COLUMBIA LAW SCHOOL

SABIN CENTER FOR CLIMATE CHANGE LAW

Carbon Pricing and the Future of Energy in New York State

Michael B. Gerrard

Andrew Sabin Professor of Professional Practice

Director, Sabin Center for Climate Change Law

September 2020

Ted Halstead (1968-2020)

CLIMATE LEADERSHIP COUNCIL

THE CONSERVATIVE CASE FOR CARBON DIVIDENDS

How a new climate strategy can strengthen our economy, reduce regulation, help working-class Americans, shrink government & promote national security

James A. Baker, III
Martin Feldstein
Ted Halstead
N. Gregory Mankiw
Henry M. Paulson, Jr.
George P. Shultz
Thomas Stephenson
Rob Walton

February 2017

Summary of carbon dividends plan

1. Gradually rising economy-wide carbon fee: start at \$40/ton CO_2 (2017\$); increase every year 5% above inflation
2. Carbon dividends: return all net proceeds to all US residents with valid Social Security number on an equal basis. Year 1: Family of 4 will receive about \$2,000.
3. Significant regulatory simplification: e.g. displace current and future federal stationary source carbon regulations.
4. Border carbon adjustment: fees on carbon-intensive imports.

As Appeared In

THE WALL STREET JOURNAL.

Economists' Statement on Carbon Dividends

Original Co-Signatories Include

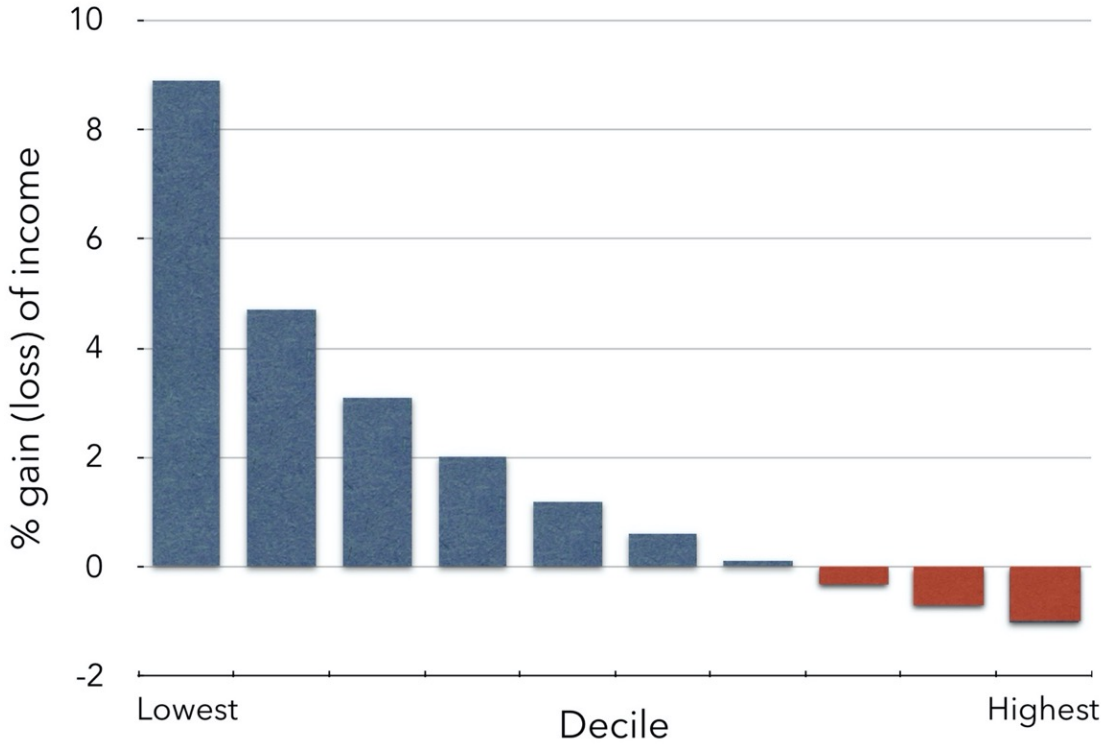
3500+ U.S. Economists

4 Former Chairs of the Federal Reserve

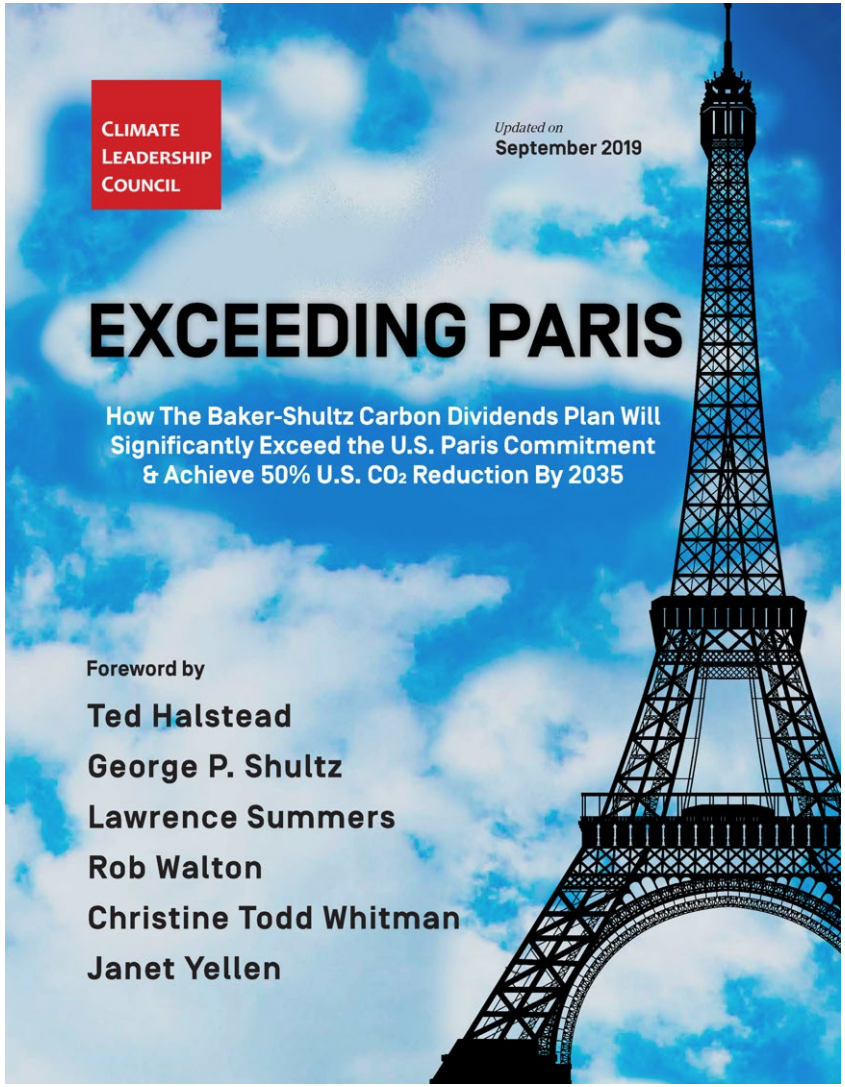
27 Nobel Laureate Economists

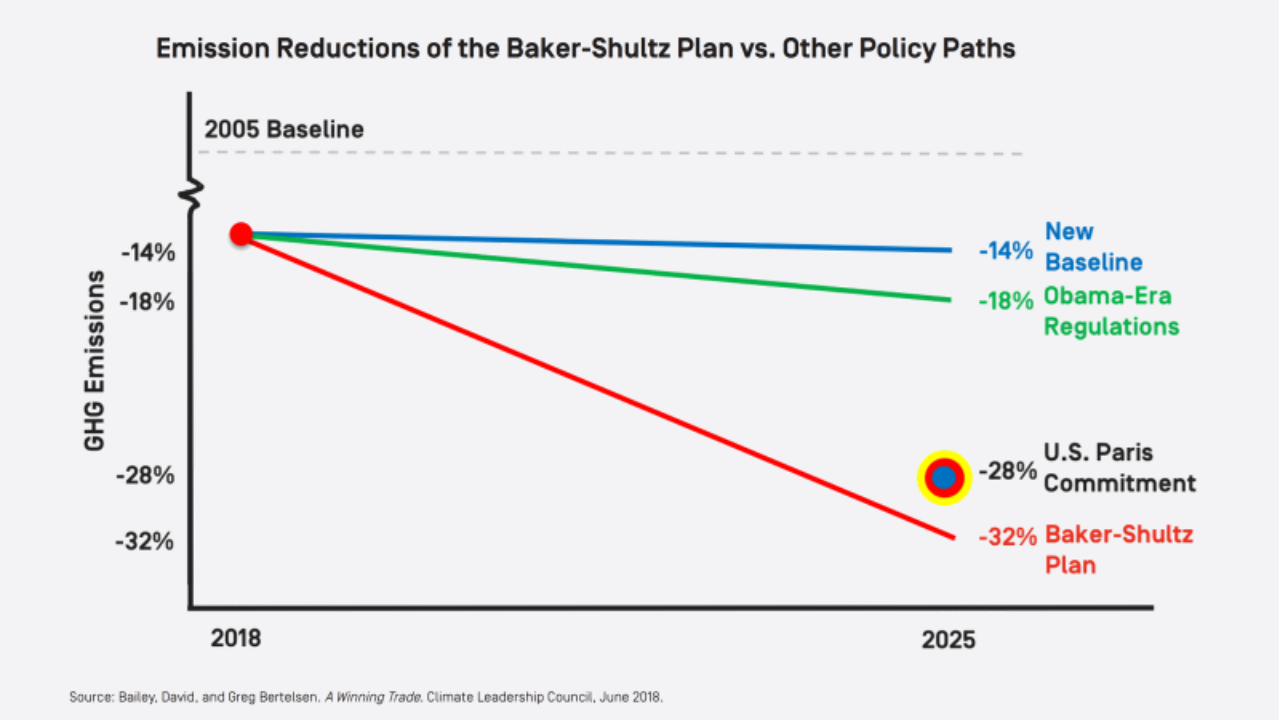
15 Former Chairs of the Council of Economic Advisers

IMPACT OF CARBON DIVIDENDS ON U.S. FAMILY INCOMES

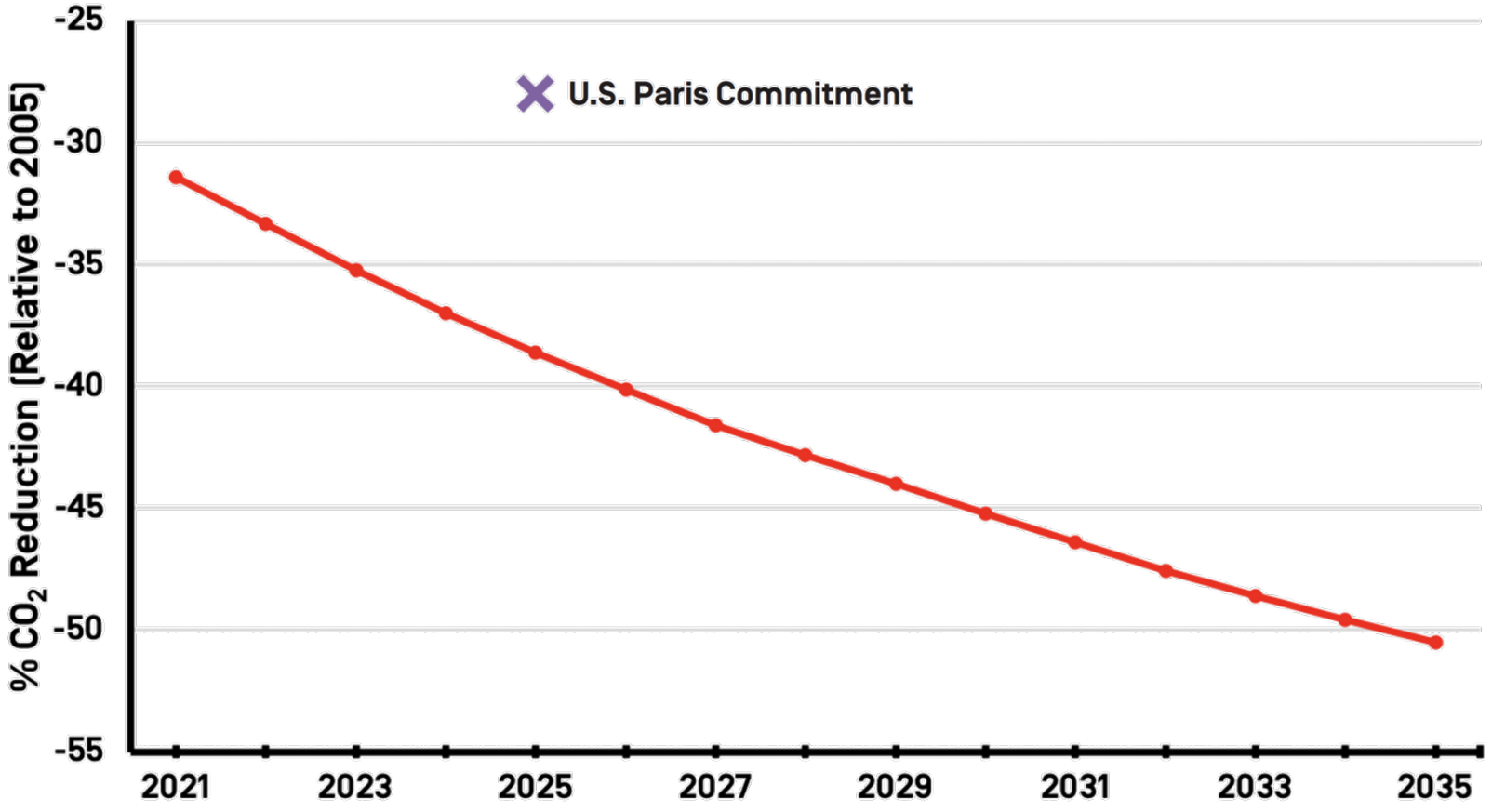


Source: US Treasury, 2017: www.treasury.gov/resource-center/tax-policy/tax-analysis/Documents/WP-115.pdf


CLIMATE
LEADERSHIP
COUNCIL
Updated on
September 2019
EXCEEDING PARIS
How The Baker-Shultz Carbon Dividends Plan Will Significantly Exceed the U.S. Paris Commitment & Achieve 50% U.S. CO_2 Reduction By 2035
Foreword by
Ted Halstead
George P. Shultz
Lawrence Summers
Rob Walton
Christine Todd Whitman
Janet Yellen


Emission Reductions of the Baker-Shultz Plan vs. Other Policy Paths
2005 Baseline
GHG Emissions
-14%
-18%
-28%
-32%
2018
2025
-14% New Baseline
-18% Obama-Era Regulations
-28% U.S. Paris Commitment
-32% Baker-Shultz Plan
Source: Bailey, David, and Greg Bertelsen. A Winning Trade. Climate Leadership Council, June 2018.

