



CLIMATE CHANGE: COMBATING THE SIXTH MASS EXTINCTION?

Rotary Club of
Castro Valley
February 9, 2021

**Chair, District 5170 RCA Council:
Hon. Rod Diridon Sr.**

Credentials:

Chair, US High Speed Rail Association

Past Chair Intercity High-Speed Rail Committee
American Public Transit Association

Chair Emeritus
California High Speed Rail Authority Board

Emeritus Executive Director (Ret.)
Mineta National Transit Research Consortium
Mineta Transportation Institute

PowerPoint Presented by:

**ROTARY CLUB OF SAN JOSE
in conjunction with
Rotary Climate Action Council
of
Rotary District 5170**

THE 5 EXTINCTIONS: THE CAUSE

- 1) 444 MILLION YEARS AGO: ORDOVICIAN PERIOD ENDS – 86% EXTINCTION
- 2) 375 MILLION YEARS AGO: DEVONIAN PERIOD ENDS – 75% EXTINCTION
- 3) 251 MILLION YEARS AGO: PERMIAN PERIOD ENDS – 96% EXTINCTION
(SET EARTH BACK 300 MILLION YEARS IN EVOLUTIONARY CYCLE)
- 4) 200 MILLION YEARS AGO: TRIASSIC PERIOD ENDS – 80% EXTINCTION
- 5) 66 MILLION YEARS AGO: CRETACEOUS PERIOD ENDS (DINOSAURS): 76% EXTINCTION

ALL OF THOSE EXTINCTIONS WERE CAUSED BY THE BUILD-UP OF CO₂ &
OTHER CARBON-BASED MATERIALS IN THE ATMOSPHERE

6) WILL THERE BE A 6TH EXTINCTION FOR THE PERIOD OF MAMMALS ON EARTH BEGAN 66 MILLION YEARS AGO; OR WILL EVOLUTION AS WE KNOW IT BE ALLOWED TO CONTINUE?

CLIMATE CHANGE

- **HAPPENING NOW AND HUMAN CAUSED**
- **SOME IMPACTS ARE IRREVERSIBLE**
- **ACTIONS TODAY CAN LIMIT FUTURE WARMING**

PHOTO: NASA

SCIENCE: CONSENSUS



- 99.9% OF SCIENTIFIC RESEARCH STUDIES PUBLISHED IN PEER-REVIEWED SCIENTIFIC JOURNALS FIND THAT HUMAN-CAUSED CLIMATE CHANGE IS HAPPENING.

