

ERIC COREY FREED

 @ericcoreyfreed

DIRECTOR OF SUSTAINABILITY
CANNONDESIGN



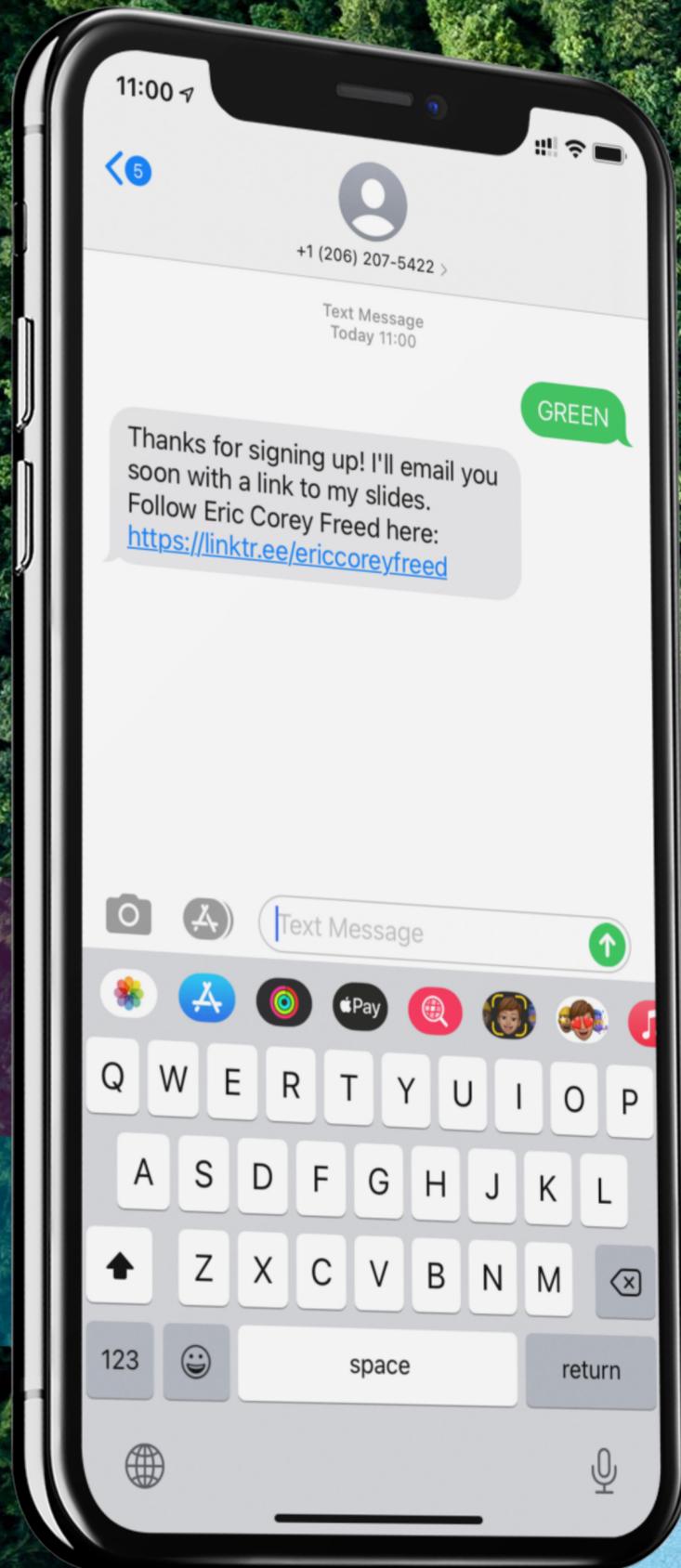


CANNONDESIGN



@ericcoreyfreed

eric@organicarchitect.com



text:

GREEN

to **206 - 207 - 5422**





text: **GREEN**
to:
206-207-5422

LEARNING MADE EASY



Circular Economy

for **dummies**
The Dummies Brand



Re-
struct

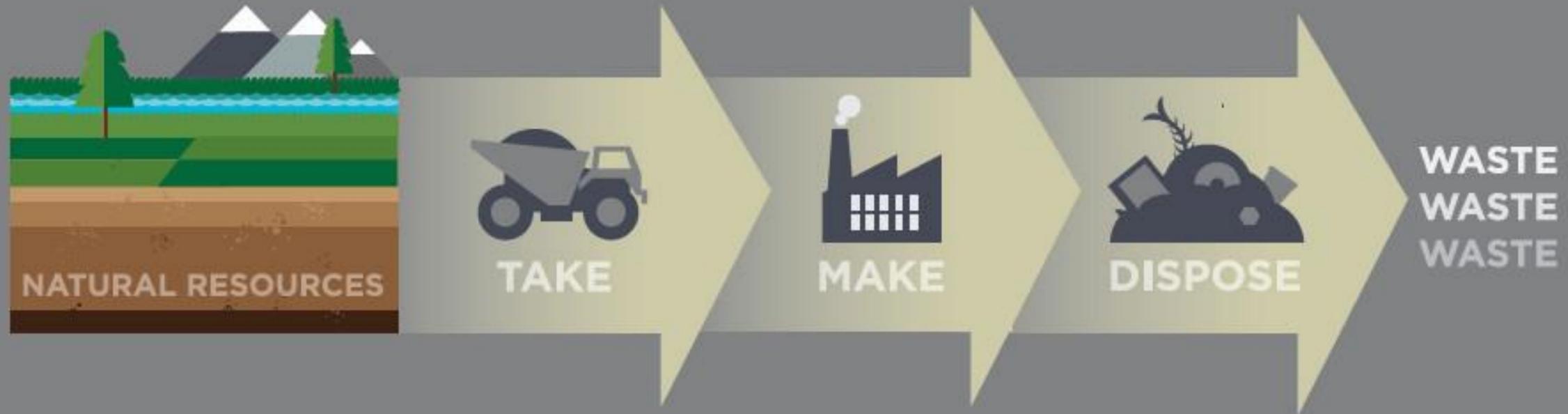
Reject the
'take-make-waste'

Kyle J. Ritchie

LEED AP, WELL AP, EcoDistricts AP
Founder, Circular Economy Studio

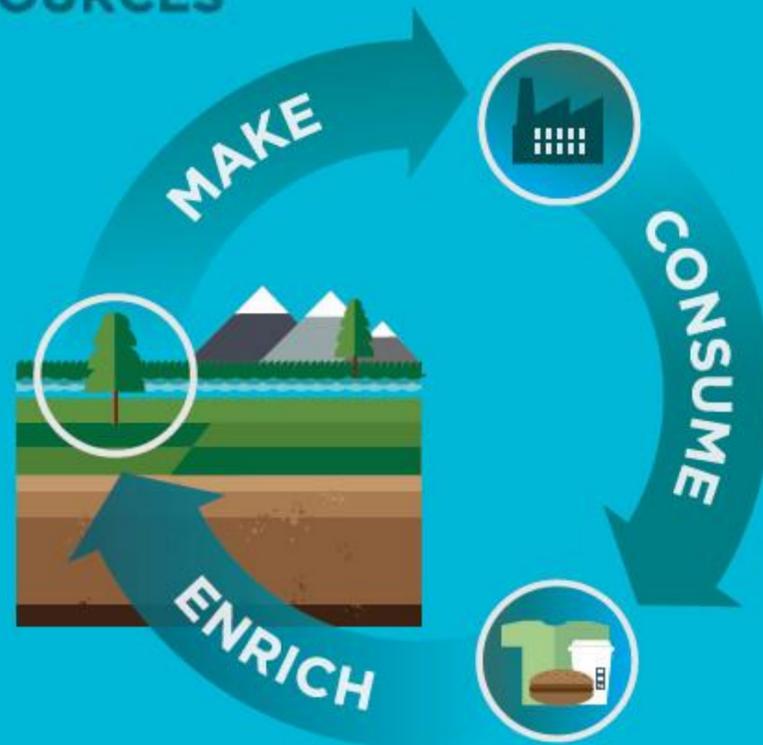
Eric Corey Freed

RA, LEED Fellow, LFA, EcoDistricts AP
Senior Vice President of Sustainability,
Cannon Design