Projected CO_2 Reductions from the Baker-Shultz Plan



Source: Hafstead, Marc. "Analysis of Alternative Carbon Tax Price Paths for the CLC Carbon Dividends Plan." *Resources for the Future Issue Brief 18-07.* June 2018. Updated March 2019.

S4CD
STUDENTS FOR CARBON DIVIDENDS

Co-Founded by 100+ Student Groups from Across the Country, including

50+ Conservative Student groups & 50+ Liberal/Environmental Student groups

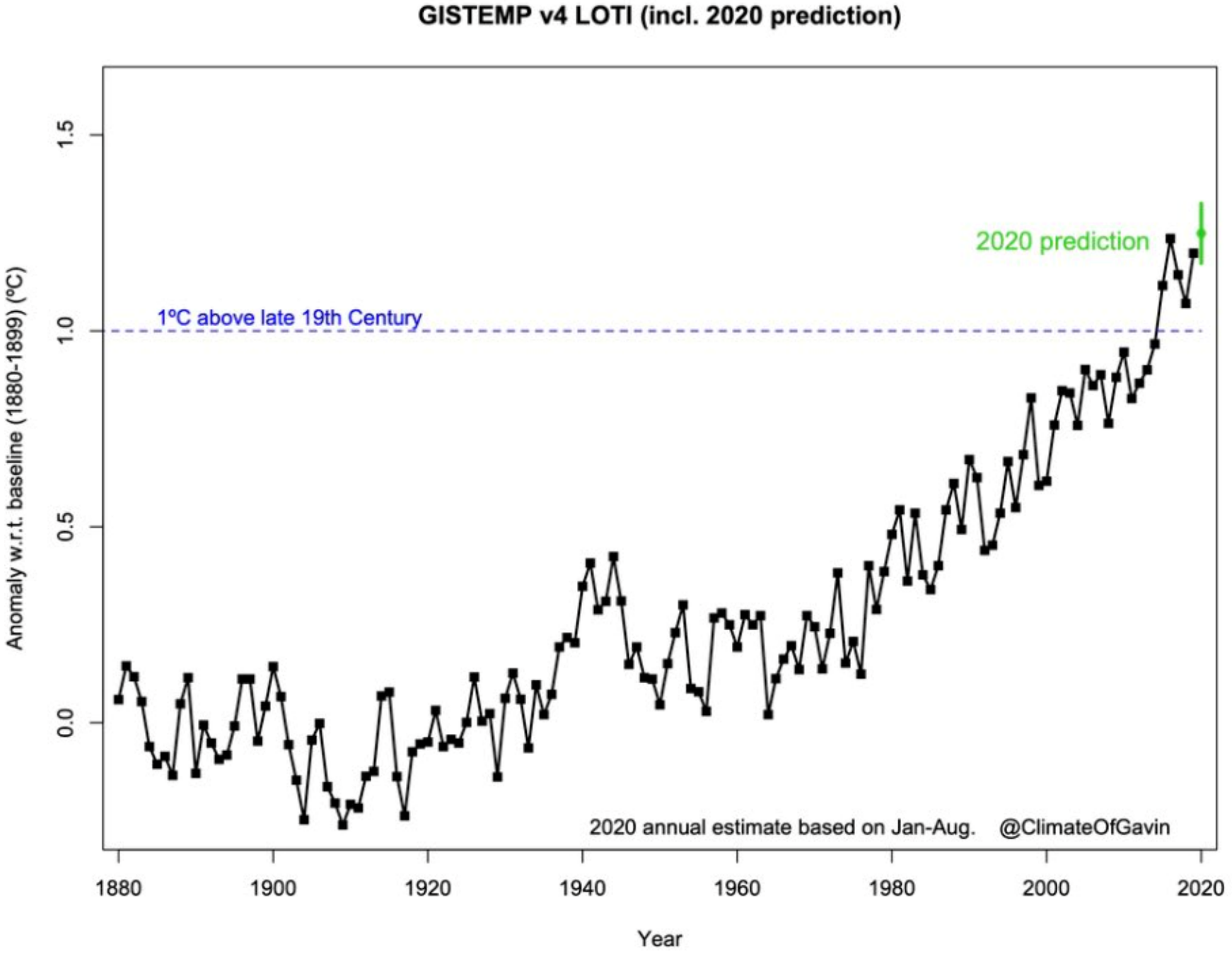
The FIRST TIME a bipartisan student coalition has unified around a national climate solution

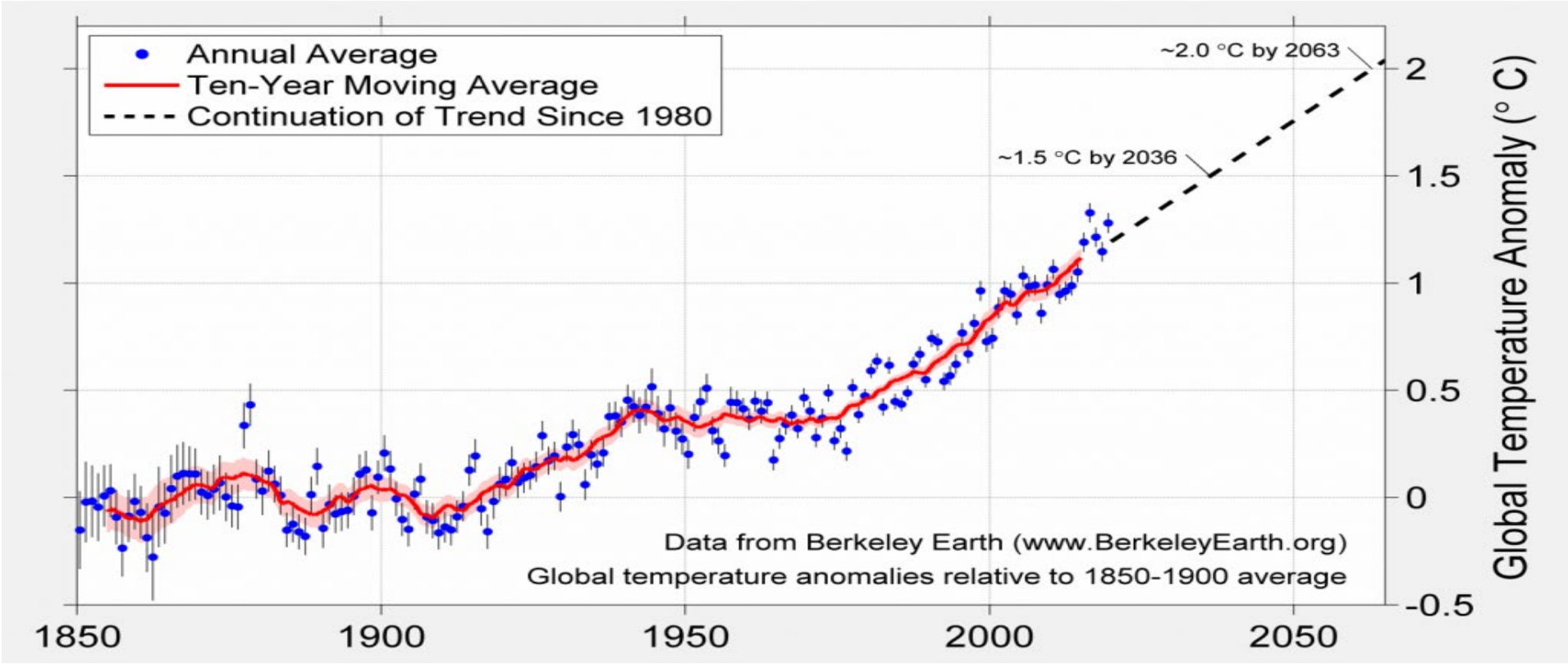
Featured In:

TIME · FOX NEWS channel · CNBC · The Atlantic · THE HILL · The New York Times · AXIOS

www.S4CD.org

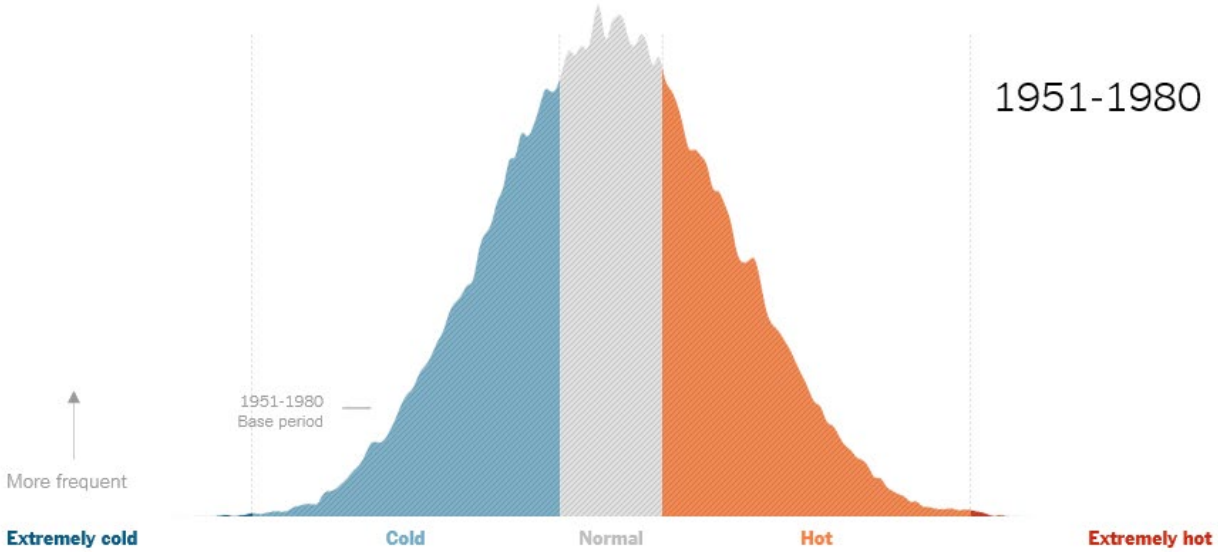

FEDERAL ENERGY
REGULATORY COMMISSION

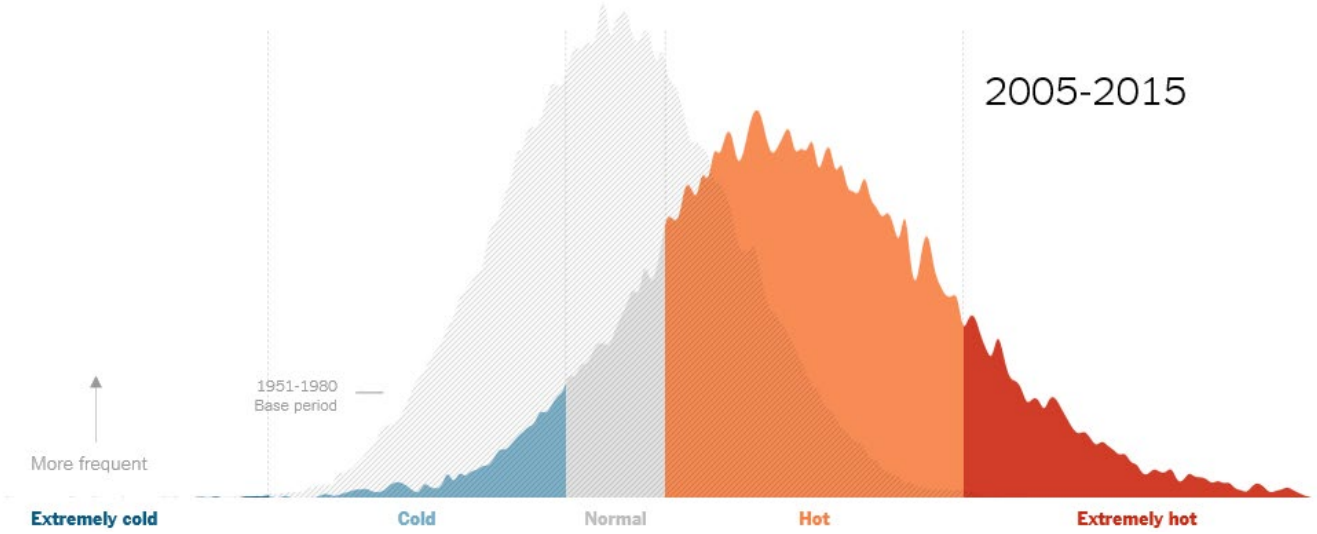

GISTEMP v4 LOTI (incl. 2020 prediction)
Anomaly w.r.t. baseline (1880-1899) (°C)
1.5
1.0
0.5
0.0
2020 prediction
1°C above late 19th Century
2020 annual estimate based on Jan-Aug. @ClimateOfGavin
1880
1900
1920
1940
1960
1980
2000
2020
Year