<http://bst.sagepub.com/content/early/2016/04/25/0270467616634958.abstract>

The Washington Post *Democracy Dies in Darkness*



Climate and Environment

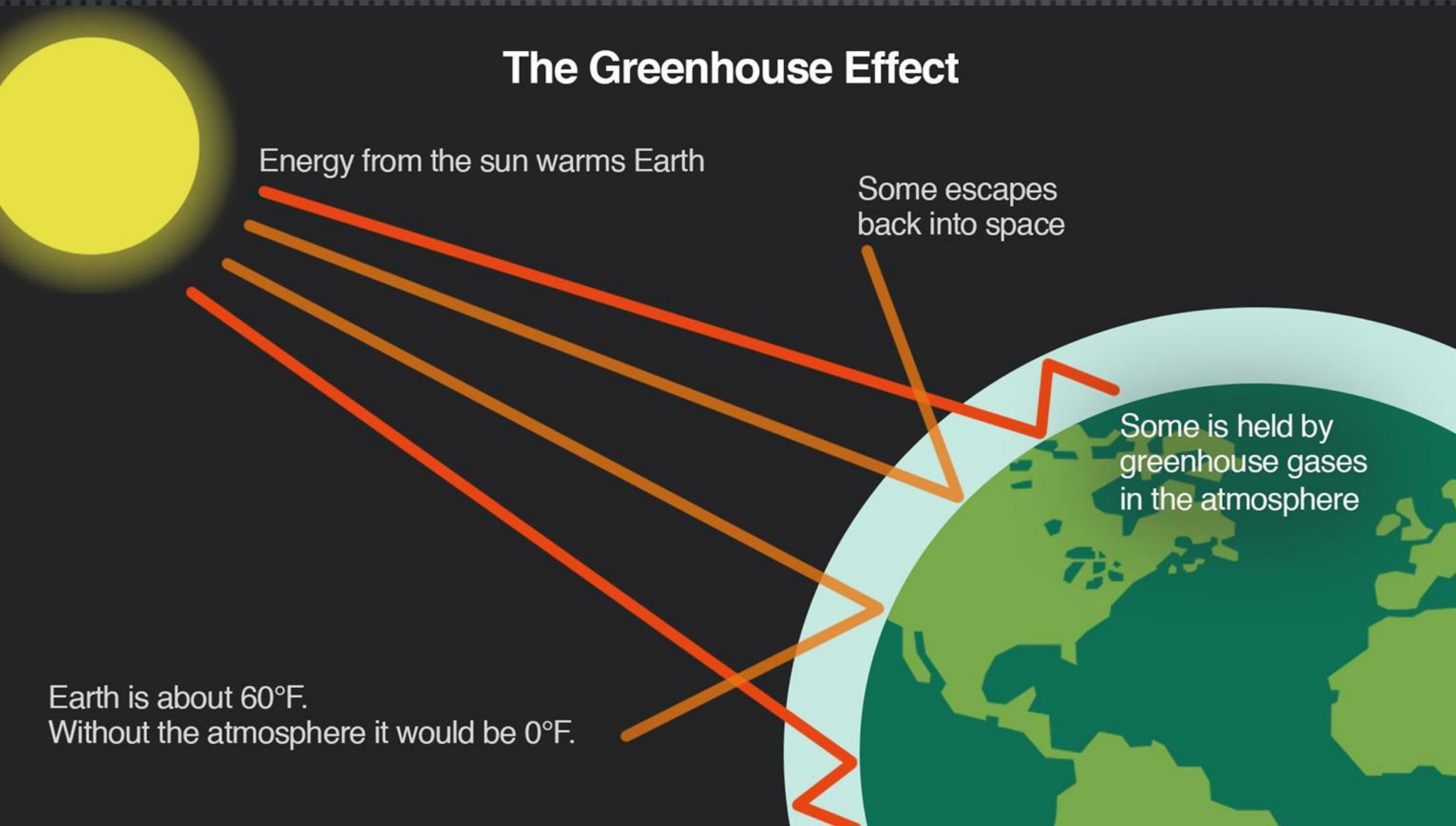
More than 11,000 scientists from around the world declare a 'climate emergency'

By **Andrew Freedman**

November 5, 2019 at 7:18 a.m. PST

SCIENCE: GREENHOUSE EFFECT

The Greenhouse Effect



THE CLIMATE CRISIS SOLUTION IS STILL WITHIN OUR REACH – BARELY . . .

