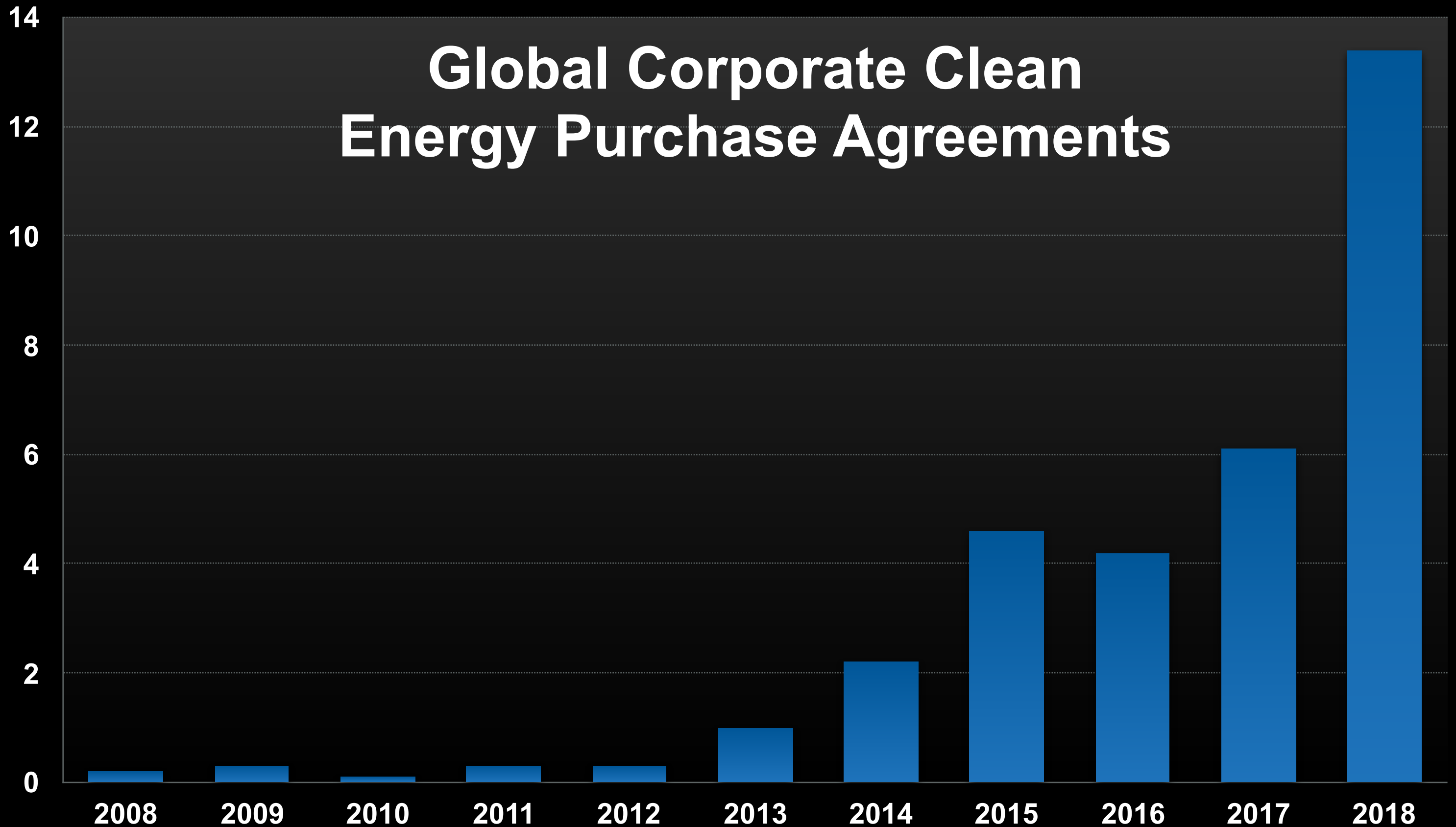


Over 190 global companies have made  
a commitment to go 100% renewable



# Global Corporate Clean Energy Purchase Agreements

Annual Volume (Gigawatts)





**What can I do?**



**“United States innovation and business leadership have been key drivers to lowering our carbon emissions over the last 20 years, and we should continue to have an influential seat at the table as the rest of the world addresses these issues. Withdrawing from the Paris Agreement is misguided, and harms the ongoing effort to fight climate change while also isolating us from our allies.”**