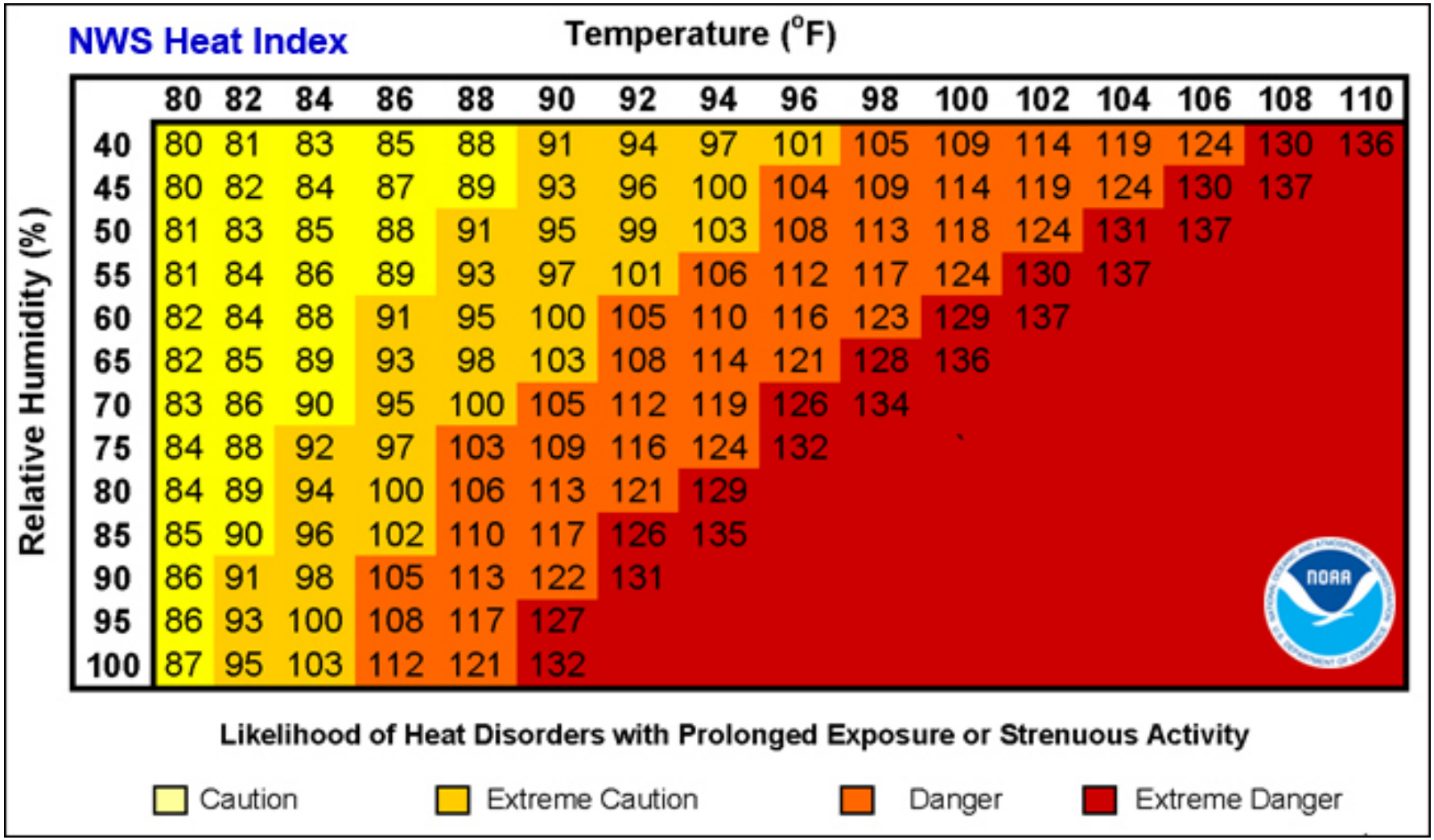

Annual Average
Ten-Year Moving Average
Continuation of Trend Since 1980
~2.0 °C by 2063
~1.5 °C by 2036
Data from Berkeley Earth (www.BerkeleyEarth.org)
Global temperature anomalies relative to 1850-1900 average
Global Temperature Anomaly (° C)
2
1.5
1
0.5
0
-0.5
1850
1900
1950
2000
2050

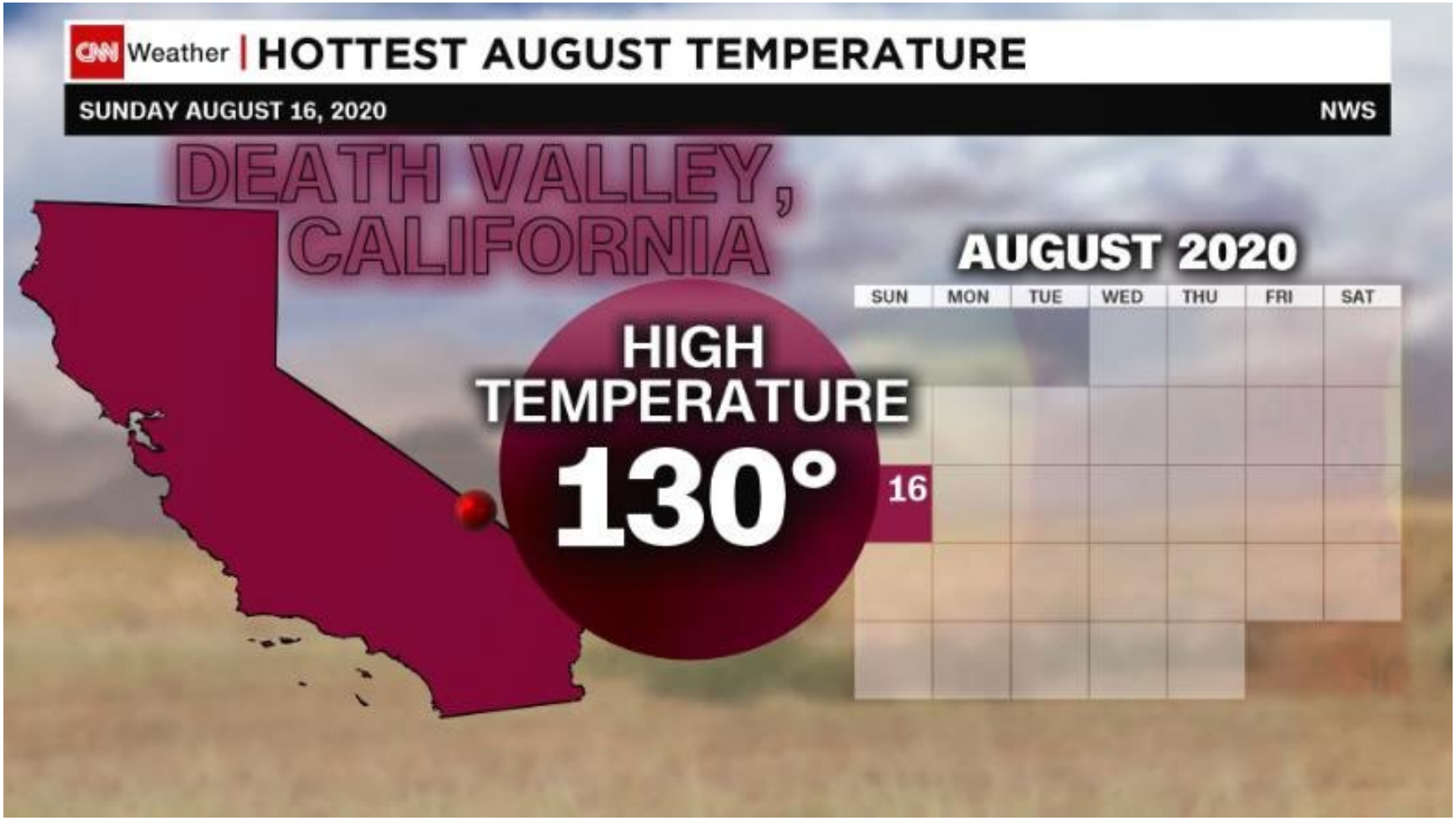
Summer Temperatures in Northern Hemisphere

Source: Nadja Popovich & Adam Pearce, New York Times, July 28, 2017





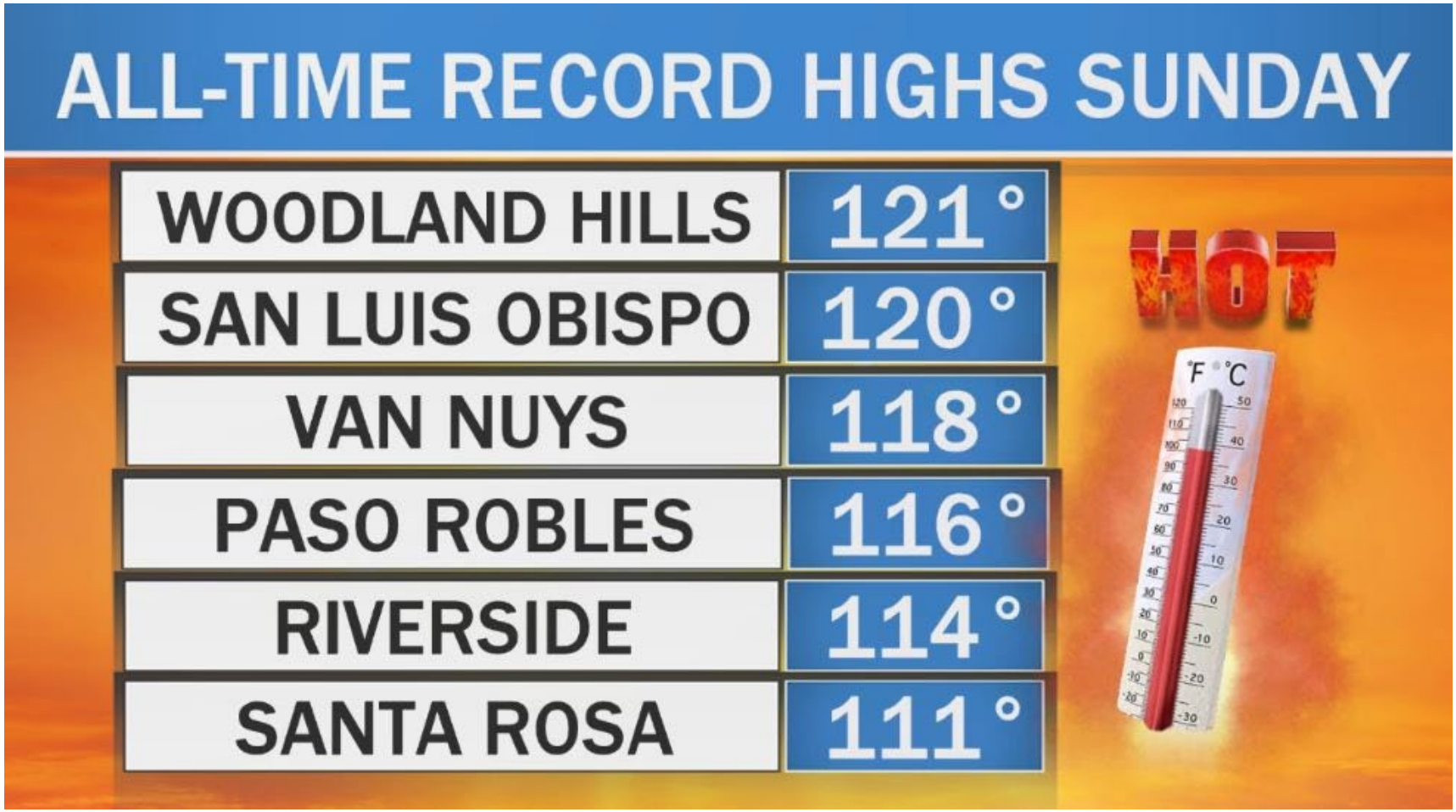

NWS Heat Index
Temperature (°F)
Relative Humidity (%)
80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110
40 80 81 83 85 88 91 94 97 101 105 109 114 119 124 130 136
45 80 82 84 87 89 93 96 100 104 109 114 119 124 130 137
50 81 83 85 88 91 95 99 103 108 113 118 124 131 137
55 81 84 86 89 93 97 101 106 112 117 124 130 137
60 82 84 88 91 95 100 105 110 116 123 129 137
65 82 85 89 93 98 103 108 114 121 128 136
70 83 86 90 95 100 105 112 119 126 134
75 84 88 92 97 103 109 116 124 132
80 84 89 94 100 106 113 121 129
85 85 90 96 102 110 117 126 135
90 86 91 98 105 113 122 131
95 86 93 100 108 117 127
100 87 95 103 112 121 132
NOAA
Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity
Caution
Extreme Caution
Danger
Extreme Danger