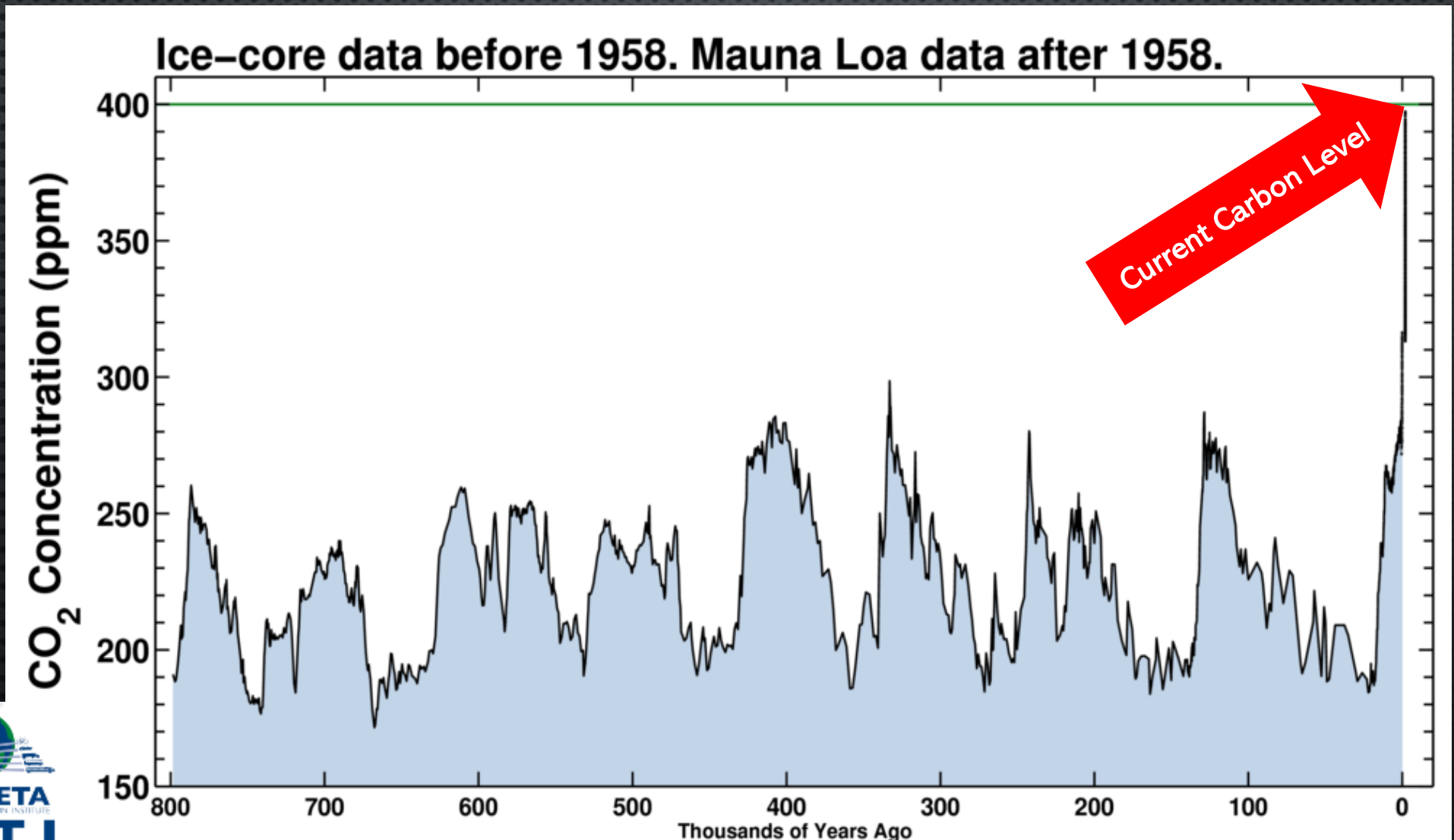
“CLIMATE CHANGE IS THE EXISTENTIAL CHALLENGE OF
OUR HUMAN EVOLUTIONARY CYCLE ON EARTH.
UNIVERSAL EMERGENCY ACTION BY THINKING
INDIVIDUALS MUST TAKE EFFECT WITHIN THE NEXT
DOZEN YEARS TO SAVE EARTH FOR OUR CHILDREN
AND THEIRS. **WE MUST START NOW AND NEVER STOP!”**

HON ROD DIRIDON, SR.,
EXECUTIVE DIRECTOR EMERITUS (RET.)
CONGRESS'S MINETA TRANSPORTATION INSTITUTE
CHAIR OF THE ROTARY CLIMATE ACTION COMMITTEE