**-Elise Stefanik**

**June 2017**





# Climate Solutions Caucus

[citizensclimatelobby.org](https://citizensclimatelobby.org)

## Senate Republicans

|                                   |
|-----------------------------------|
| <b>Sen. Michael Braun (R-IN)</b>  |
| <b>Sen. Lisa Murkowski (R-AK)</b> |
| <b>Sen. Mitt Romney (R-UT)</b>    |
| <b>Sen. Lindsey Graham (R-SC)</b> |

## Senate Democrats

|                                   |
|-----------------------------------|
| <b>Sen. Chris Coons (D-DE)</b>    |
| <b>Sen. Jeanne Shaheen (D-NH)</b> |
| <b>Sen. Angus King (I-ME)</b>     |
| <b>Sen. Michael Bennet (D-CO)</b> |



# Local

# Research Your Candidates

**VOTER'S EDGE** Get the facts before you vote. [Donate](#)

November 6, 2018 — California General Election

[Election Home](#) [Candidates](#) [Measures](#) [Voting Info](#) [My Choices](#) 0 / 135

## City Council — City of Albany

News and links ▶

### Candidates

You can vote for 2 of these 3 candidates. [COMPARE](#)

**Preston Jordan**  
Engineering geologist

**Top 3 Priorities**

1. Save our lives by requiring seismic retrofit of multifamily...
2. Implement leading **climate** protection policies, such...
3. Improve Albany's economic equity by boosting the percent...

[COMPARE](#) [PROFILE →](#)

**Peggy McQuaid**  
Albany Mayor

**Top 3 Priorities**

1. Strengthen the Albany community through civic engagement...
2. Commit to environmental justice and social equity...
3. Ensure financial stability while making sure community...

[COMPARE](#) [PROFILE →](#)

**Rochelle Nason**  
Vice Mayor of Albany;  
Nonprofit Executive

**Top 3 Priorities**

1. Protect, expand, and improve Albany's parklands, at...
2. Maintain and enhance our Safe Routes to School and...
3. Continue my work on the Alta Bates Task Force, to...

[Take Our Survey](#) [Contact Us](#)

- [VotersEdge.org](https://VotersEdge.org)
- Put in your zip
- Select “Compare Candidates”
- Search the page for “climate.”



# Contact Your Representatives



- **Go to [whoismyrepresentative.com](http://whoismyrepresentative.com)**
- **Put in your zip**
- **Identify contact information**
- **Scan this QR code and edit the content to send a message right now. Or just read the script on a phone call.**