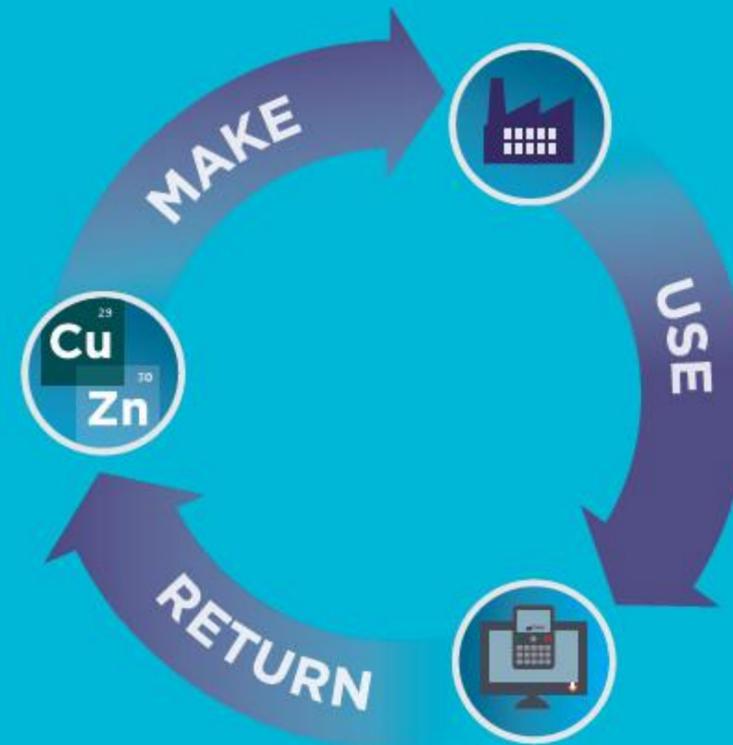


ENERGY FROM FINITE SOURCES

ENERGY FROM RENEWABLE SOURCES



BIOLOGICAL MATERIALS



TECHNICAL MATERIALS

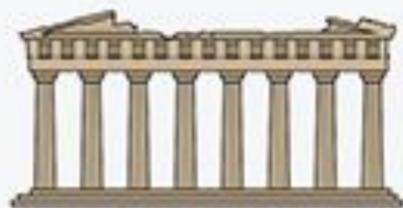




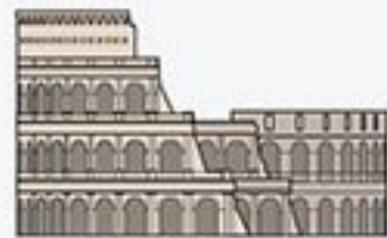
NEOLITHIC



ANCIENT EGYPTIAN



ANCIENT GREEK



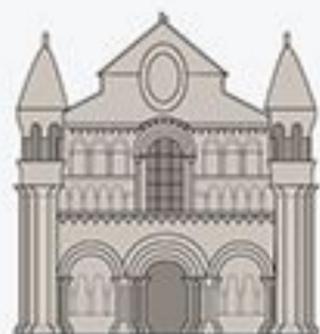
ANCIENT ROMAN



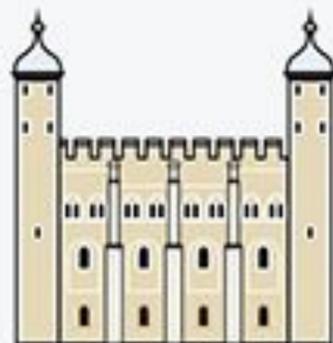
BYZANTINE



MOORISH



ROMANESQUE



NORMAN



GOthic



MEDIEVAL



RENAISSANCE



TUDOR



ELIZABETHAN



INDOISLAMIC



BAROQUE



JACOBEAN



PALLADIAN



ROCOCO









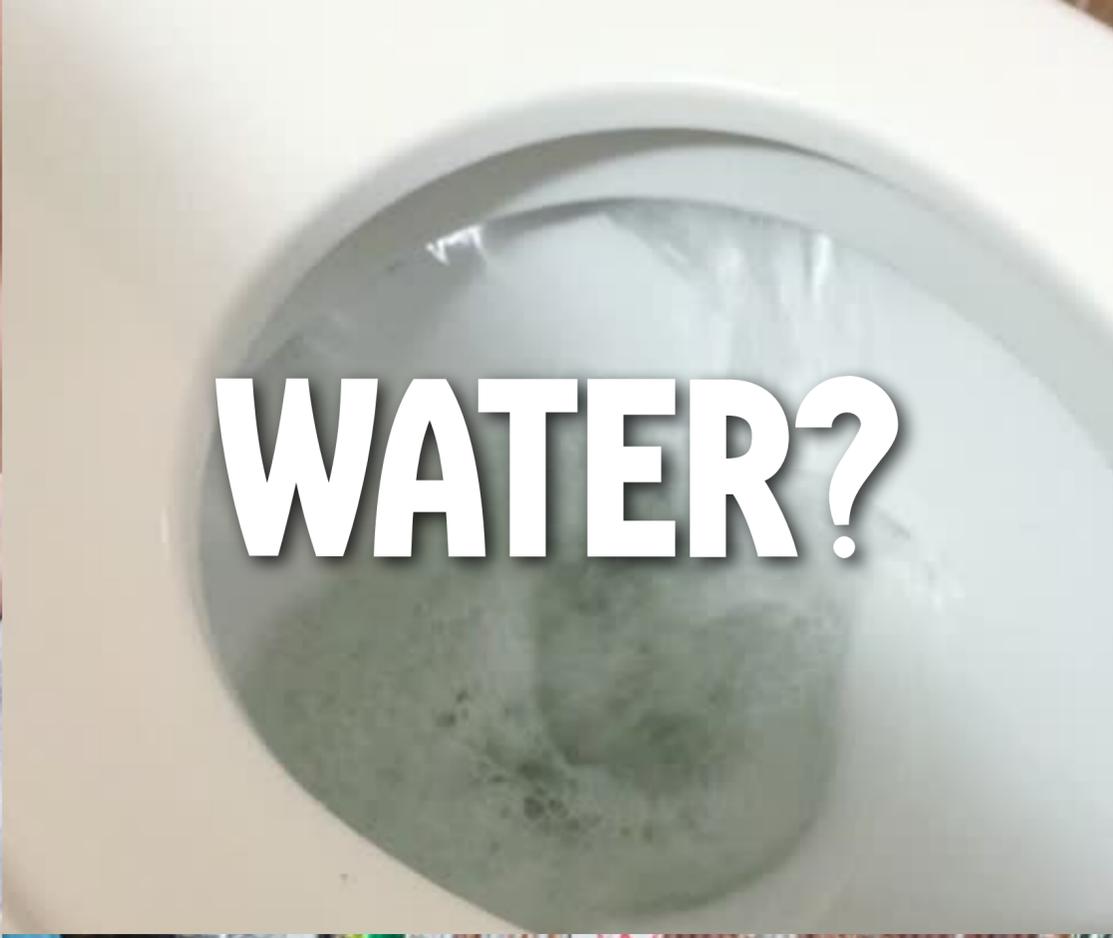




ENERGY?



HEALTH?



WATER?



WASTE?

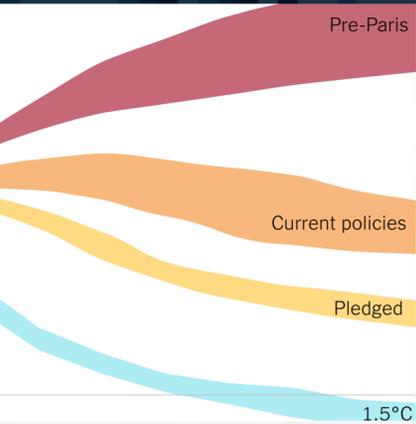


RESOURCES?



COST?

Drivers Shaping A Regenerative Future



Climate Commitments

Electrification Push

Water Shortages

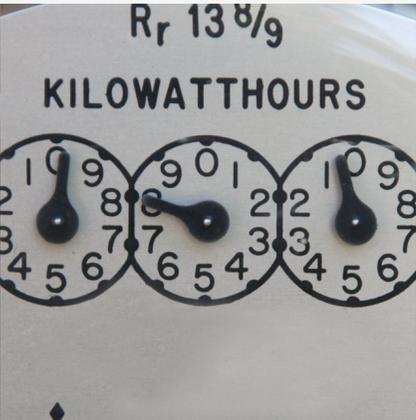
Attract/Retain Talent

Need for Transparency

Equity/DEI

Refrigerants GWP

ESG / CSR



Material Shortages

Labor Shortages

Resiliency Needs

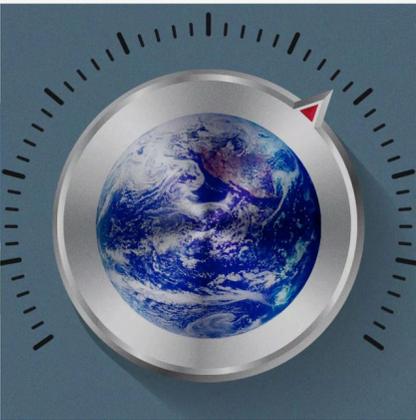
Carbon Liability

Energy Fluctuation

Energy Sourcing

Need to Innovate

Customer Demand



Shareholder Pressure

Climate Risk

Credit Risk

Carbon Accounting

Social Cost Carbon

Carbon Regulation

Waste as Liability

Supply Chain Strength

TODAY'S THREE THINGS

the urgency

redefining cost

innovation approach



the urgency

"All the News
That's Fit to Print"

The New York Times

Late Edition

New York: Today, sunny, cool. High 74-79. Tonight, increasing clouds. Low 57-65. Tomorrow, morning clouds, then windy and warmer. High 79-88. Yesterday: High 87, low 67. Details, page A18.