The New York Times

Heat-Trapping Gas Passes Milestone, Raising Fears

MAY 11, 2013



CO₂ Causes Rapid Global Warming

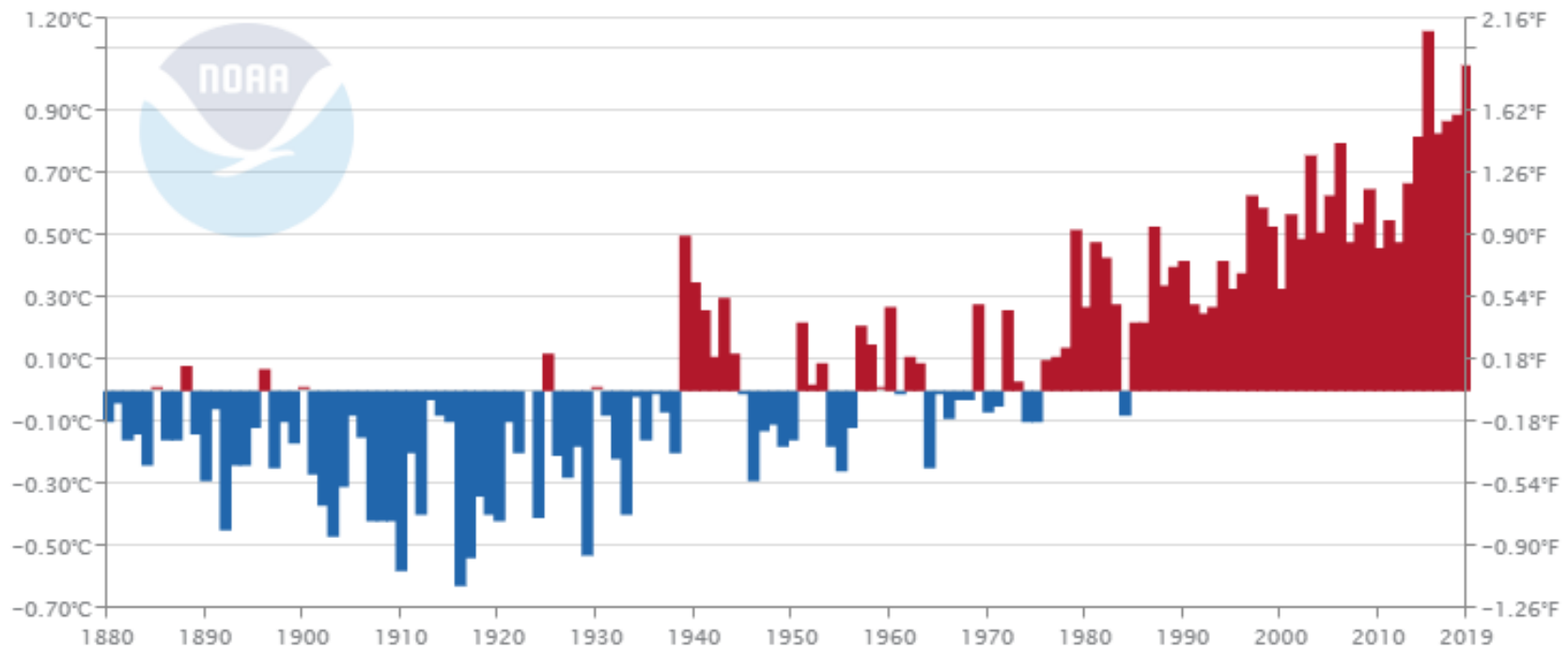
The New York Times

2019 Was the Second-Hottest Year Ever, Closing Out the Warmest Decade

By [Henry Fountain](#) and [Nadja Popovich](#) Jan. 15, 2020

Global Land and Ocean

December Temperature Anomalies



Most CO₂ and Heat caused by Transportation and Electric Generation and Transport

San Jose Mercury News, Page 1, August 8, 2013

State report says global warming's wrath has already arrived

By Paul Rogers

progers@mercurynews.com

Rising ocean waters. Bigger and more frequent forest fires. More brutally hot summer days.

These aren't the usual predictions about global warming based on computer forecasts. They're changes already happening in California, according to a detailed new report issued Thursday by the California Environmental Protection Agency.