CNN Weather | HOTTEST AUGUST TEMPERATURE
SUNDAY AUGUST 16, 2020
NWS
DEATH VALLEY, CALIFORNIA
AUGUST 2020
SUN MON TUE WED THU FRI SAT
16
HIGH TEMPERATURE
130°

July 13, 2020


abc ATM
NATIONAL HIGHS
TODAY
74
Seattle
74
Great Falls
86
Minneapolis
83
Boston
80
Portland
92
Salt Lake City
96
Denver
84
Chicago
80
Detroit
81
New York
90
Kansas City
88
Washington DC
83
Los Angeles
112
Phoenix
97
Albuquerque
103
Dallas
91
Memphis
91
Atlanta
94
New Orleans
92
Miami
66
Anchorage
86
Honolulu

September 6, 2020



ScienceBrief Review

Climate Change Increases the Risk of Wildfires

Matthew W. Jones[1] , Adam Smith[1] , Richard Betts[2, 3], Josep G. Canadell[4] , I. Colin Prentice[5] , and Corinne Le Quéré[1]

1. Tyndall Centre for Climate Change Research, School of Environmental Sciences, University of East Anglia (UEA)
2. Met Office Hadley Centre, Exeter
3. College of Life and Environmental Sciences, University of Exeter
4. CSIRO Oceans and Atmosphere, G.P.O. Box 1700, Canberra, ACT 2601, Australia
5. Department of Life Sciences and Leverhulme Centre for Wildfires, Environment and Society, Imperial College, London

Human-induced climate change promotes the conditions on which wildfires depend, enhancing their likelihood and challenging suppression efforts. Human-induced warming has already led to a global increase in the frequency and severity of fire weather, increasing the risks of wildfire. This signal has emerged from natural variability in many regions, including the western US and Canada, southern Europe, Scandinavia and Amazonia. Human-induced warming is also increasing fire risks in other regions, including Siberia and Australia. Nonetheless, wildfire activity is determined by a range of other factors includ- ing land management and ignition sources, and on the global-scale most datasets indicate a reduction in burned area in recent years, chiefly due to clearing of natural land for agriculture.

All references visible on ScienceBrief here

Background. The Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) published in 2013 identified several climate trends that have the potential to influence fire weather:

- Global increases in average temperature.
- Global increases in the frequency, intensity and/or extent of heatwaves (i.e. the breaching of historically extreme temperature thresholds).
- Regional increases in the frequency, duration and intensity of drought.

Fire weather used here refers to periods with a high likelihood of fire due to a combination of high temperatures, low humidity, low rainfall and often high winds. Rising global temperatures and more frequent heatwaves and associated droughts increase the likelihood of wildfire by promoting hot and dry conditions, which are conducive to fire weather. Changes in rainfall and its seasonality complicate trends in fire weather, and so reductions in fire weather are possible in some regions. Nonetheless, wildfire occurrence is moderated by a range of factors including land management practises, land-use change and ignition sources. At the

Sunday
Los Angeles Times
$3.00 DESIGNATED AREAS HIGHER © 2020 SUNDAY, SEPTEMBER 13, 2020
latimes.com

California's climate apocalypse

Fires, heat, air pollution: The calamity is no longer in the future — it's here, now

Oregon residents standing ground

By Richard Read, Molly Hennessy-Fiske and Melissa Etehad

MOLALLA, Ore. — Christine VanOeveren grabbed a bucket Saturday and lugged water from a neighbor's swimming pool to douse embers from a wildfire that threatened to merge with another blaze to cover an area as big as Los Angeles.

The 45-year-old mother of two and her husband, John, had helped beat back flames Friday that came within 500 yards of their house 45 miles south of Portland, Ore. On Saturday, after clearing ash from their roof, they joined neighbors dousing hot spots at a nearby home.

The VanOeverens were among thousands of Oregon residents who, despite warnings from state officials to evacuate, have sought to de-

[See Oregon, A11]

John Locher Associated Press

GEORGE COBLE surveys his fire-ravaged property in Mill City, Ore. With a shortage of fire crews, thousands of Oregonians are pitching in rather than evacuate. Officials believe they're facing a "mass fatality incident."

A bleak search for the missing

Hunt is underway for survivors or remains. At least 12 are dead, but the true toll won't be known for days.

By Ruben Vives and Alex Wigglesworth

OROVILLE, Calif. — Every Wednesday afternoon, Mark Holder would get on the phone from his home in Tennessee and call his brother Larry Holder in Berry Creek in the mountains of Butte County.

Cellphone reception was spotty in the mountains so

Sea of tall matches fills forests in Sierra

By Bettina Boxall

Two years ago scientists warned that a massive tree die-off in the Sierra Nevada could set the stage for forest conflagrations akin to World War II fire bombings.

The Creek fire, which

By Susanne Rust and Tony Barboza

In 2008, a team of international scientists projected that during the next 100 years, the planet's inhabitants would witness higher maximum temperatures, more hot days and heat waves, an increase in the risk of forest fires and "substantially degraded air quality" in large metropolitan areas as a result of climate change.

In just the past month, nearly two decades after the third United Nations Intergovernmental Panel on Climate Change report was issued, heat records were busted across California, more than 3 million acres of land burned, and air pollution has skyrocketed in major metropolitan areas such as Los Angeles and San Francisco.

"This shouldn't come as a surprise to anyone," said Michael Gerrard, director of the Sabin Center for Climate Change Law at Columbia University. "Maybe we underestimated the magnitude and speed" at which these events would occur, he said, but "we've seen this long freight train barreling down on us for decades, and now the locomotive is on top of us, with no caboose in sight."

In a matter of weeks, California has experienced six of the 20 largest wildfires in the state's modern history and toppled all-time temperature records from the desert to the coast.

Millions are suffering from some of the worst air quality in years due to heat-triggered smog and fire smoke. A sooty plume has blanketed most of the West Coast, blotting out the sun and threatening people's lungs during a deadly pandemic.

California is being pushed to extremes. And the record heat, fires and pollution all have one thing in common: They were made worse by climate change. Their convergence is perhaps the strongest signal yet that the calamity climate scientists have warned of for years isn't far off in the

JOSH EDELSON Associated Press

rtage of fire crews, thousands
g a "mass fatality incident."

missing

Hunt is underway for survivors or remains.

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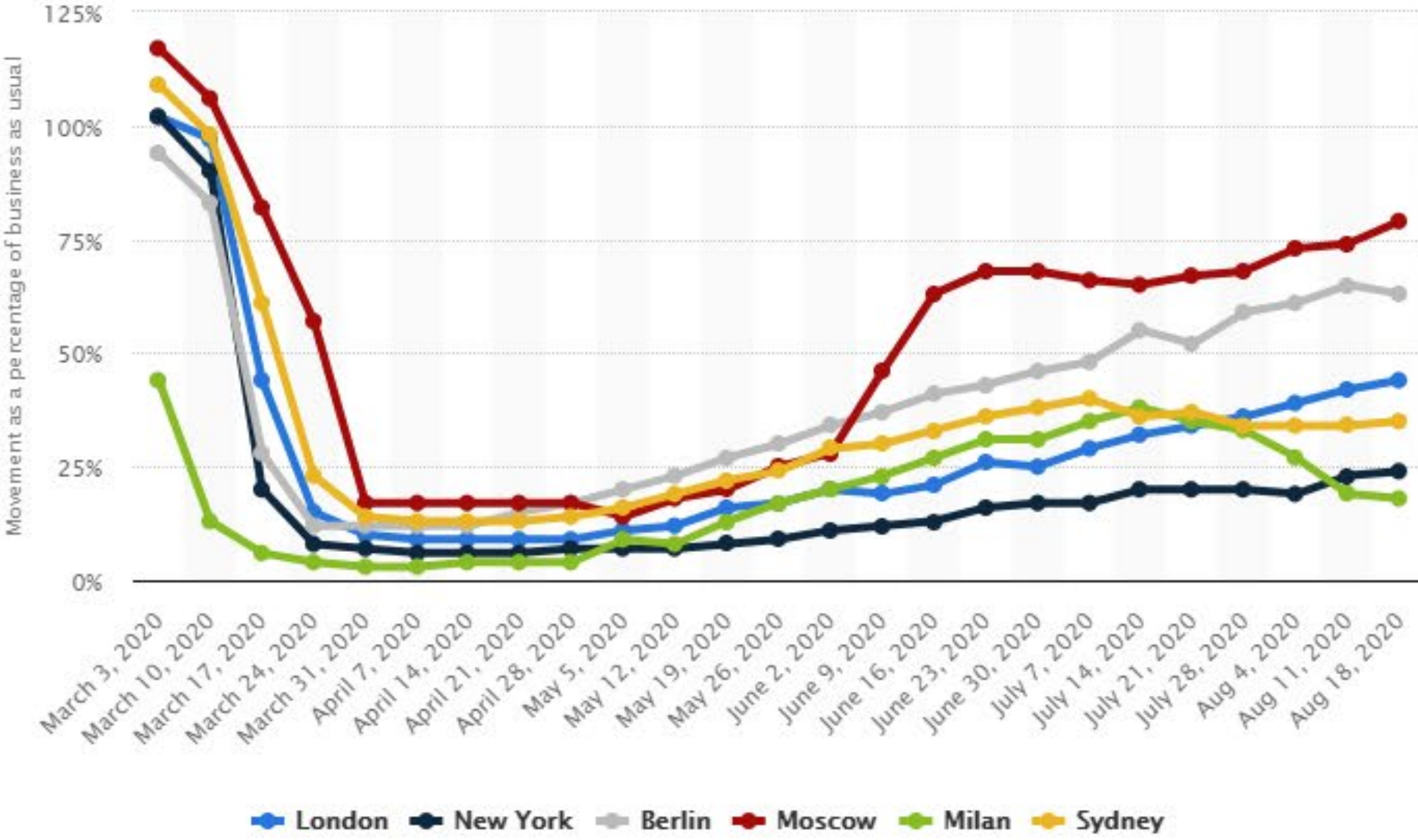
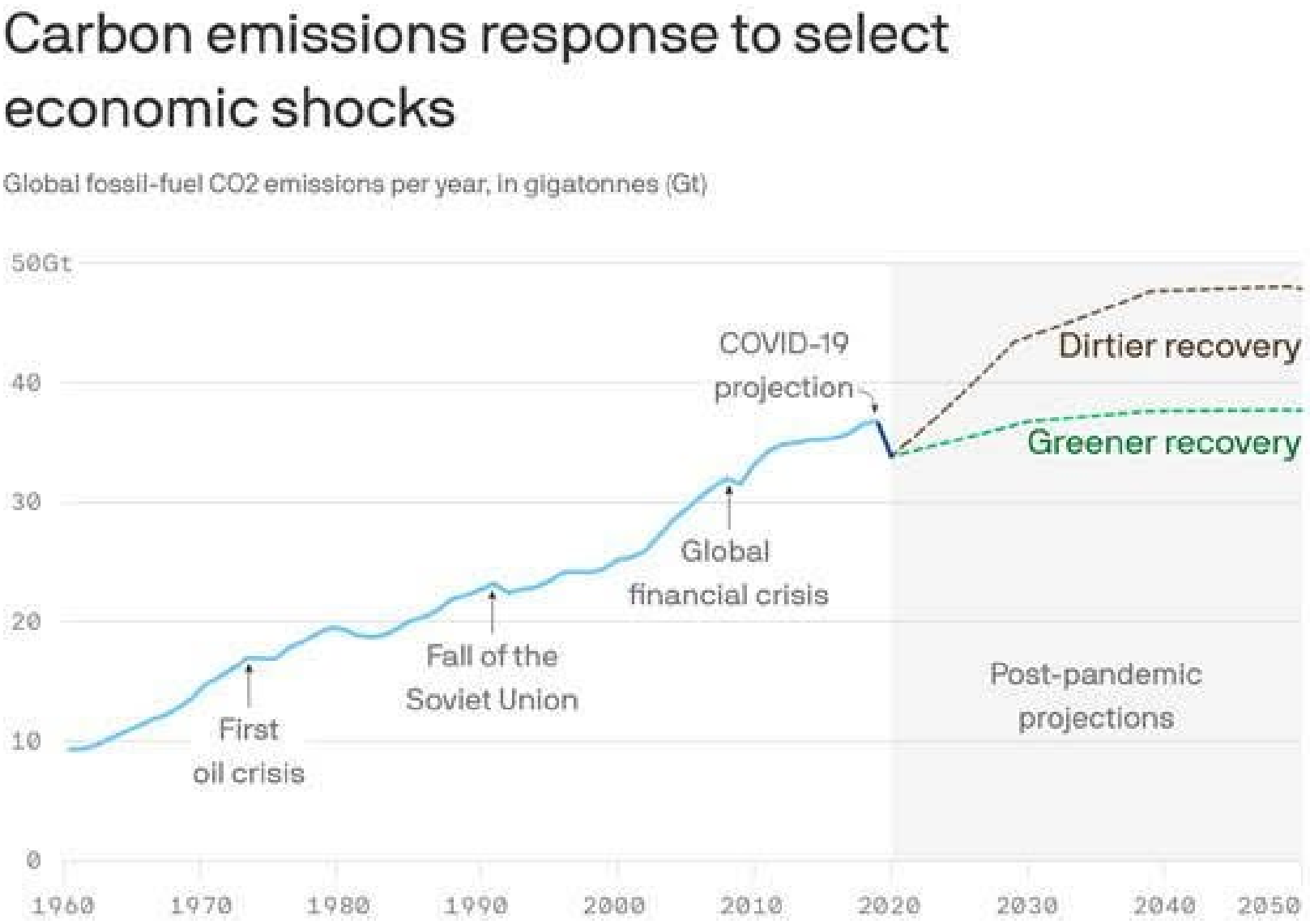
Millions are suffering from some of the worst air