VOL. CXXXVII . . . No. 47,546

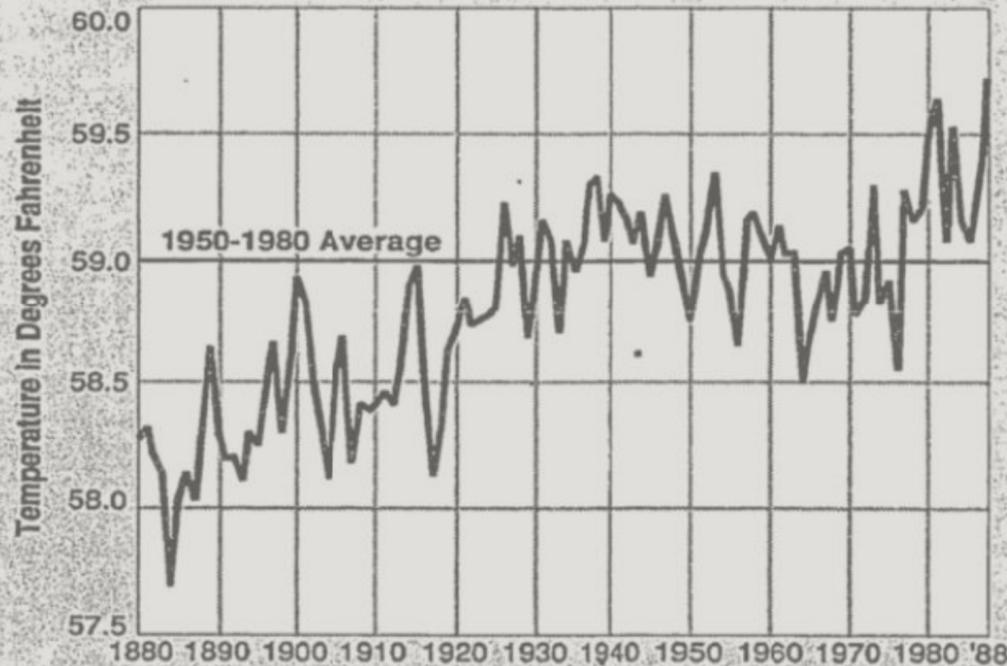
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NEW YORK, FRIDAY, JUNE 24, 1988

50 cents beyond 75 miles from New York City,
except on Long Island.

30 CENTS

Global Warming Has Begun, Expert Tells Senate



Global Warming: Greenhouse Effect?

Average global temperatures through the first five months of 1988. As a baseline, scientists use the global average from 1950 to 1980.

Source: James E. Hansen and Sergej Lebedeff

The New York Times/June 24, 1988

Sharp Cut in Burning of Fossil Fuels Is Urged to Battle Shift in Climate

By PHILIP SHABECOFF

Special to The New York Times

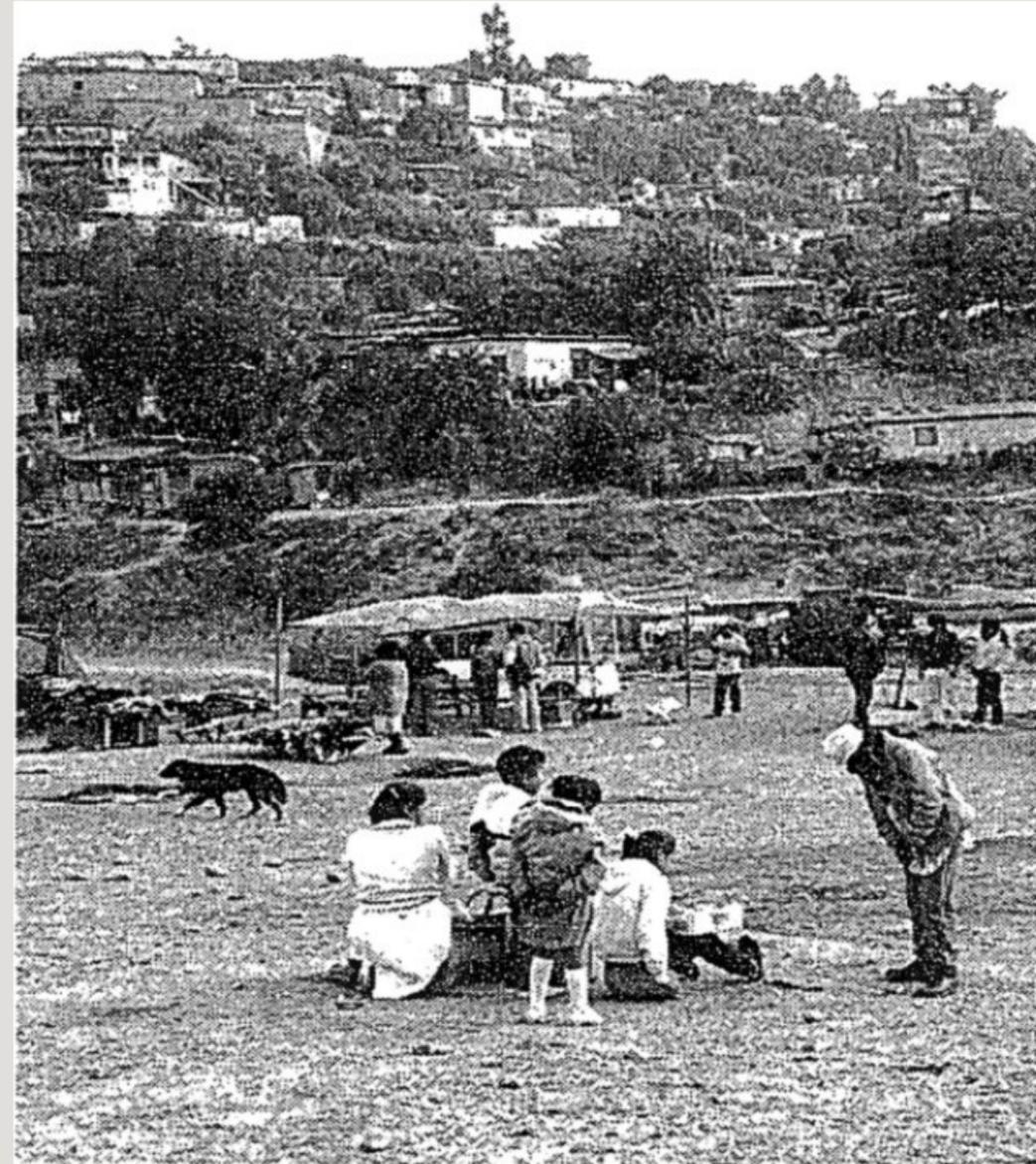
WASHINGTON, June 23 — The earth has been warmer in the first five months of this year than in any comparable period since measurements began 130 years ago, and the higher temperatures can now be attributed to a long-expected global warming trend linked to pollution, a space agency scientist reported today.

Until now, scientists have been cautious about attributing rising global temperatures of recent years to the predicted global warming caused by pollutants in the atmosphere, known as the "greenhouse effect." But today Dr. James E. Hansen of the National Aeronautics and Space Administration told a Congressional committee that it was 99 percent certain that the warming trend was not a natural variation but was caused by a buildup of carbon dioxide and other artificial gases in the atmosphere.

An Impact Lasting Centuries

Dr. Hansen, a leading expert on climate change, said in an interview that there was no "magic number" that showed when the greenhouse effect was actually starting to cause changes in climate and weather. But he added, "It is time to stop waffling so much and say that the evidence is pretty strong that the greenhouse effect is here."

If Dr. Hansen and other scientists



The New York Times/Larry Rohter

Cañon Zapata in Tijuana, Mexico, the busiest illegal crossing point.

IMMIGRATION LAW IS FAILING TO CUT FLOW FROM MEXICO

ECONOMIC FACTORS CITED

Illegal Entries Are on the Rise as More Come From Large Cities and Stay Longer

By LARRY ROHTER

Special to The New York Times

TIJUANA, Mexico, June 18 — The 1986 immigration law is failing to stem the illegal flow of Mexicans into the United States and may be creating new problems on both sides of the border by distorting traditional immigration patterns, Mexican and American researchers say.

Studies by immigration specialists at the College of the Northern Border in Tijuana and the Center for United States-Mexican Studies at the University of California, San Diego, indicate that the number of Mexicans illegally seeking work in the United States has actually increased in recent months.

The data also show that these illegal immigrants are staying in the United States longer, are increasingly arriving in family groups and are coming in growing numbers from parts of Mexico that have not sent many migrants in the past.

No Effect on Flow Seen

"There is no sign the legislation has

Drought Raising Food Prices; Inflation Effect Seems Minor

By ROBERT D. HERSHEY Jr.

Special to The New York Times

WASHINGTON, June 23 — The severe drought gripping the farm belt has begun to raise the supermarket

Other analysts, however, do not entirely accept official reassurances. They worry that the jolt could be great

High Court Getting Unusual Plea

“All the News
That’s Fit to Print”

The New York Times

Late Edition

Today, cloudy, not as warm, still humid, stray thunderstorms, high 82. Tonight, some clearing, muggy, low 70. Tomorrow, clouds and sunshine, high 82. Weather map, Page 21.

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NEW YORK, SUNDAY, JULY 18, 2021

\$6.00

U.S. STOOD BEHIND HAITI’S PRESIDENT AS TURMOIL GREW

FEARS OF CRISIS IGNORED

Long Before Deadly Plot,
a Washington Habit of
Backing Autocrats

By NATALIE KITROEFF
and MICHAEL CROWLEY

As protesters hurled rocks outside Haiti’s national palace and set fires on the streets to demand President Jovenel Moïse’s resignation, President Donald J. Trump invited him to Mar-a-Lago in 2019, posing cheerfully with him in one of the club’s ornate entryways.

After members of Congress warned that Mr. Moïse’s “anti-democratic abuses” reminded them of the run-up to the dictatorship that terrorized Haiti in decades past, the Biden administra-



AUDE GUERRUCCI/REUTERS

Parched farmland in California, which is experiencing its most severe drought since the 1970s.