Climate change is "an immediate and growing threat" affecting the state's water supplies, farm industry, forests, wildlife and public health, the report says. The 258-page document was written by 51 scientists from the Univer-

sity of California, Scripps Institution of Oceanography, Lawrence Berkeley National Laboratory, U.S. Geological Survey and the National Oceanic and Atmospheric Administration, among other agencies and institutions.

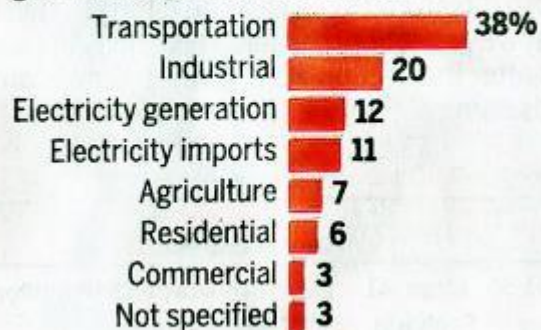
"Climate change is not just some abstract scientific debate," said California EPA Secretary Matt Rodriquez. "It's real, and it's already here."

Most Californians seem to agree. In a poll last month by the nonpartisan Public Policy Institute of California, 63 percent of the state's residents said the effects of global warming are already being felt, while 22 percent

See **WARMING**, Page 8

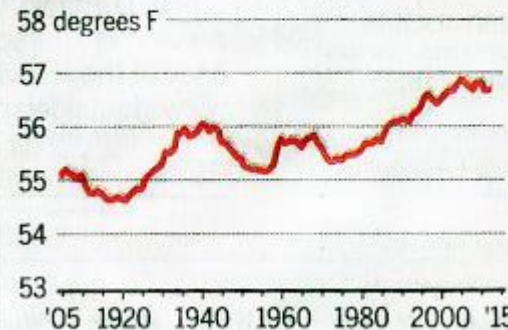
Sources of emissions

Transportation, industry and electrical generation account for 81 percent of all greenhouse gas emissions in California.



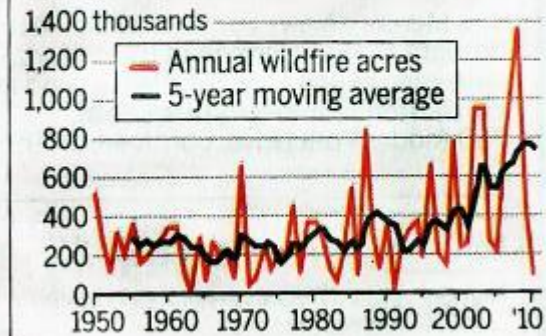
Rising temperatures

Since 1895, annual average temperatures in California have increased by about 1.5 degrees.