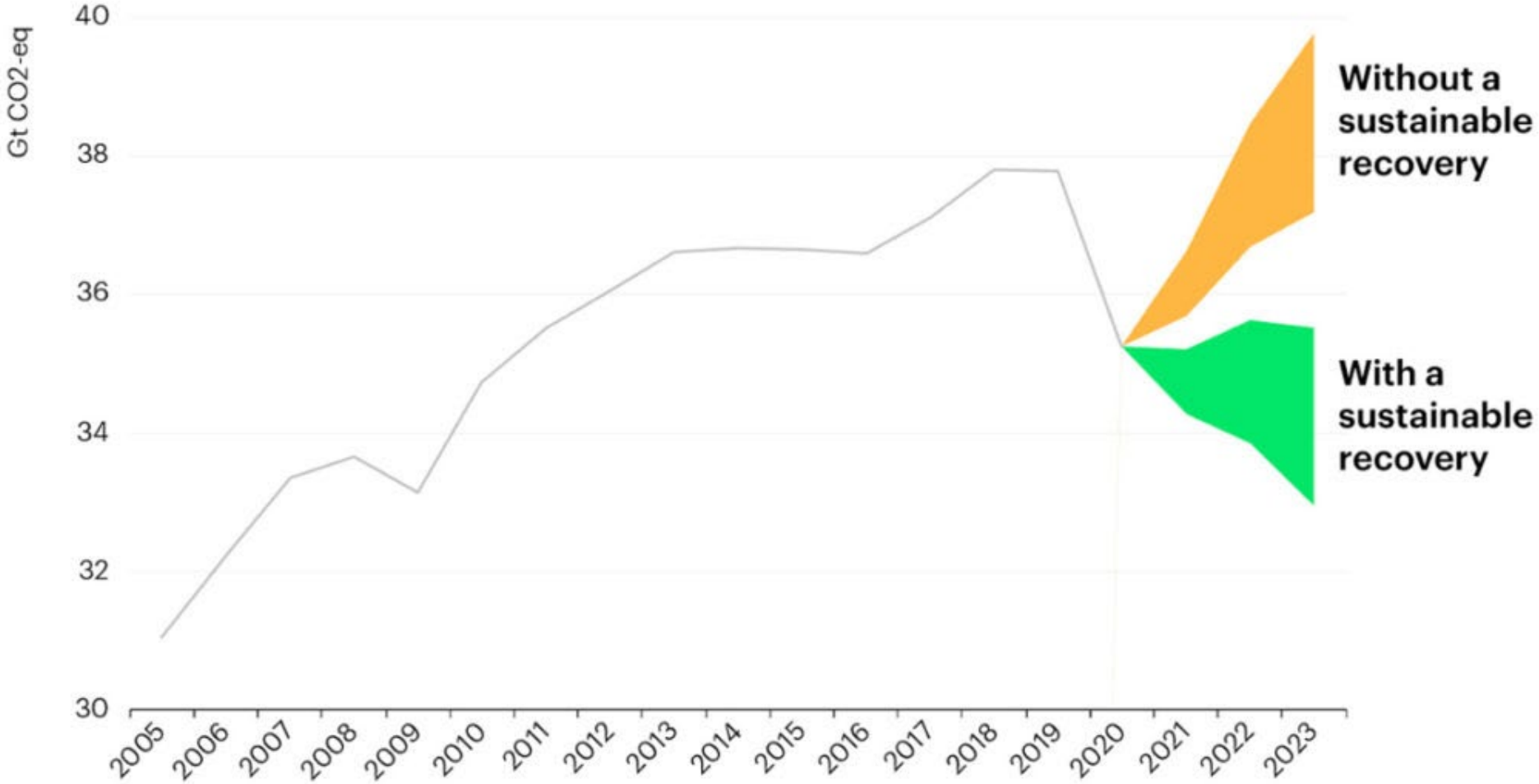


Additional Information

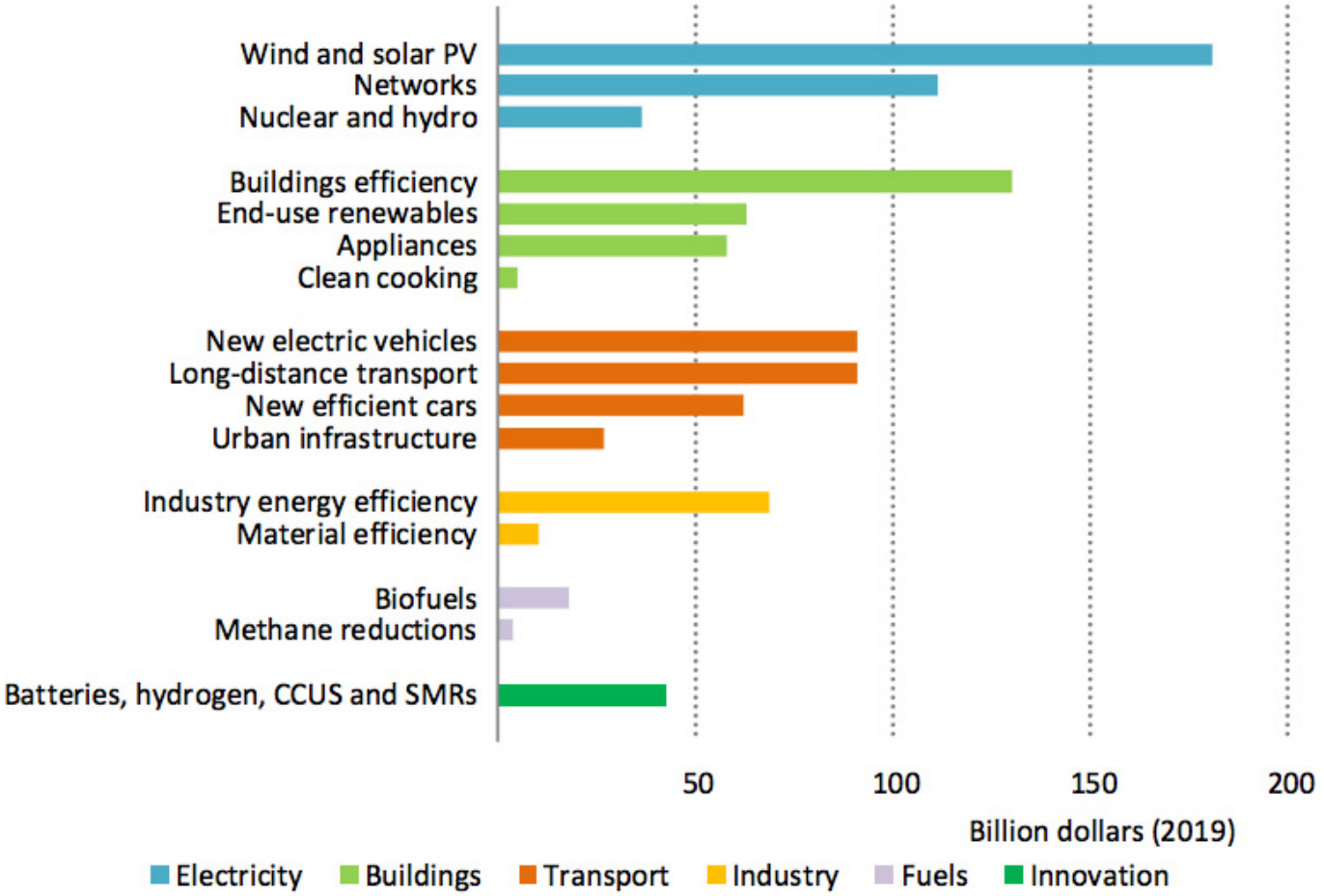
Show s

Ryan Hanna et al., After COVID-19, green investment must deliver jobs to get political traction, *Nature*, June 9, 2020. Graphic: Danielle Alberti/Axios



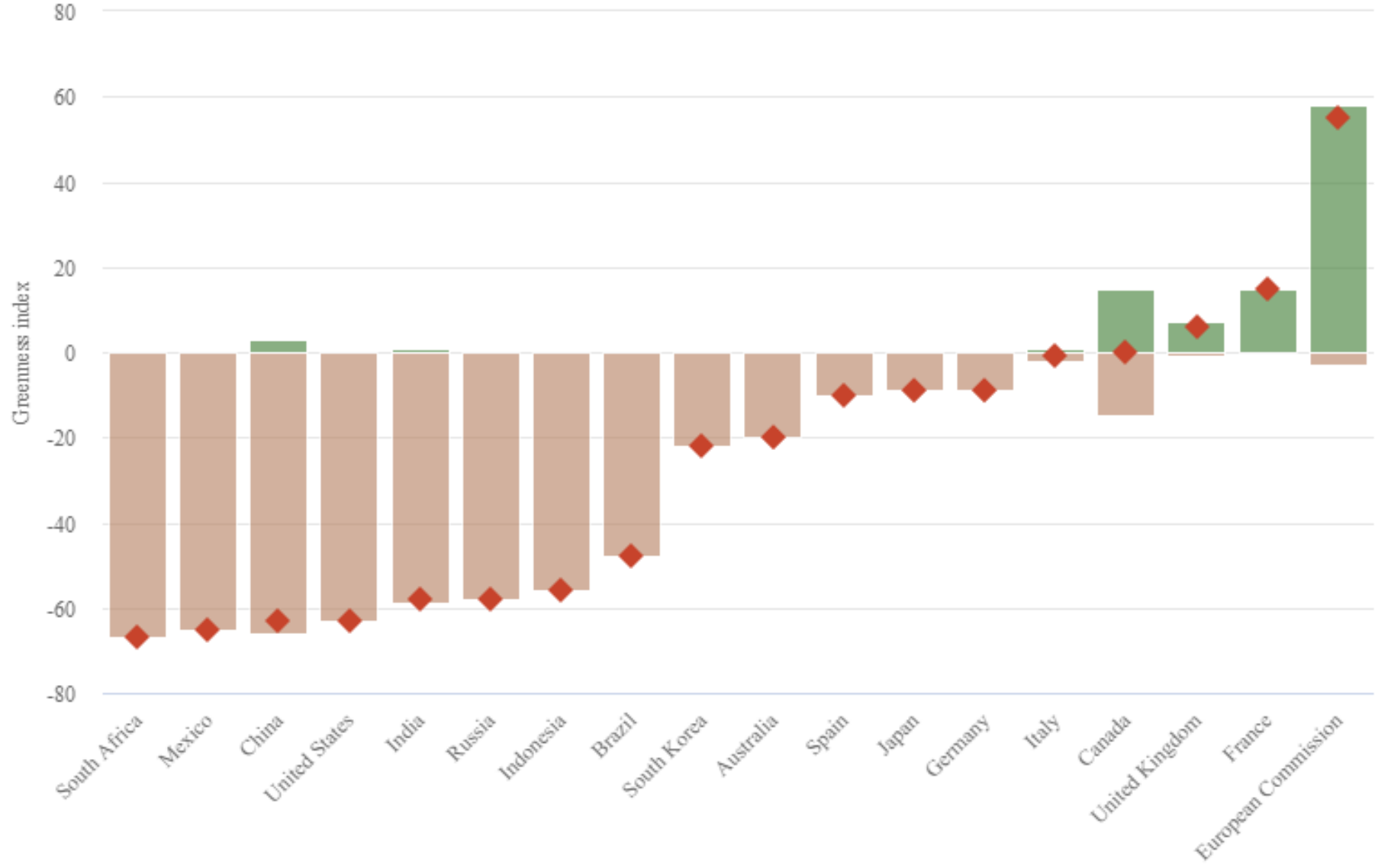

Gt CO2-eq
40
38
36
34
32
30
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Without a sustainable recovery
With a sustainable recovery