NEWS ANALYSIS

Climate Change Comes For the Wealthy Nations

Brutal Heat and Deadly Floods Show World
Unprepared to Cope With Extreme Weather

By SOMINI SENGUPTA

Some of Europe’s richest countries lay in disarray this weekend, as raging rivers burst through their banks in Germany and Belgium, submerging towns, slamming parked cars against trees and leaving Europeans shellshocked at the intensity of the destruction.

Only days before in the Northwestern United States, a region famed for its cool, foggy weather, hundreds had died of heat. In Canada, wildfire had burned a village off the map. Moscow reeled from record temperatures. And this weekend the northern Rocky Mountains were bracing for yet another heat wave, as wildfires spread across 12 states in the American West.

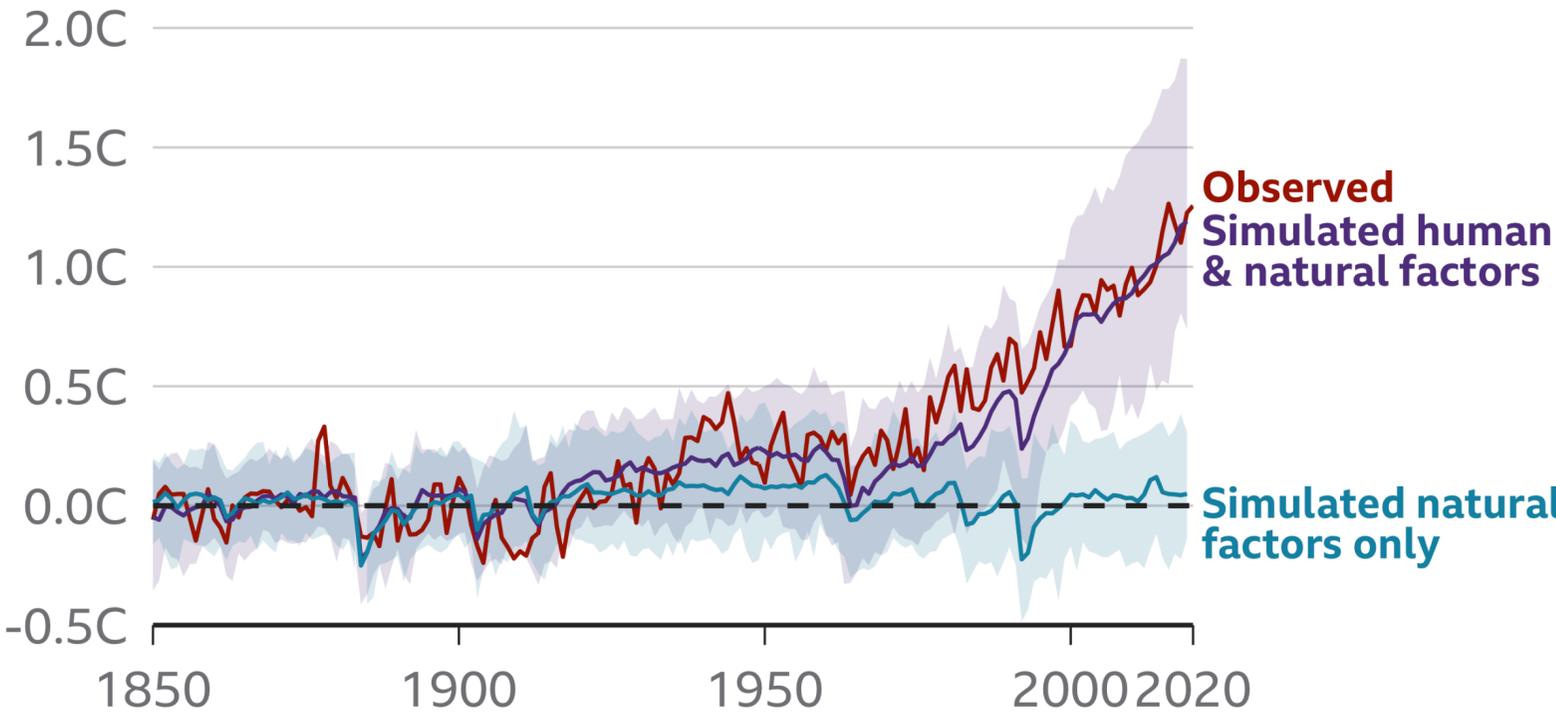
something we have to do right now. We have to save people’s lives.”

The floods in Europe have killed at least 170 people, most of them in Germany, Europe’s most powerful economy. Across Germany, Belgium and the Netherlands, hundreds have been reported as missing, which suggests the death toll could rise. Questions are now being raised about whether the authorities adequately warned the public about risks.

The bigger question is whether the mounting disasters in the developed world will have a bearing on what the world’s most influential countries and companies will do to reduce their own

Human influence has warmed the climate

Change in average global temperature relative to 1850-1900, showing observed temperatures and computer simulations



Note: Shaded areas show possible range for simulated scenarios

Source: IPCC, 2021: Summary for Policymakers



AUG 10, 2021

IPCC report is 'code red for humanity'