More severe fires

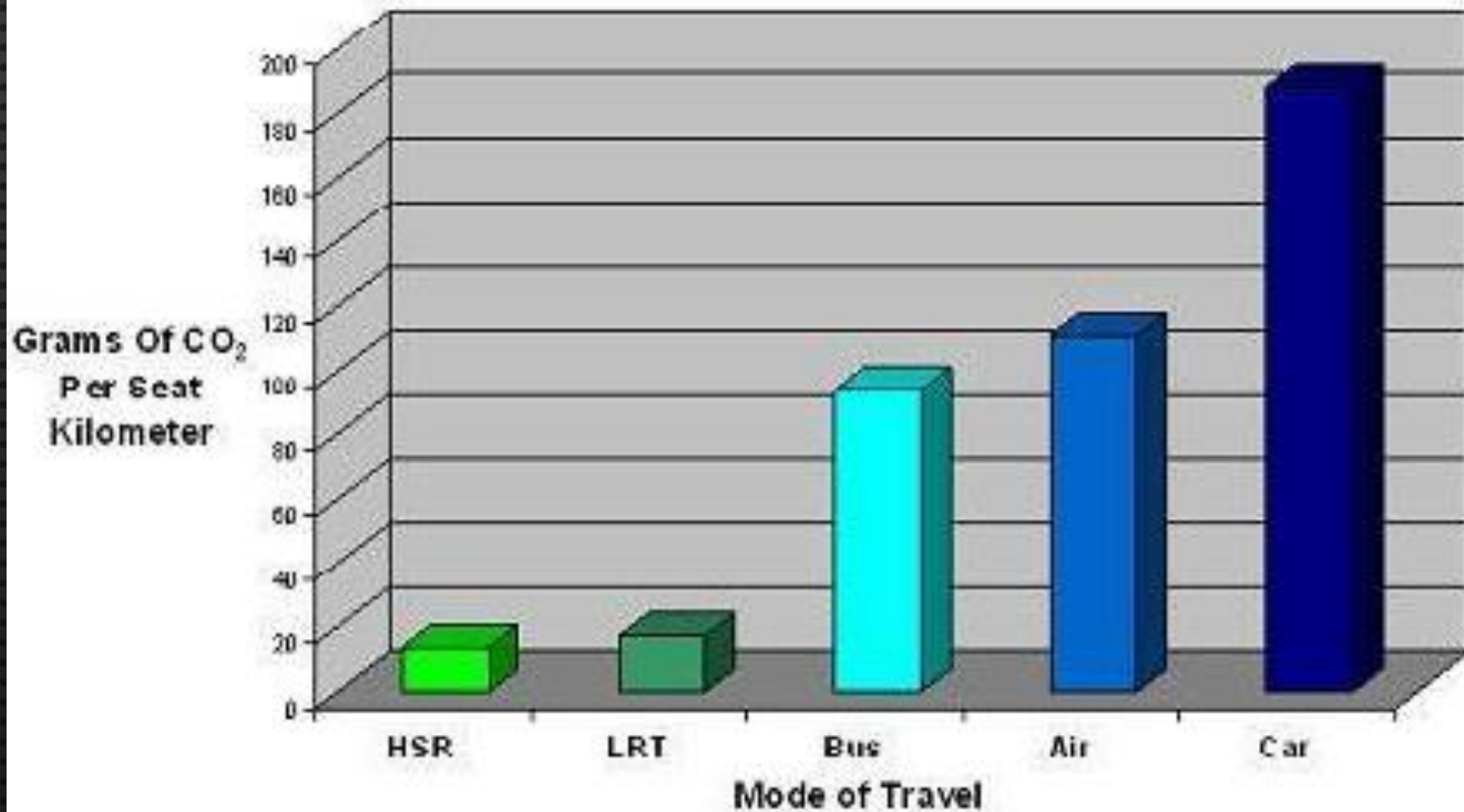
The average annual acreage burned in wildfires in the state since 2000 is almost twice as high as the 1950-2000 average.



Source: Indicators of Climate Change in California, Office of Environmental Health Hazard Assessment

BAY AREA NEWS GROUP

CARBON FOOTPRINT TRANSPORTATION MODE COMPARISON



HSR = High Speed Rail
LRT = Light Rail

Created by Mineta Transportation Institute

WHAT'S HAPPENING?

- FOOD PRODUCTION DISRUPTION LEADING TO STARVATION AND MASS MIGRATION
- UNEXPECTED EPIDEMICS
- WATER SHORTAGES AS MORE LAND TURNS TO DESERT
- RADICALLY INCLEMENT WEATHER CAUSING WILDFIRES, FLOODING AND DROUGHT
- POLAR ICE MELTS CAUSING MASSIVE FLOODING

The Brief Opener

ENVIRONMENT

Climate catastrophe seen just 12 years away

By Justin Worland

CLIMATE SCIENTISTS HAVE UNDERSTOOD FOR decades that unchecked, man-made global warming will wreak havoc on human civilization.

Now a landmark U.N. report released on Oct. 8 rings what scientists hope is a forceful enough alarm to wake the world up. Even the glimmer of light it offers—that we already know how to address climate change and stave off some of its worst effects—bears a bitter shadow, in the finding that political leaders are nowhere close to fully undertaking the necessary steps.