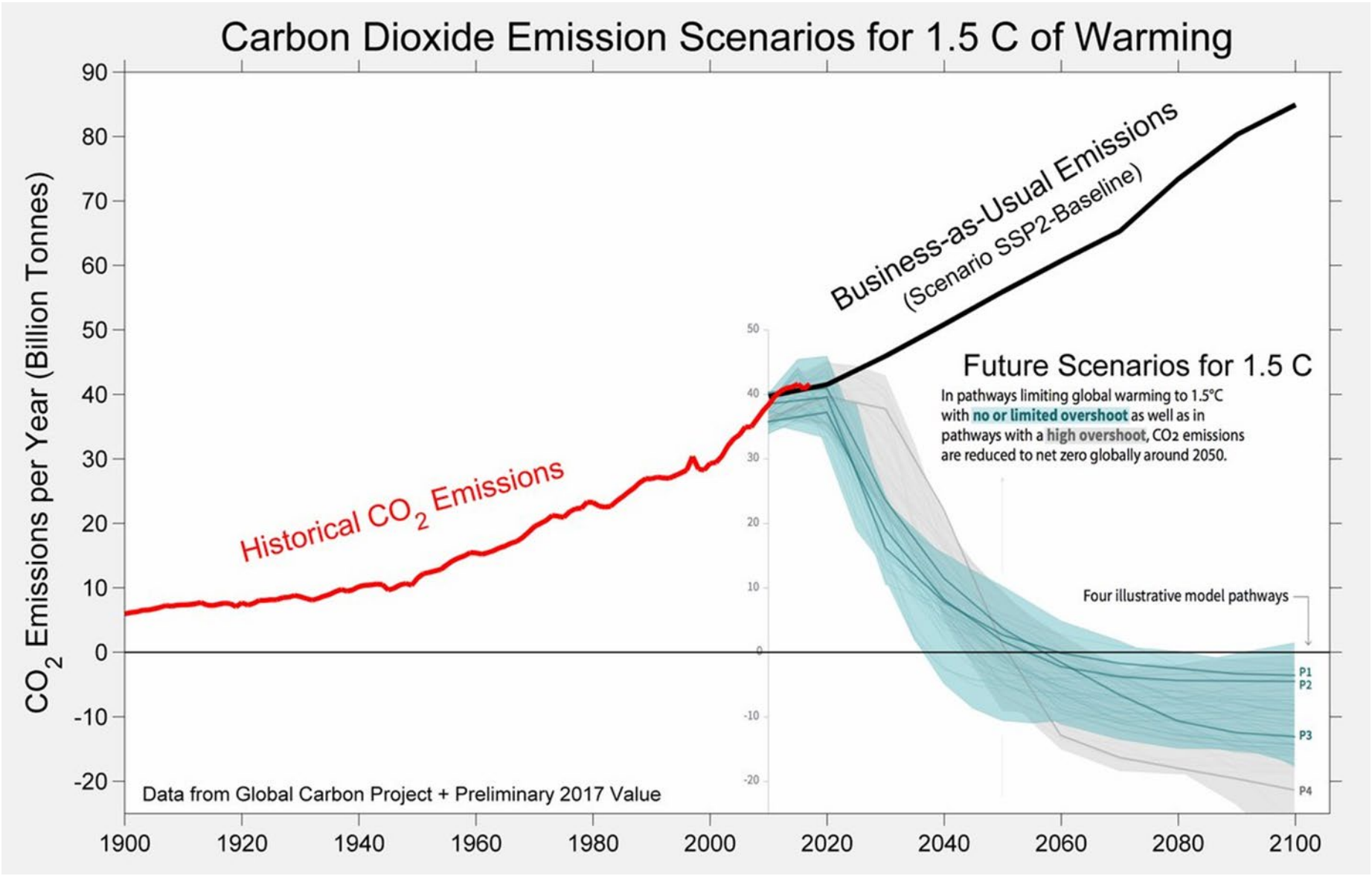
Global average annual spending by sector under sustainable recovery plan (International Energy Agency)



'Potentially damaging' stimulus measures dominate so far, according to Vivid Economics

The **overall ratings** in Vivid's "Green Stimulus Index" are dominated by measures it rates as **"brown"** rather than **"green"**




Carbon Dioxide Emission Scenarios for 1.5 C of Warming
CO_2 Emissions per Year (Billion Tonnes)
90
80
70
60
50
40
30
20
10
0
-10
-20
1900
1920
1940
1960
1980
2000
2020
2040
2060
2080
2100
Historical CO_2 Emissions
Business-as-Usual Emissions
(Scenario SSP2-Baseline)
Future Scenarios for 1.5 C
In pathways limiting global warming to 1.5°C with no or limited overshoot as well as in pathways with a high overshoot, CO_2 emissions are reduced to net zero globally around 2050.
Four illustrative model pathways
P1
P2
P3
P4
Data from Global Carbon Project + Preliminary 2017 Value

SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

IDDRI
SciencesPo.

- Deep Decarbonization Pathways Project
  - National blueprints for limiting warming to 2°C
  - Moving from incrementalism to transformation
  - Independent research teams from 16 countries
  - 3/4 of current CO_2 emissions
  - OECD, China, India, Brazil, South Africa, Mexico

SCIENCE

A Path for Climate Change, Beyond Paris

By JUSTIN GILLIS DEC. 1, 2015

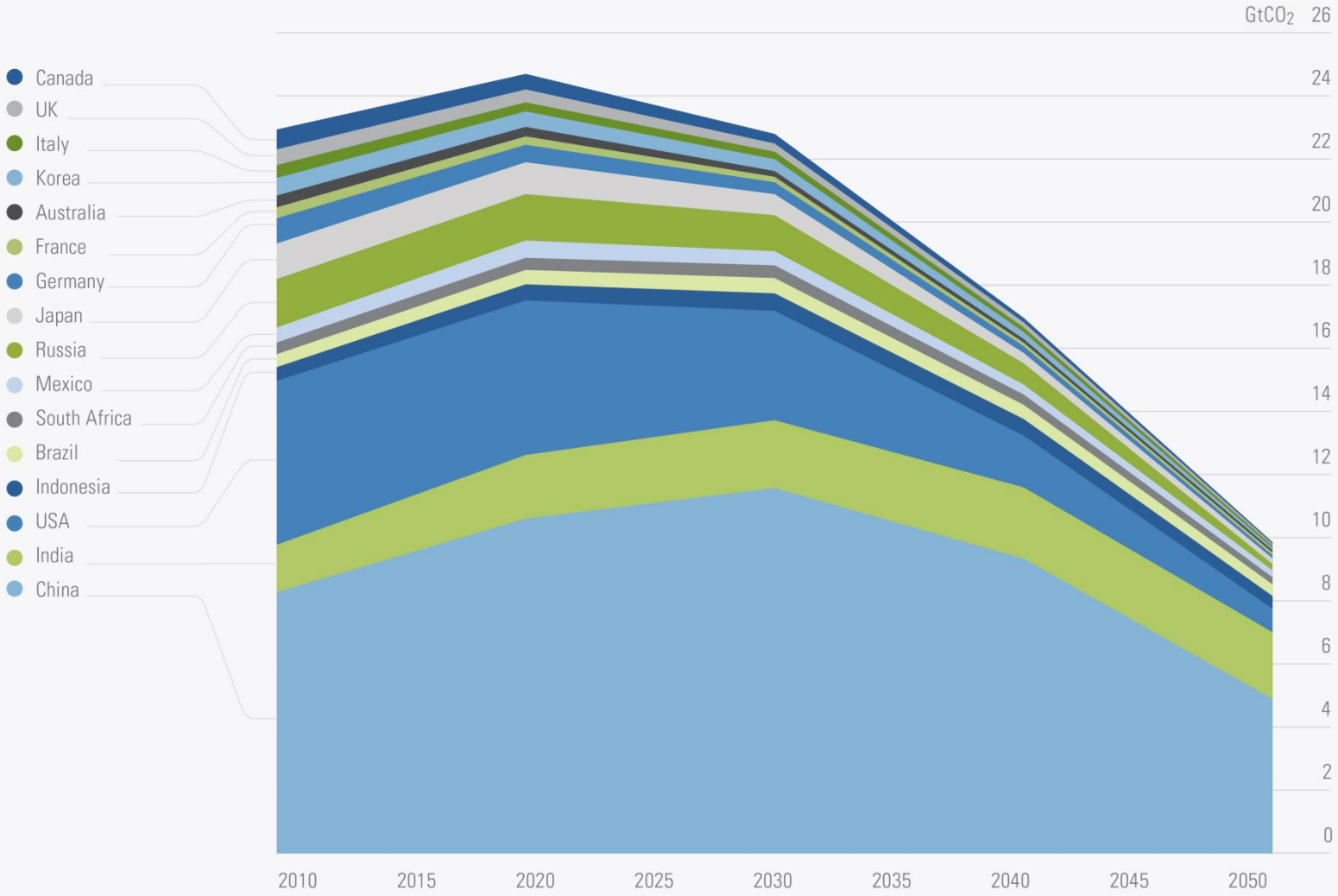
UN issued with roadmap on how to avoid climate catastrophe

Report is the first of its kind to prescribe concrete actions that the biggest 15 economies must take to keep warming below 2C

29

DDPP Aggregate Emissions

Figure 1. Emissions trajectories for energy CO_2, 2010-2050, showing most ambitious reduction scenarios for all DDPP countries. 2050 aggregate emissions are 57% below 2010 levels.



Four Pillars of a Net-Zero or Net-Negative Energy System

U.S. Benchmarks

Electricity Decarbonization

95% reduction in emissions intensity

Energy Efficiency

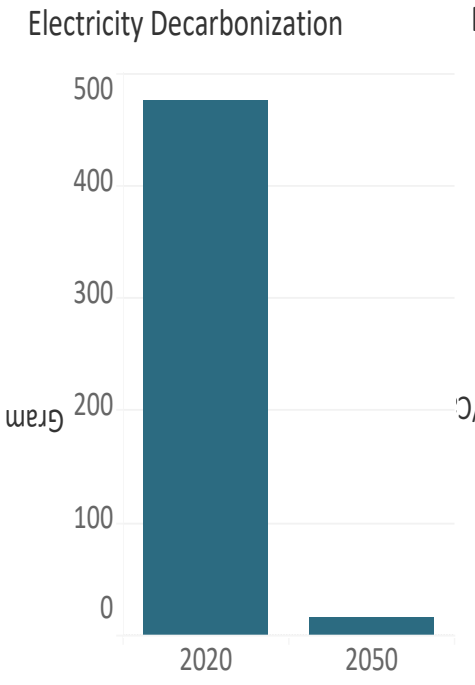
40% reduction in per-capita final energy demand

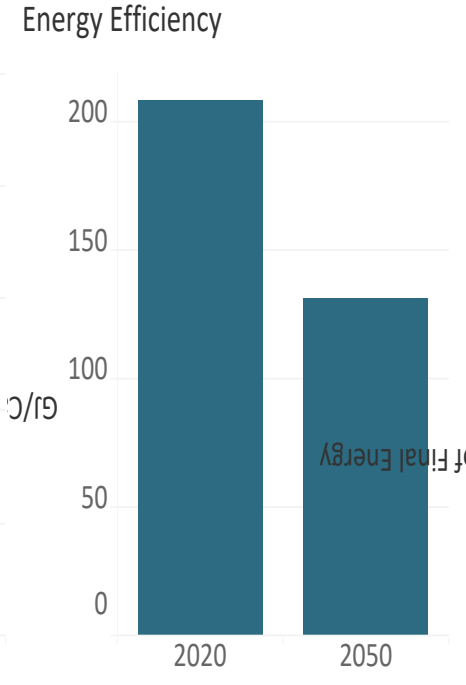
Electrification

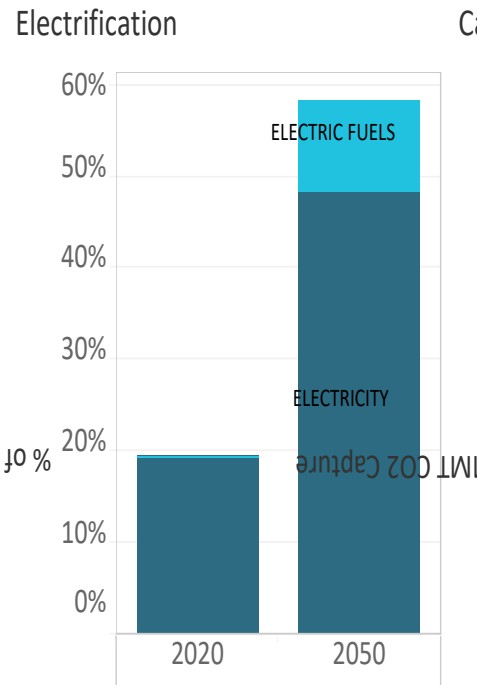
300% increase in share of energy from electricity