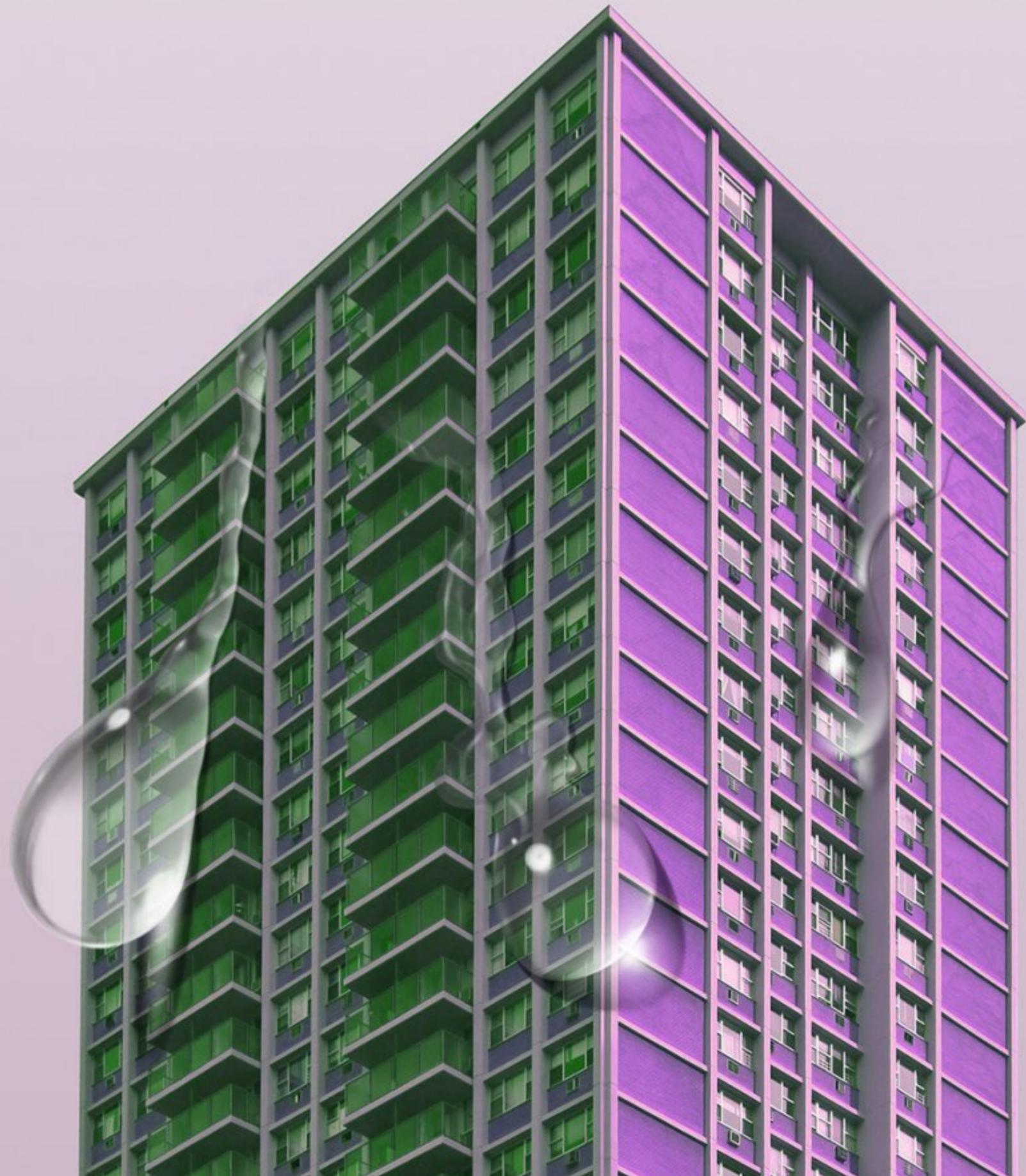




AUG 10, 2021

There's Already Enough Greenhouse Gas
in the Air to Heat the Planet by 1.5°C

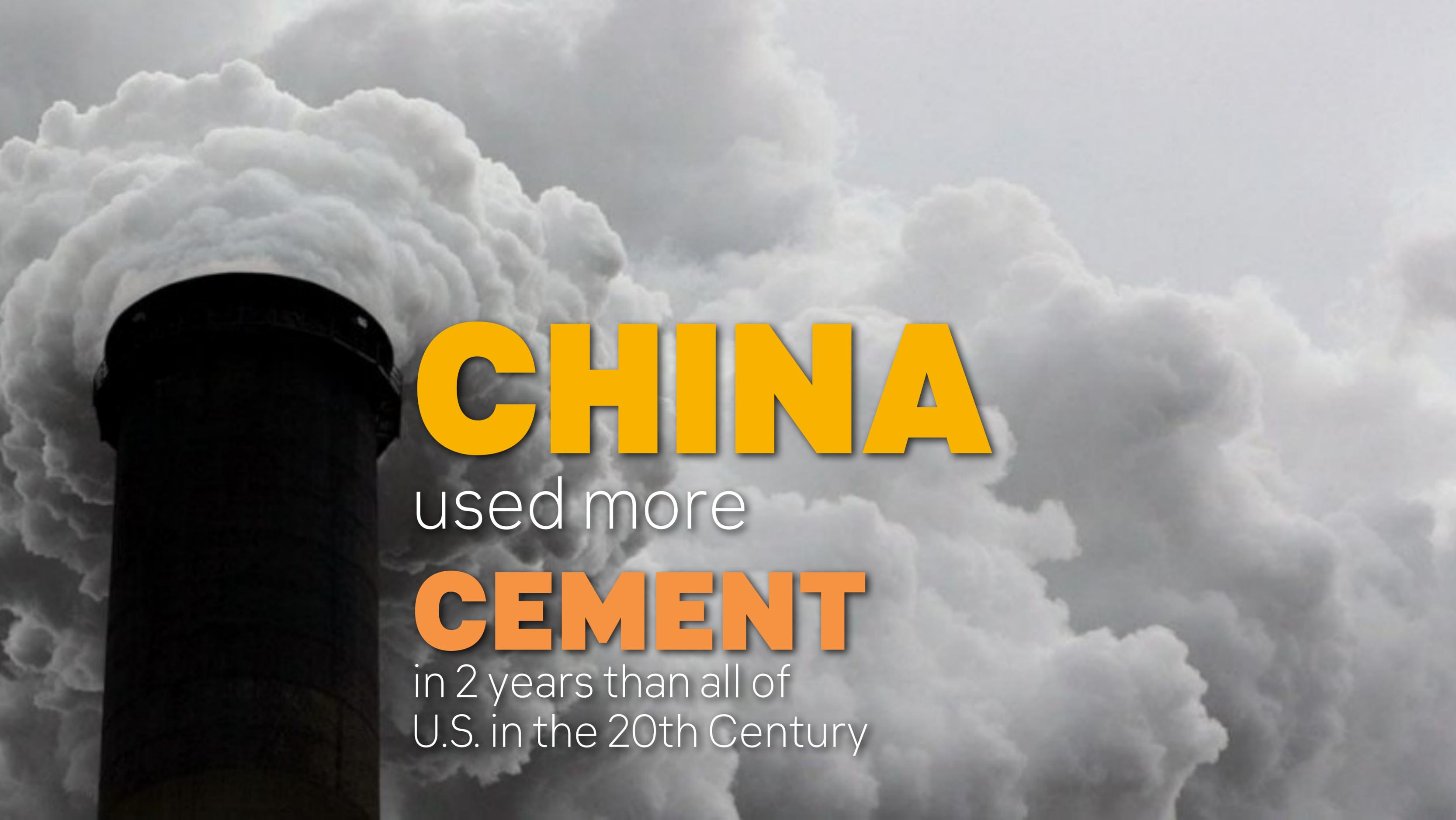
Bloomberg





5 weeks

40 years



CHINA

used more

CEMENT

in 2 years than all of
U.S. in the 20th Century

4 \$1 stores/day





1100 gigatonnes





text: **GREEN**
to:
206-207-5422

CLINTON P. ANDERSON, N. MEX., CHAIRMAN
HENRY M. JACKSON, WASH.
ALAN BIBLE, NEV.
JOHN A. CARROLL, COLO.
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FRANK E. MOSS, UTAH
DREW E. LONG, HAWAII
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GORDON ALLOTT, COLO.
HIRAM L. FONG, HAWAII
JACK MILLER, IOWA
RICHARD L. CALLAGHAN, STAFF DIRECTOR

United States Senate

COMMITTEE ON
INTERIOR AND INSULAR AFFAIRS

February 14, 1961
Washington, D. C.

THE WHITE HOUSE
FEB 15 11 59 AM '61

RECEIVED
FEB 16 1961

CARDED

The President

The White House

Dear Mr. President:

When we were visiting yesterday, I mentioned to you the view of Dr. von Neumann, who was a member of the Atomic Energy Commission up to the time of his death, as to the possibility of weather modification. I enclose photostats taken from Fortune Magazine of June, 1955, carrying the von Neumann article, "Can We Survive Technology?" You will see that under heading of "Controlled climate," he points out that weather control and climate control are really much broader than rain making. He realized that a new Ice Age might be manufactured in order to annoy others; that changes could affect the level of the seas and hence the habitability of the continental coastal shelves; that hurricanes might be corrected or depressed, and the like.

These are his words:

"All this will merge each nation's affairs with those of every other, more thoroughly than the threat of a nuclear or any other way may already have done."

I mean only to suggest to you that this is an interesting subject and one which should not be put entirely on the shelf.

Sincerely yours,

Clinton P. Anderson

THE WHITE HOUSE

WASHINGTON

October 5, 1997

MR. PRESIDENT:

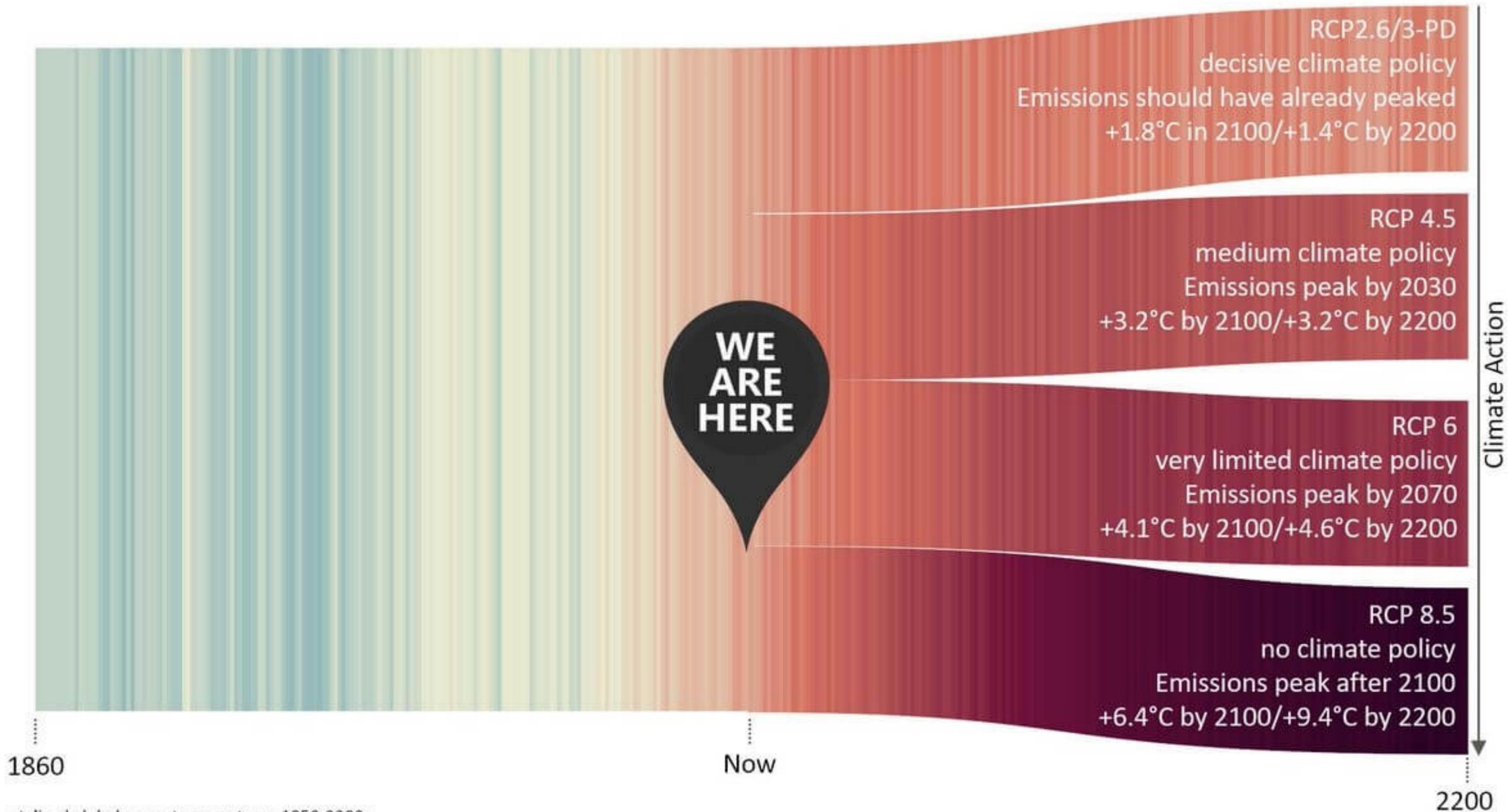
This is a decision memo on climate change. I am forwarding it to you now because you may want to look it over before the White House Conference on Monday. *However, you should under no circumstances actually check off a decision before the White House Conference is held, since that Conference is intended to be a forum that is still able to inform your policy thinking.* In addition, since the memo was just finished late tonight, other relevant White House staff, like Erskine, Rahm, John Podesta and John Hilley, haven't had a chance to comment on it yet. I also expect that you may want to have one more meeting on this subject before reaching a final decision.