Scientists on the Nobel Prize-winning Intergovernmental Panel on Climate Change (IPCC) point to a global temperature rise of 1.5°C as a threshold the planet cannot cross without seeing some of the worst effects of climate change—including the destruction of ecosystems, the disappearance of some island nations and unpredictable changes to the planet's weather pat-

'We need a plan to save us. We have a short window of time and a huge responsibility.'

have expanded rapidly in recent years largely as a result of market forces. But reaching the target will require government action too, including support for research and development, and modification of the way markets work, in order to account for the negative effects of burning fossil fuels.

"The energy transition we need now for climate purposes needs to move much faster," says Adnan Z. Amin, who heads the International Renewable Energy Agency. "We need policy mechanisms."

THE IPCC REPORT is intended to help spur those policies. Negotiators of the 2015 Paris Agreement included the 1.5°C marker as an ideal target, following a push from developing countries that feared their land could be lost entirely if temperature rise exceeds that level. The IPCC was asked to study the feasibility of the 1.5°C threshold and how it might be achieved.

The new report, released in Seoul, shows we're way off track and that even the commitments made in 2015 by some 190 countries to reduce their greenhouse-gas emissions would allow temperatures to rise around 3°C by 2100.

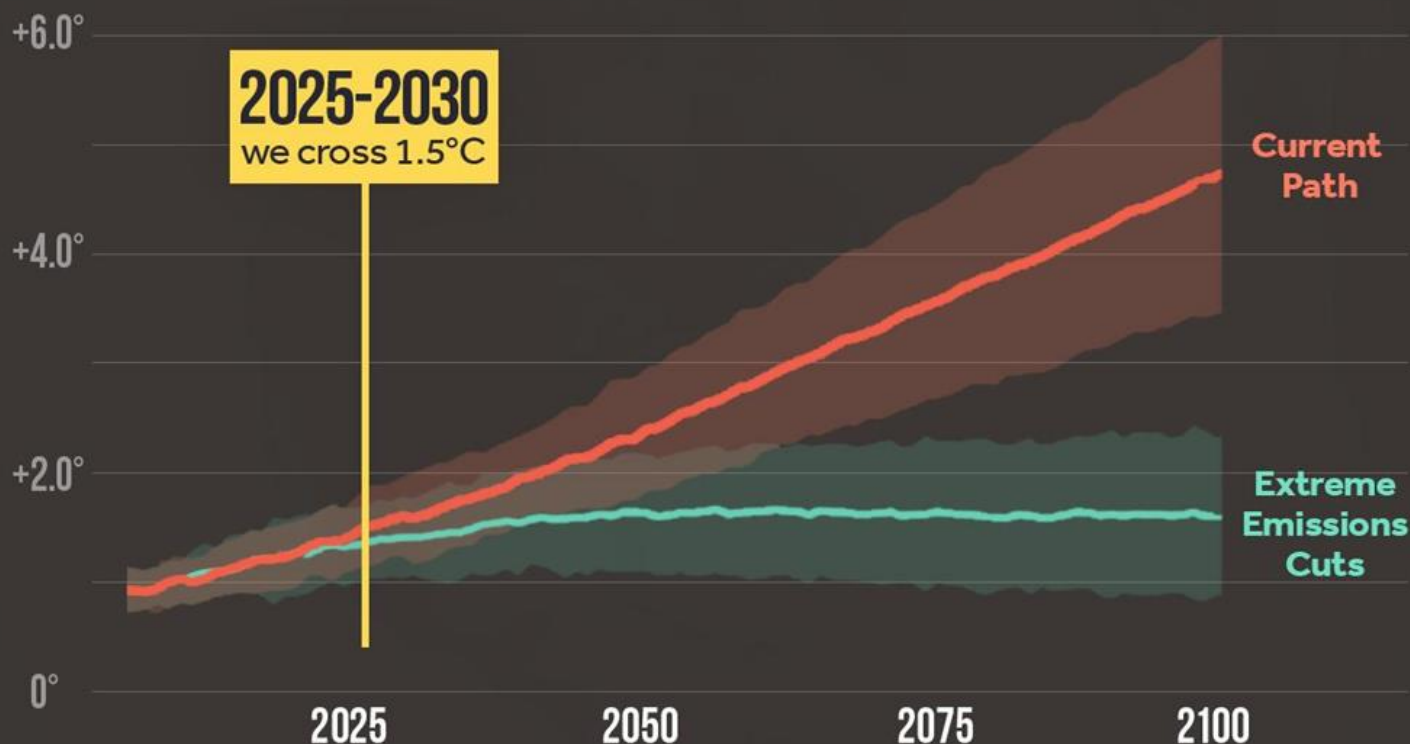
It hasn't helped that in the wake of the historic Paris Agreement, which at the time seemed to herald a new era of cooperation on