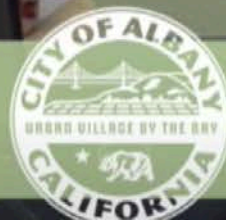
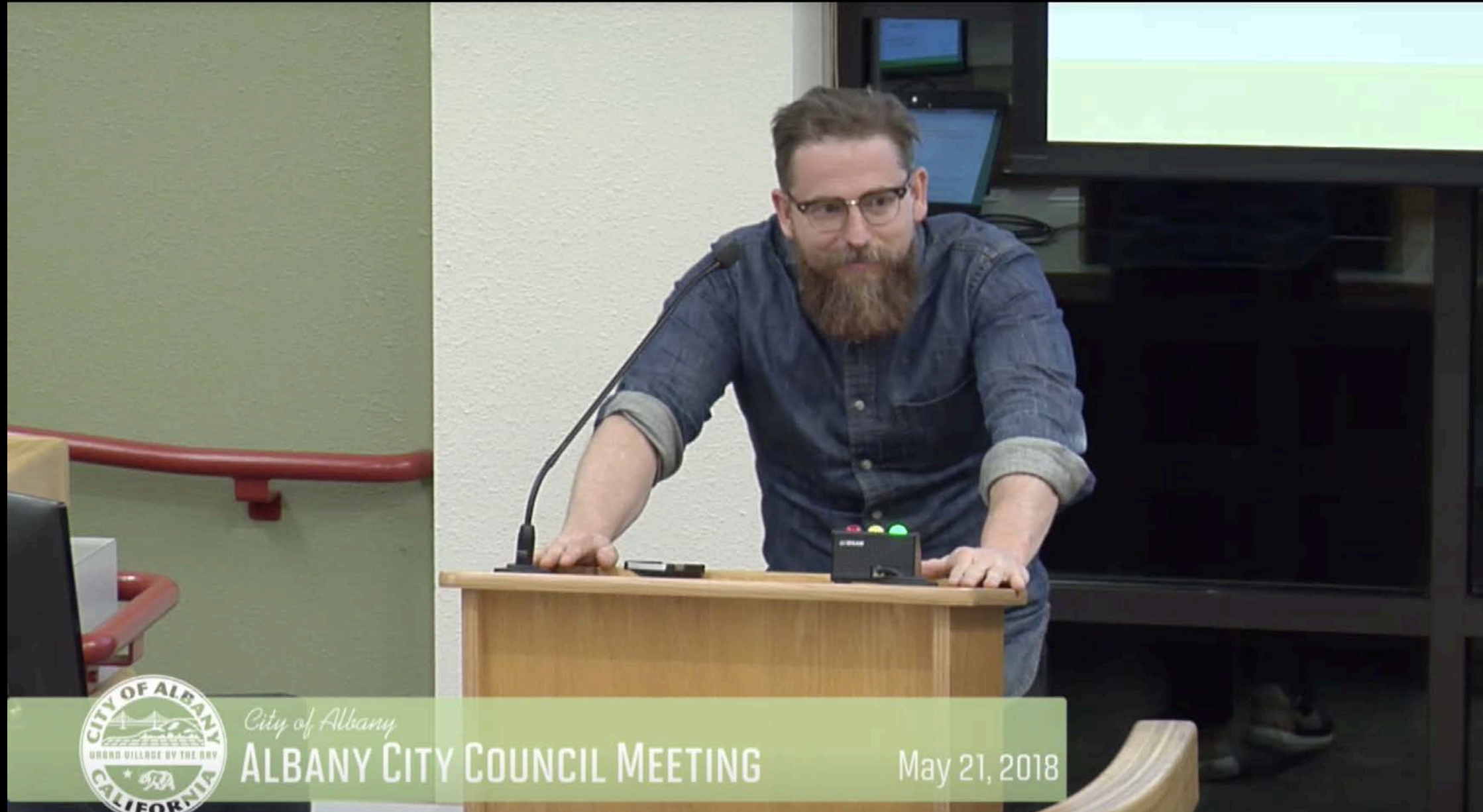


# Host a Climate Action Night





# Give Public Comment



*City of Albany*

**ALBANY CITY COUNCIL MEETING**

May 21, 2018



# Take Personal Action



**Joro is a simple app to track your carbon footprint. Scan the QR code to install the app.**



# Take Personal Action

## Seven Days of Sustainability



### Meatless Mondays

If the entire U.S. skipped meat and cheese just one day a week, it would be the equivalent of taking 7.6 million cars off the road.



### Transit Tuesdays

A single person who switches to public transportation from a private vehicle can reduce his or her annual CO2 emissions by 4,800 pounds per year.



### Walking Wednesday

If everyone in the U.S. stopped driving for a day, we would prevent approximately 3.5 million metric tons of CO2 emissions.



### Thrifty Thursday

If every person in New York City used just one less grocery bag, it would cut waste by 5 million pounds and save \$250,000 in disposal costs.



### Fix-It Friday

Reusing materials and recycling materials can have a huge impact. If everyone recycled just one can, it would reduce green house gas emissions equivalent to taking 6,750 passenger cars off the road.



### Showerless Saturdays

If everyone in the US, just took one less hot shower per year, it would save over 285 billion gallons of water.



### Set Up Sundays

Find new ways to make improvements to your home over time that will make it even more efficient. If every American home switched their five most-used light fittings to energy-saving bulbs, they would reduce greenhouse gases by nearly half a million tons.



When Making a steel angle purlin bases...





# Protest





# **STEAL THESE OFFSETS**

**A climate action toolkit for Startups**



# Engage Others





**Get creative!**





# **Five** Minute Actions

Put a **poster** in your window.

**Call** your representatives.

**Sign** a petition.

**Email** a local leader.



# **Thirty** Minute Actions

**Write** a blog post, letter, or op ed.

**Start** a petition.

**Host** a climate action night.





# Become a Leader

[Climateralityproject.org](https://climateralityproject.org)







**Your world depends on it.**