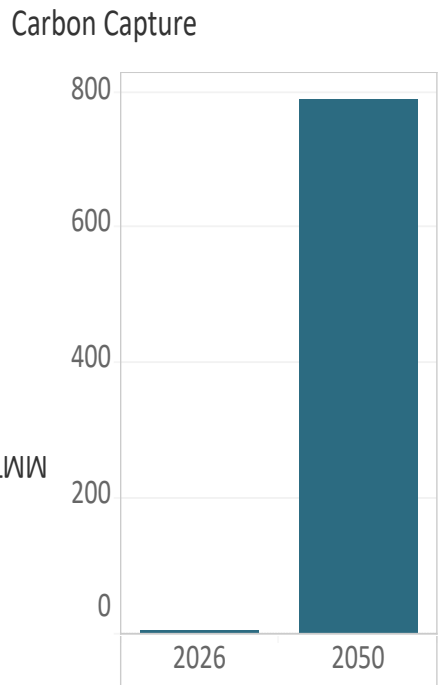
Carbon Capture

800 MMT+ carbon capture and use/storage

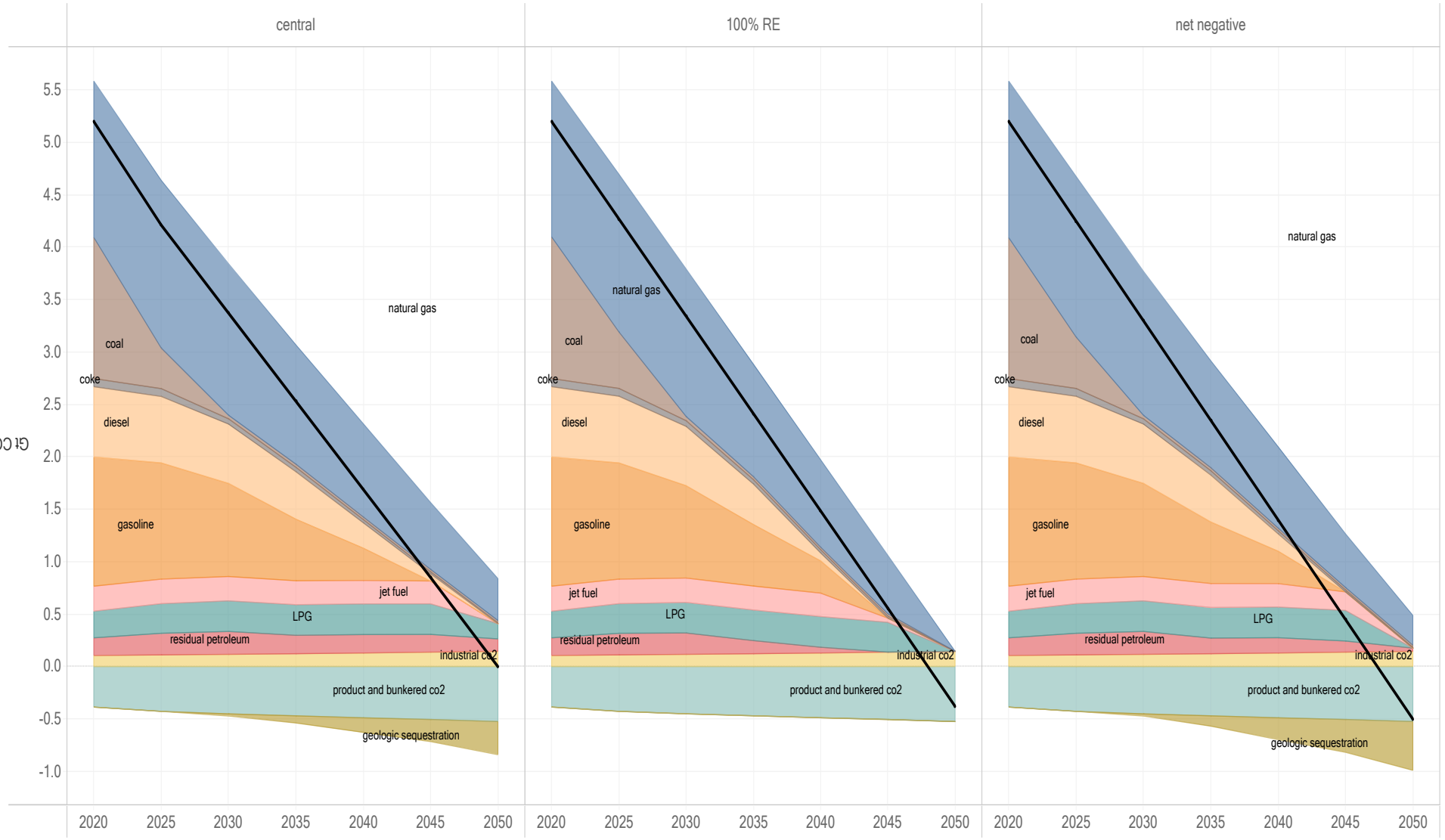






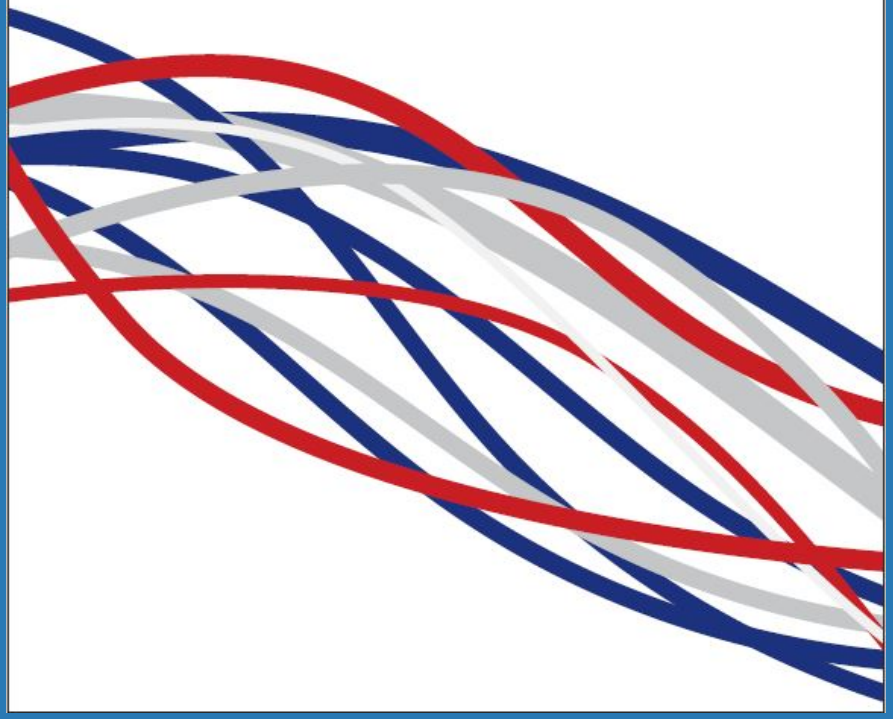


Annual emissions trajectory – central, 100% RE, net negative



LEGAL PATHWAYS TO DEEP DECARBONIZATION IN THE UNITED STATES

MICHAEL B. GERRARD AND **JOHN C. DERNBACH**, EDITORS



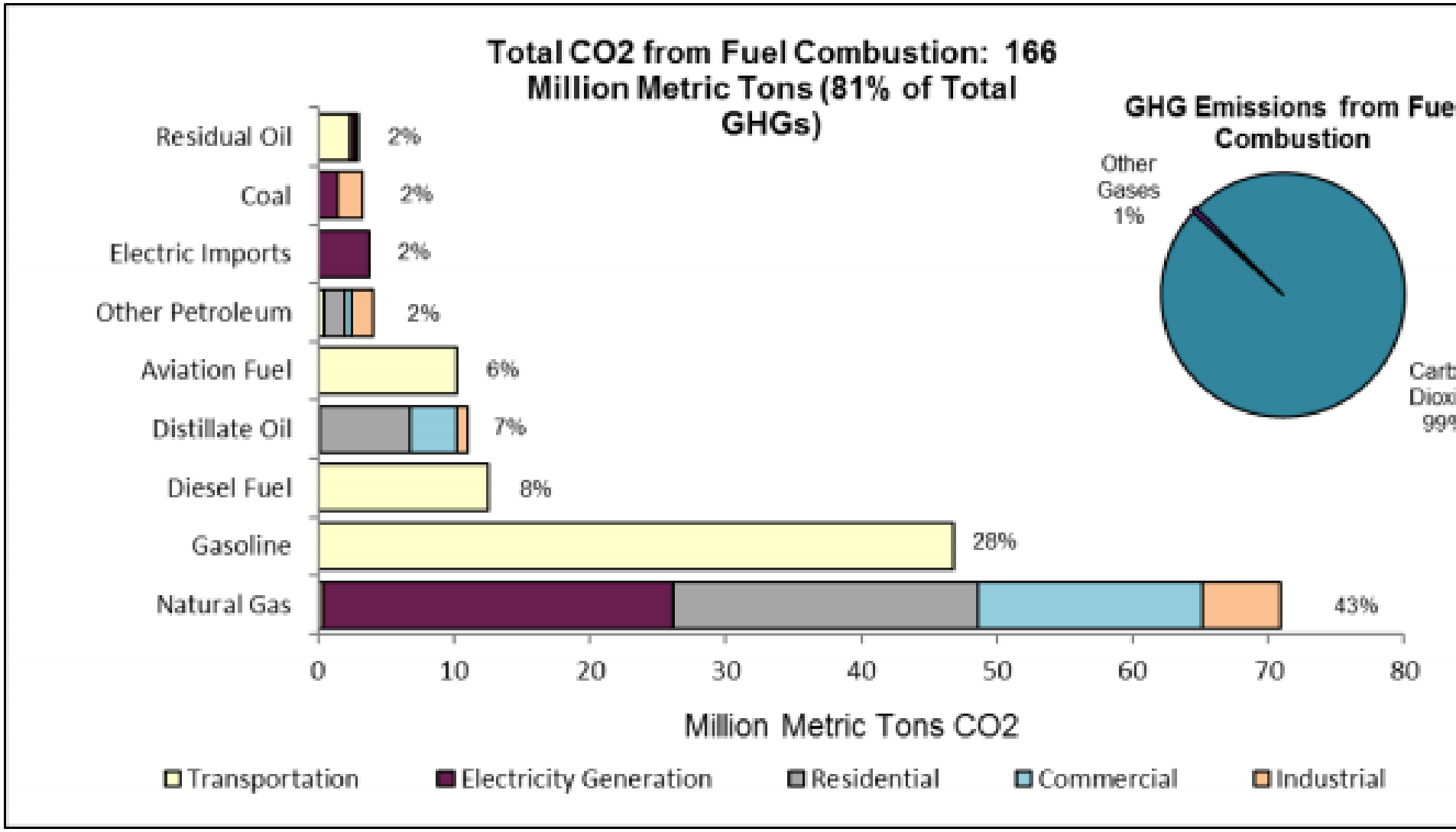
MODEL LAWS FOR DEEP DECARBONIZATION IN THE UNITED STATES

This website provides more than 1000 model and actual federal, state and local laws that legislatures can customize and adopt in order to achieve deep reductions in fossil fuel use and greenhouse gas emissions.

248 PATHWAYS

Figure S-4. 2016 CO_2 Emissions from Fuel Combustion by Fuel Type

CO_2e = carbon dioxide equivalent GHG = greenhouse gas



As Coal Fades in the U.S., Natural Gas Becomes the Climate Battleground

The Comanche Solar facility in Pueblo, Colo., in 2016. An Xcel Energy coal fired power plant is seen in the background. Rick Wilking/Reuters

By Brad Plumer

Natural Gas Is the Rich World's New Coal

Vanessa Dezem Stephen Stapczynski Naureen S. Malik

Published on September 09 2020, 9:30 AM
Last Updated on September 11 2020, 7:37 AM

(Bloomberg) -- Even the cleanest fossil fuel is losing its appeal to rich nations.

Just a few years ago, natural gas was hailed as vital for the transition toward an economy that runs on renewable energy. But sentiment is changing and the fuel is going the same way as coal, its dirtier sibling shunned by governments, utilities and investors.

The cancellation of the giant Atlantic Coast pipeline in the U.S. and Ireland's decision to scrap backing for an import terminal this summer are the latest signs that gas is falling out of favor with everyone from regulators to asset managers.