Because of the late hour at which it was finished, and the fact that it is not yet ripe for decision, Phil hasn't done a summary of it yet.

TSS
Todd Stern

Cole

Copied
Stern
Spearing
McGinty
Tarullo
Steinberg
COS



stylised global mean temperatures 1850-2200;
design by @alxrdk based on warming stripes from @ed_hawkins



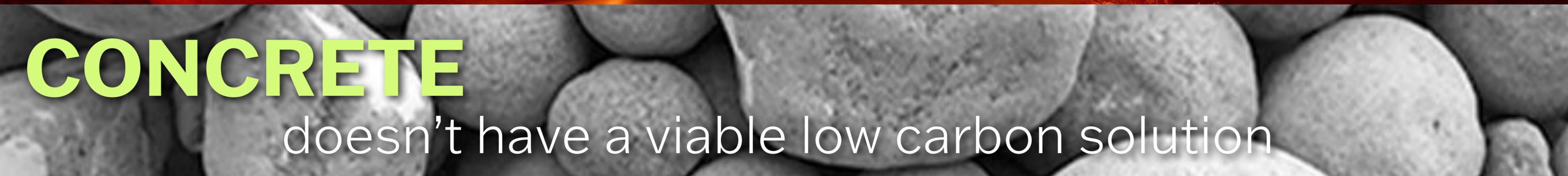
CLIMATE CHANGE

will drive a price on carbon



LIABILITY

will make whole areas uninsurable



CONCRETE

doesn't have a viable low carbon solution



MATERIAL DEMAND

will require engineered living materials

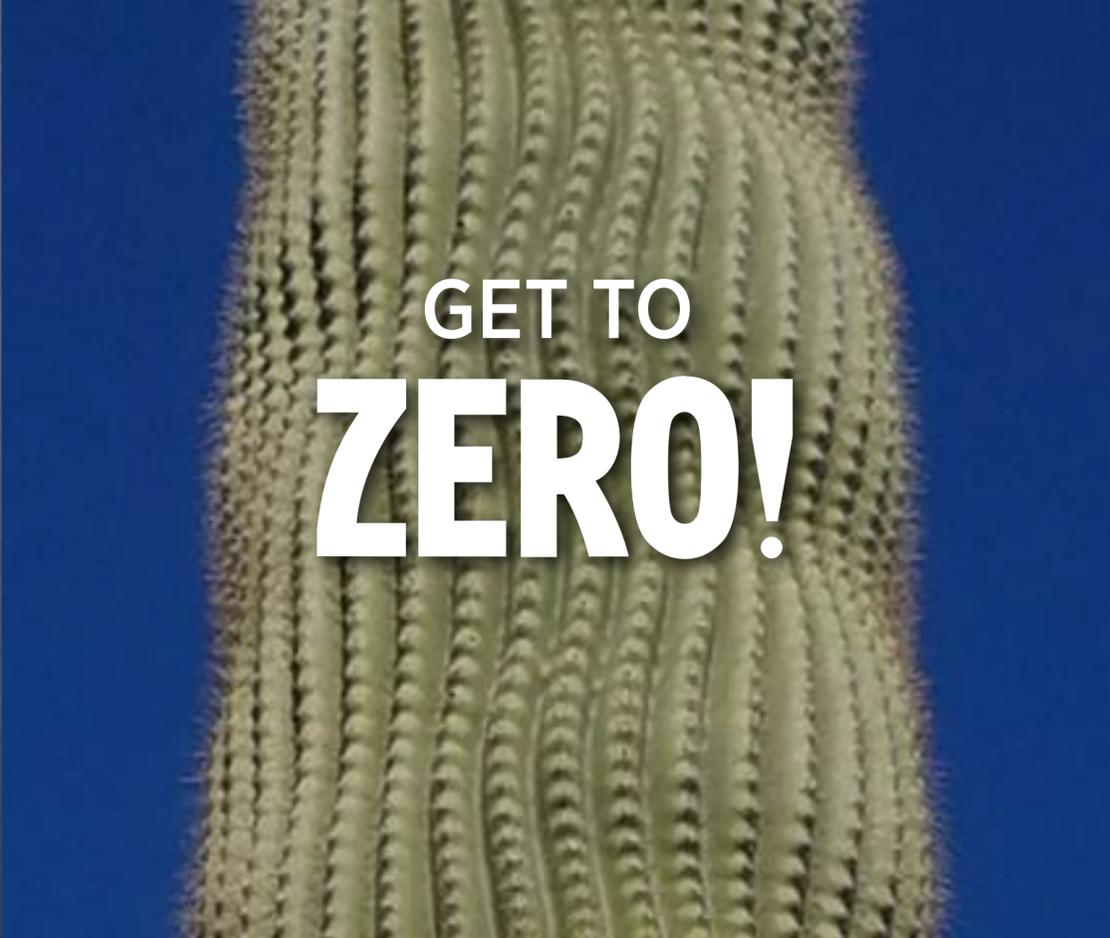


TECHNOLOGY

is needed to speed construction & reduce cost



MAKE IT
EFFICIENT!



GET TO
ZERO!



USE EVERY
TOOL!



MEASURE
EVERYTHING!



DO IT
NOW!



USE
NATURE!

text: **GREEN**
to:
206-207-5422

no data
no insights
no productivity
no automation
no prefabrication



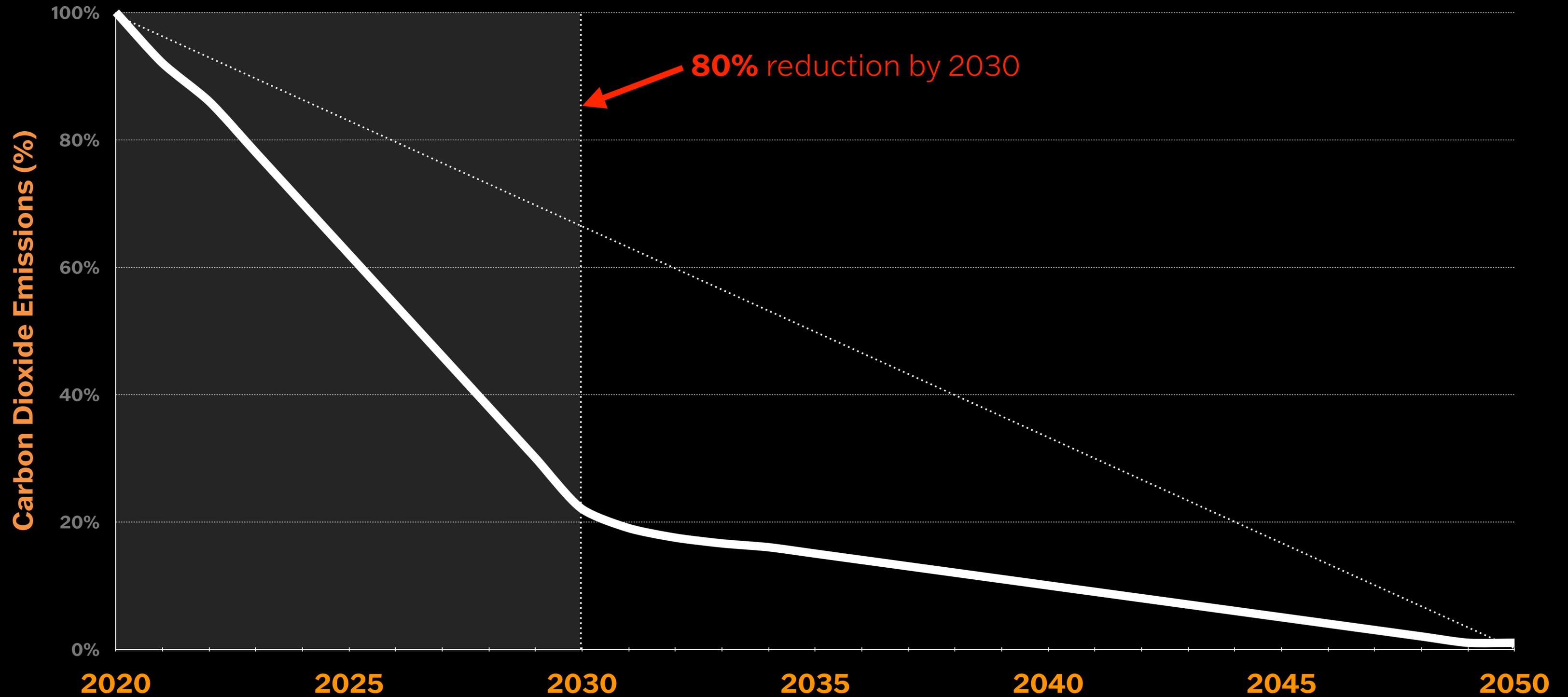
text: **GREEN**
to:
206-207-5422



Carbon Neutral by 2050 is too late!