TIME MAGAZINE, OCT. 27, 2018

12 YEARS BEFORE THE POINT OF NO RETURN

FUTURE WARMING

Projections (°C) Based on Emissions Decisions



Source: IPCC AR5 Summary for Policy Makers
Temperature baseline adjusted to 1881-1910 to reflect COP 21 targets

Solving climate change is possible, we already have the tools, says energy expert Hal Harvey

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"Electrify everything," improve building codes and modernize the power grid



Hal Harvey, founder and CEO of Energy Innovators, a San Francisco firm that analyzes climate and energy policy. (Photo: Shira Marantz)

By PHIL ROGERS | progers@bayareanewsgroup.com | Bay Area News Group
Published: July 25, 2019 at 1:00 am | UPDATED: July 25, 2019 at 6:08 am

SOLUTIONS EXIST

PRIORITIES:

1. TRANSFORM THE POWER GRID.
2. ELECTRIFY EVERYTHING.
3. ELECTRIFY TRANSPORTATION AT A VERY RAPID PACE.

HAL HARVEY, FOUNDER AND CEO OF ENERGY INNOVATION,
QUOTED IN SAN JOSE MERCURY NEWS ON JULY 25, 2019

SUSTAINABLE ELECTRIC TRANSPORTATION

- High Speed Rail
- Metro and Commuter Rail
- Light Rail/Trolleys
- Electric and Hybrid Buses
- Electric and Hybrid Cars
- Electric and Manual Bicycles and Scooters
- Walking

SUSTAINABLE BUILDINGS

- Home and Backyard Solar Panels
- Home Battery Power Storage
- Purchase of only sustainably generated electricity
- Home Insulation
- Eliminate Gas Heating, Fireplaces and other Wood Burning

Note: Significant technical and financial support is available through Air Quality Management Districts or Metropolitan Transportation Commissions

BE A CLIMATE CHANGE AMBASSADOR

- Talk to your family, friends, neighbors.
- Insert your climate change concern into your daily conversations.
- Volunteer to speak to your favorite community groups using this PowerPoint
- Buy or lease an electric car; install solar at home and/or work.
- Pray we have a future for our children!

San Francisco Bay Area Transit Integration

- n **Commuter Rail**
 - Caltrain, ACE, Amtrak
- n **BART Rapid Transit**
 - Existing
 - Silicon Valley Extension
- n **Light Rail Transit**
 - Existing
 - Vasona/Capitol Extensions
 - Potential Future Corridors
- n **Bus, Local & Express Service**
- n **Proposed High Speed Rail**
- n **Multimodal Station Hubs**
 - Downtown Diridon Station
 - SJ Mineta International Airport



RESOURCES

NASA CLIMATE

- [CLIMATE.NASA.GOV](https://climate.nasa.gov)

NATIONAL CLIMATE ASSESSMENT

- [SCIENCE2017.GLOBALCHANGE.GOV](https://science2017.globalchange.gov)

CLIMATE CENTRAL

- [WWW.CLIMATECENTRAL.ORG](https://www.climatecentral.org)

WXSHIFT

- [WXSHIFT.COM](https://wxshift.com)

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

- 415 771 6000 REQUEST BEBA

METROPOLITAN TRANSPORTATION COMMISSION

- 415 778 6780 AND REQUEST RANDY RENTSCHLER

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