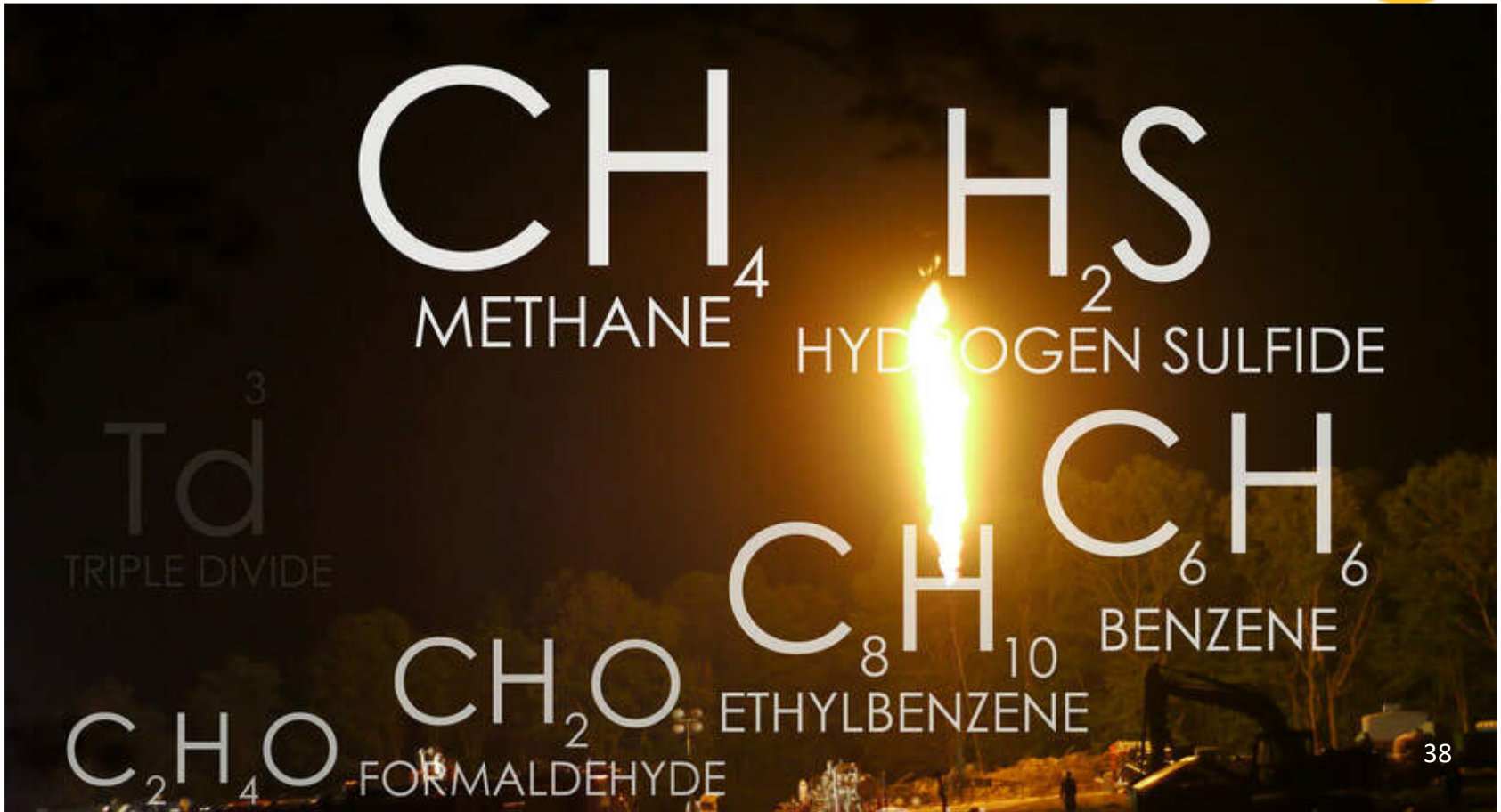
As countries intensify efforts to meet climate obligations, the fuel used for heating, cooking and power production is poised to lose out to solar, wind and private and public energy efficiency

Is Natural Gas the New Coal?

By Justin Mikulka • Friday, September 27, 2019 - 14:12

Read time: 7 mins

DESMOG SERIES



New York Climate Leadership and Community Protection Act of 2019

Reductions below 1990 greenhouse gas emission levels:

2015	8.5%
2030	40%
2050	85% (goal: 100% net)

Electric power demand to be met by:

2030	70% from renewables
2040	100% from “zero emissions”

Minimum requirements:

2025	Efficiency: 185 trillion BTU reduction below 2025 forecast [3,809 trillion BTU]
2025	6 GW distributed solar capacity [now: 1.5 GW]
2030	3 GW energy storage capacity [now: 0.039 GW]
2035	9 GW offshore wind capacity [now: 0]

Energy+Environmental Economics

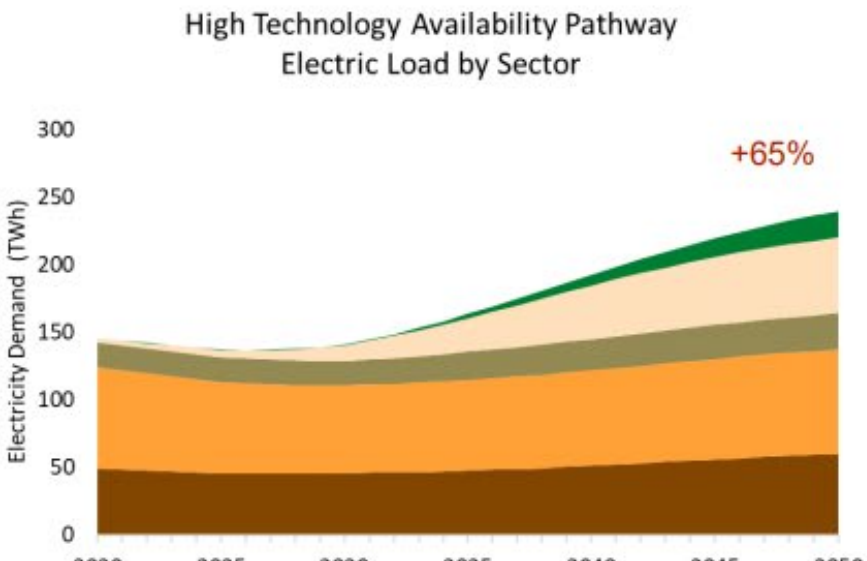
New York State Decarbonization Pathways Analysis

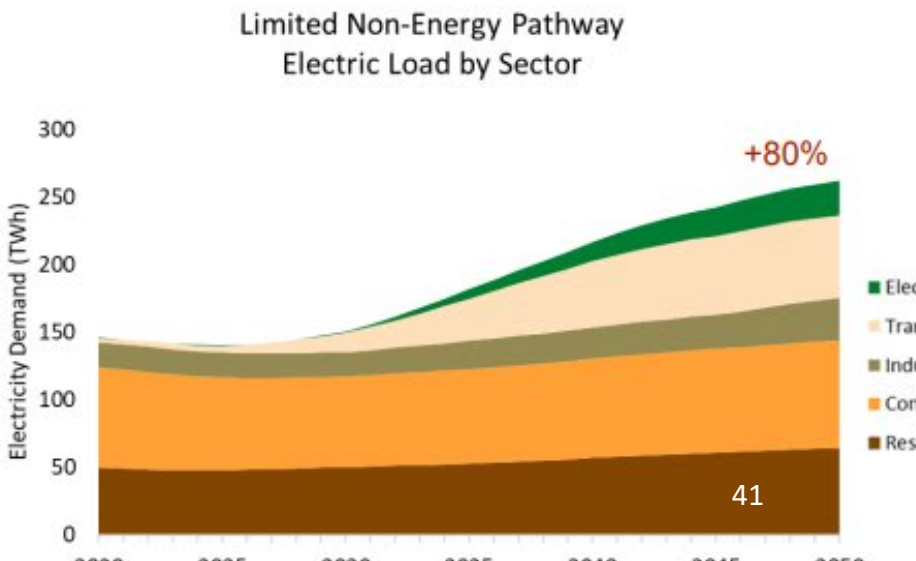
Summary of Draft Findings

June 24, 2020

Annual Electricity Demand

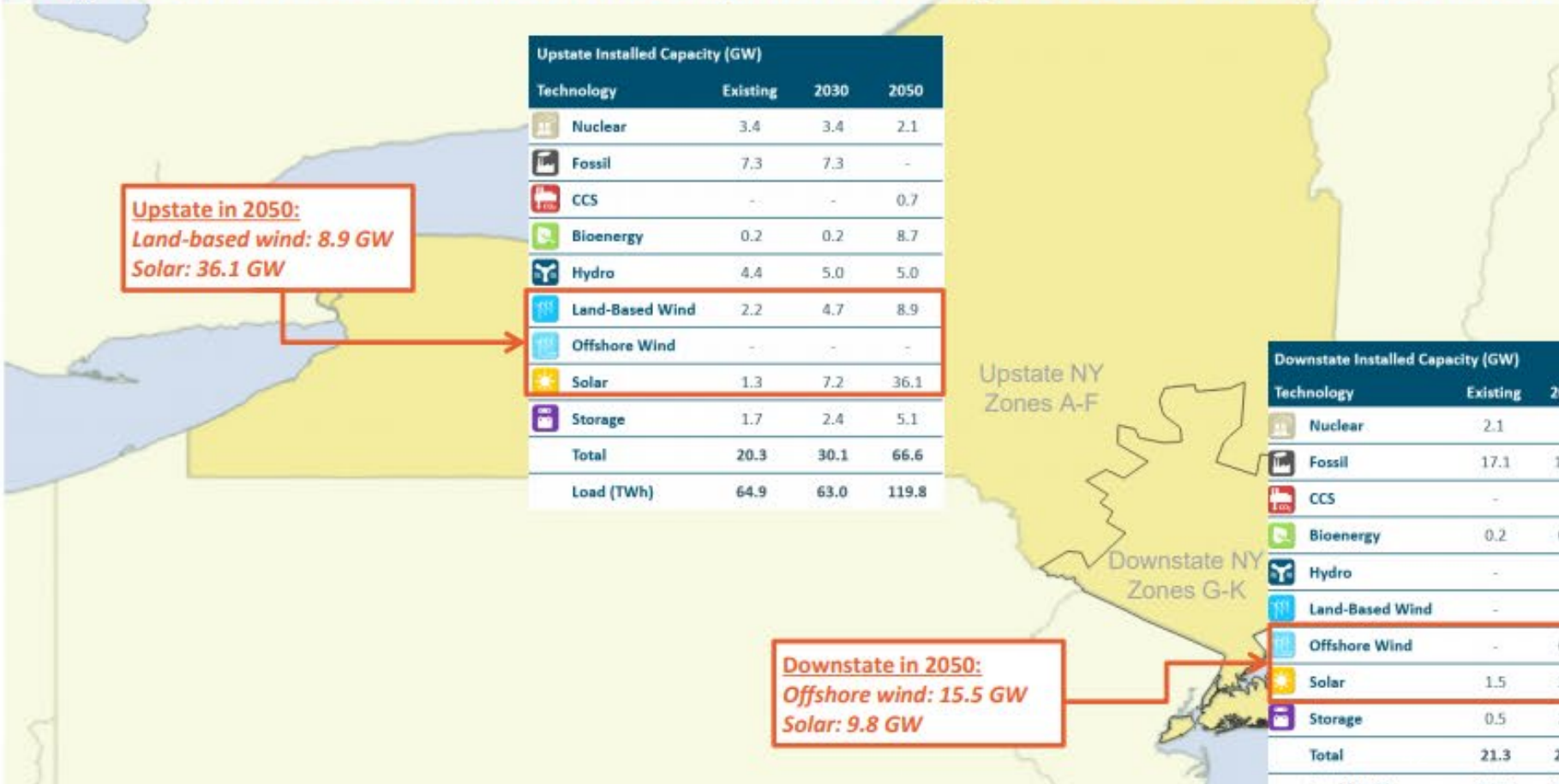
- Further decarbonization of the power sector only gets us a fraction of the way toward the economy-wide goal
- However, end-use electrification to eliminate GHG emissions drives increase in electric lo
  - Analysis within range found in the literature, which project annual load increases ranging 20%-100 by midcentury
  - Range primarily reflects extent and timing of end-use electrification, with some studies assuming l electrification and larger role for renewable gas and/or renewable transportation fuels





Electricity Supply

- New York State has significant potential renewable energy resources and zero-ca technology options, as well as access to adjoining states, provinces, and regiona transmission systems, which offer additional options for energy supply.
- Significant in-state renewable development will require careful siting considerati



Upstate Installed Capacity (GW)			
Technology	Existing	2030	2050
Nuclear	3.4	3.4	2.1
Fossil	7.3	7.3	-
CCS	-	-	0.7
Bioenergy	0.2	0.2	8.7
Hydro	4.4	5.0	5.0
Land-Based Wind	2.2	4.7	8.9
Offshore Wind	-	-	-
Solar	1.3	7.2	36.1
Storage	1.7	2.4	5.1
Total	20.3	30.1	66.6
Load (TWh)	64.9	63.0	119.8

Downstate Installed Capacity (GW)		
Technology	Existing	2
Nuclear	2.1	
Fossil	17.1	
CCS	-	
Bioenergy	0.2	
Hydro	-	
Land-Based Wind	-	
Offshore Wind	-	
Solar	1.5	
Storage	0.5	
Total	21.3	

Electricity Supply – GW Installed Capacity

Energy + Environmental Economics
Pathways to Deep Decarbonization in New York State (June 24, 2020)

	Current	2030	2050
Land-based wind	2.1	4.7	9.0
Offshore wind	0	6.2	15.5
Solar	2.8	10.5	45.9
Fossil	24.4	24.4	0
Bioenergy	0.4	0.4	16.6
Storage	2.2	4.4	10.9

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Home > Resources > New York State Climate Law Tracker

The New York State Climate Law Tracker monitors New York's progress in implementing its path-breaking Climate Leadership and Community Protection Act, Environmental Justice Law, Community Risk and Resiliency Act, and Accelerated Renewable Energy Growth and Community Benefit Act.

Actions can be sorted by deadline or responsible entity, and readers may use the keyword filter to search for actions based on subject matter, statute, or whether an action is overdue. Overdue actions are also highlighted in red. The tracker provides links to relevant abbreviations and definitions, a list of officials who are responsible for implementing New York's climate laws, and related resources such as blog posts and articles.

Readers may download the tracker's data as a spreadsheet by clicking "Download CVS." Please note that in Excel, § will