2020 – 2050

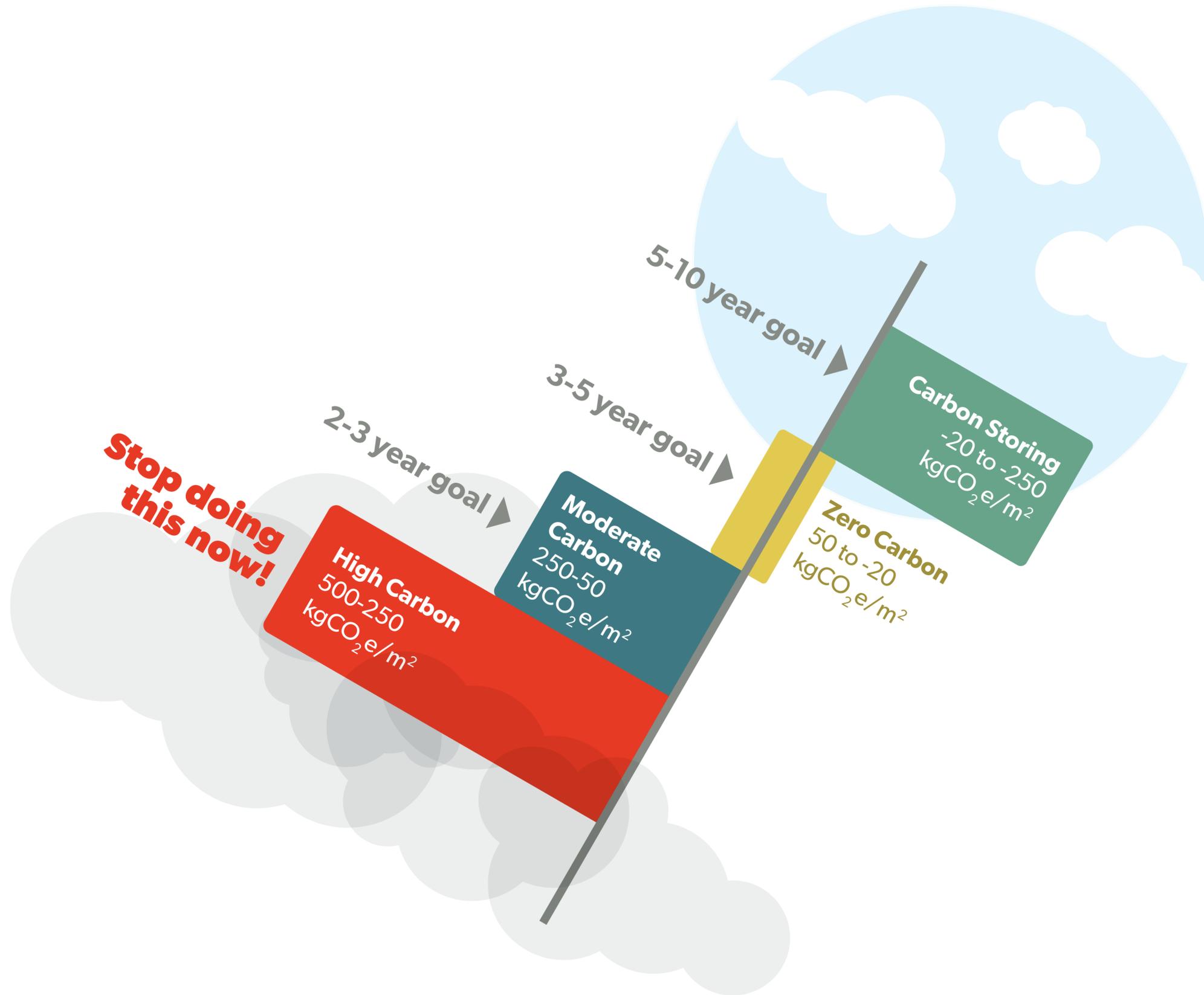
We need to cut now.





There is no time.
We have zero years.

text: **GREEN**
to:
206-207-5422



text: **GREEN**
to:
206-207-5422



text: **GREEN**
to:
206-207-5422



demolition



glass boxes



not net zero

CLIMATE DEFENIAL



redefining cost

Long Term Parking on Upper Levels

Check around METER for Hours / Rates

RESERVED PARKING
\$250 FINE

text: **GREEN**
to:
206-207-5422



\$177,000,000,000/year

\$2,641,000,000,000/total

text: **GREEN**
to:
206-207-5422



text: **GREEN**
to:
206-207-5422

coal workers: **46k**
yoga instructors: **52k**
clean energy: **3,300k**

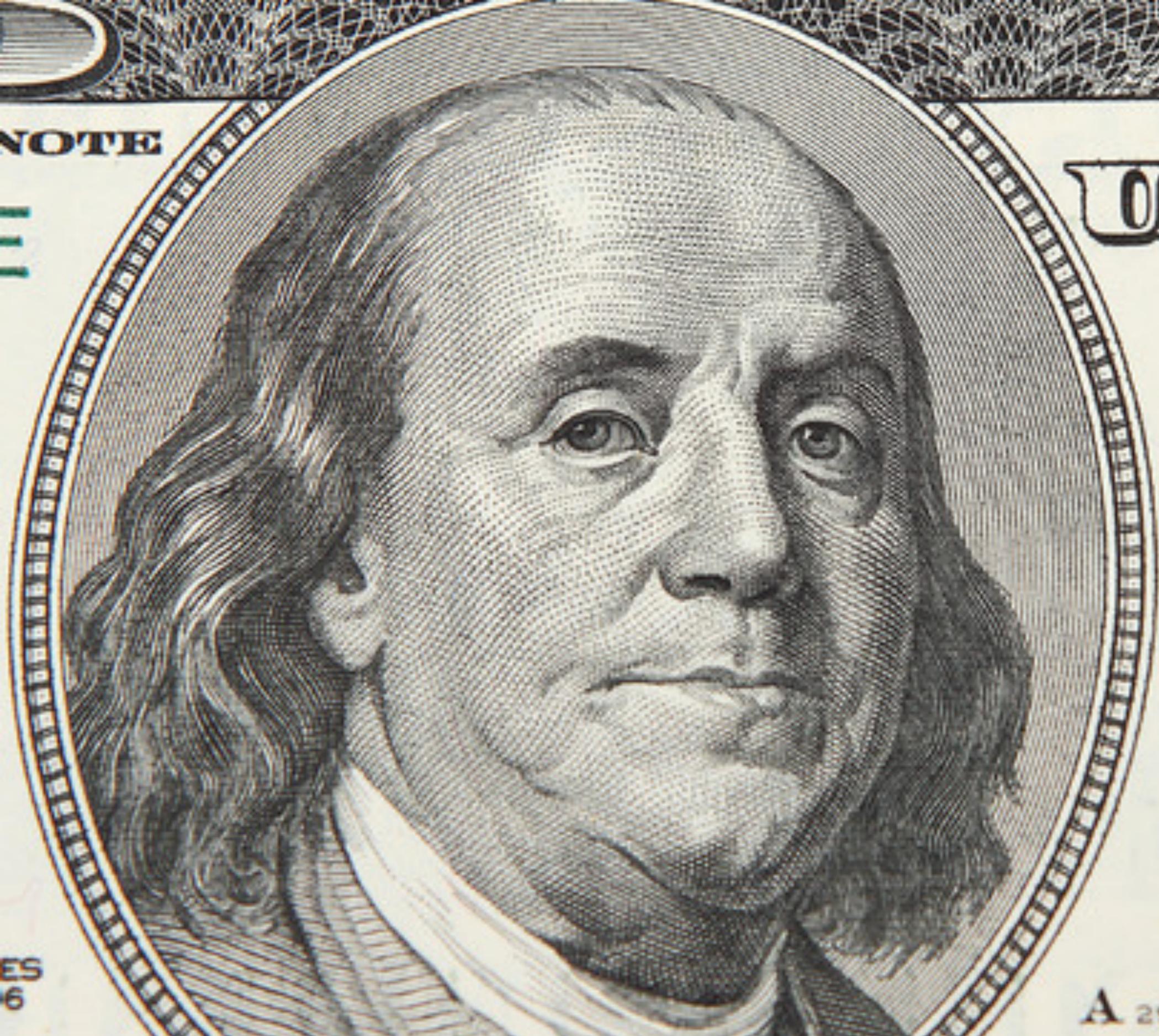


text: **GREEN**
to:
206-207-5422

NOTE

111

ES
6



ONE HUNDRED DOLLARS

100

The seal of the Department of the Treasury is positioned between the two zeros of the '100'. It features a central figure holding a scale of justice and a sword, surrounded by the words 'DEPARTMENT OF THE TREASURY' and the year '1790'. The seal is green and has a serrated edge.

HL 624318

A 293

Henry M. Paulson, Jr.
Secretary of the Treasury.



text: **GREEN**
to:
206-207-5422

stress levels decrease

emotional

higher productivity

career

stronger concentration

social

better test scores

academic

improve cognitive function

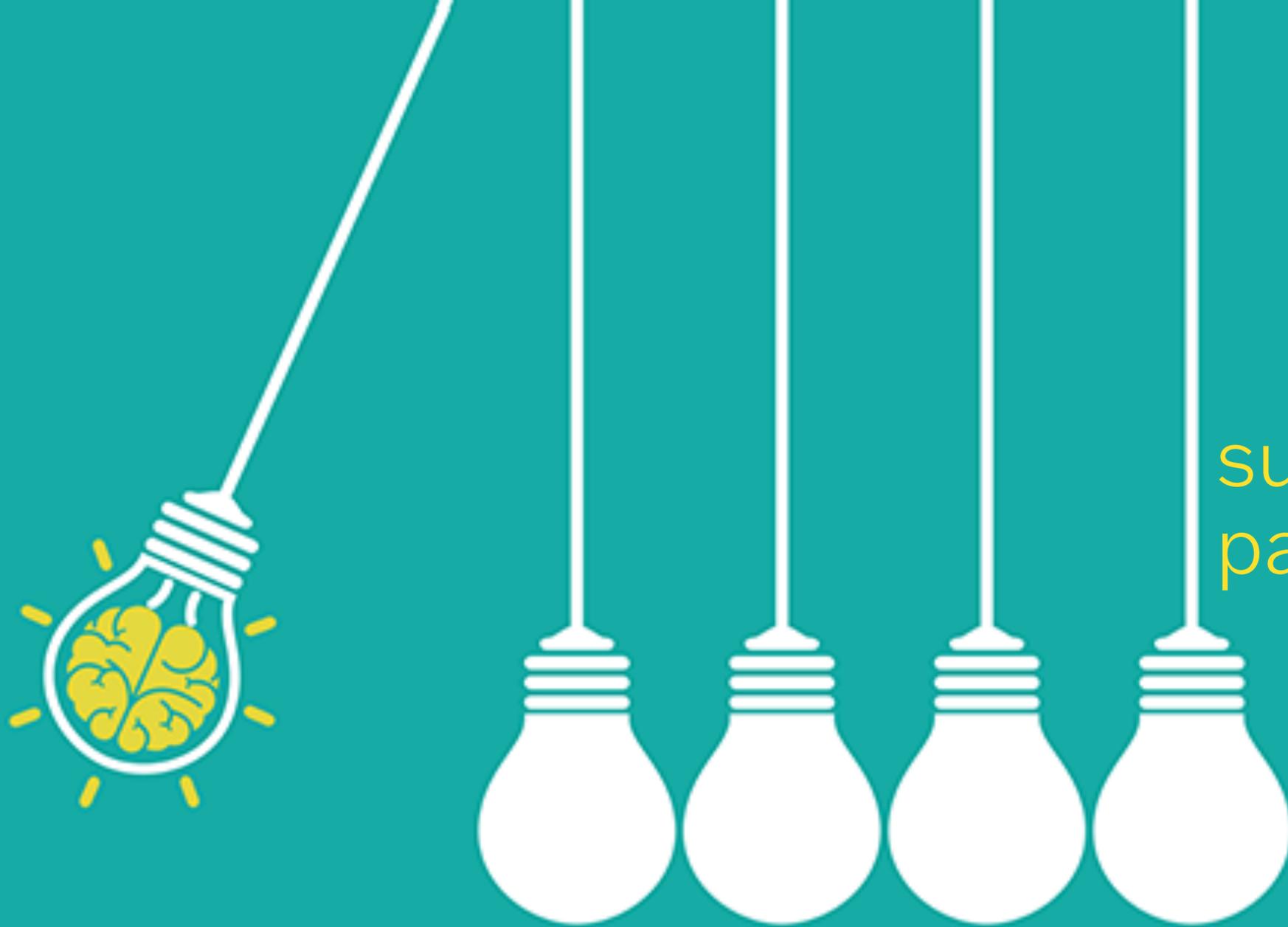
physical

boost to happiness

spiritual

increased profitability

financial



sustainability
pays for itself

text: **GREEN**
to:
206-207-5422



(not all orange slices are equal)

text: **GREEN**
to:
206-207-5422

\$10,000,000,000,000

potential savings by 2100



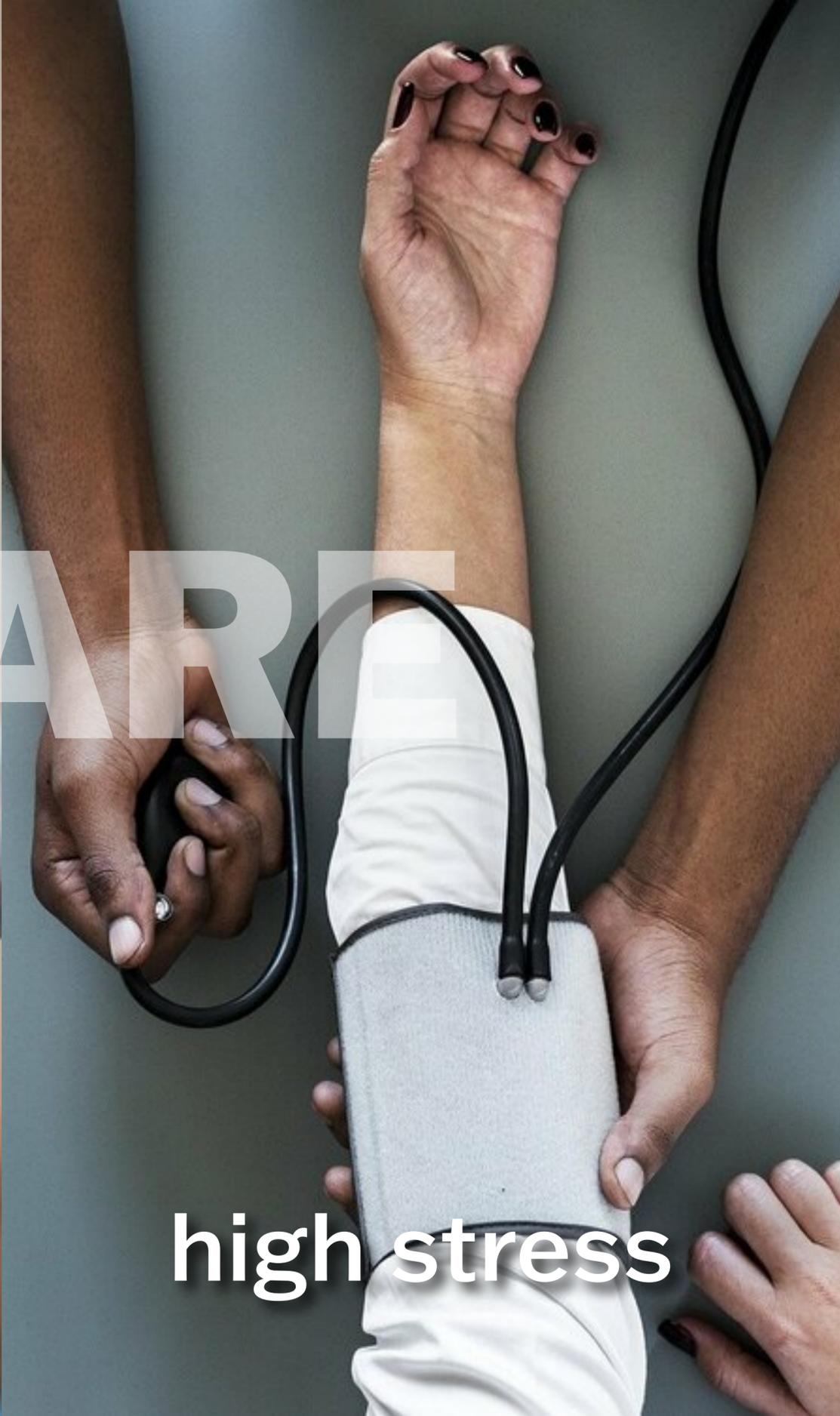
text: **GREEN**
to:
206-207-5422



long waits



low comfort



high stress

HEALTH CARE



uninspiring



poor lighting



wasteful

EDUCATION

WORKPLACE

poor air

bad light

disconnected



if we change
what we measure,
we can
change the world.

text: **GREEN**
to:
206-207-5422

how do we measure the success of buildings?



cost/sf



revenue/sf



payback

how should we measure success?



recovery



stress reduction



staff retention

how could we measure success?



kW energy generated



tons of CO₂ removed



of species supported



infection control



occupant comfort



acoustics



student test scores



employee retention



dust control

text: **GREEN**
to:
206-207-5422

LEED
evidence-based
repairable
mindful materials
cradle to cradle
Fitwel
offgassing
recycled
mM
WELL
red list
IAQ
HPD
formaldehyde
EPD

wellness
natural
Fitwel
repairable
MSDS
IAQ
mM
reclaimed
transparency
mM
declare
HPD
transparency
biobased

reusable
declare
MSDS
mM
ventilation
biobased
sustainably harvested
LEED
biophilia
reclaimed
IAQ
formaldehyde
greenguard

red list
zero VOC
Fitwel
MSDS
mM
circular
greenguard
declare

reclaimed
durable
natural
recycled
natural
reusable
sustainably harvested
EPD
lifecycle

mM
lifecycle
declare
recyclable
biophilia
IAQ
organic
compostable
ventilation
recyclable
WELL

WELL
HPD
reusable
WELL
zero VOC
circular
organic
wellness
red list
LEED
zero VOC
reclaimed
IAQ

AIR

Carbon Dioxide (CO₂) (ppm)

Carbon Monoxide (CO) (ppm)

Total VOCs (ug/m³)

Formaldehyde (HCHO) (ug/m³)

Nitrogen (NO₂) (ug/m³)

Ozone (O₃) (ug/m³)

PM2.5 (ug/m³)

PM10 (ug/m³)

Air Quality Index (0-500)

Air Changes (ACH) (cfm/ft³)

Fresh Air Intake (cfm/person)

Air Pressure (mb)

Dust (ug/m³)

CLIMATE

pEUI (kBtu/feet²/yr)

Carbon Use Intensity (CO₂/Btu)

Embodied Carbon (kgCO₂e/m³)

Global Warming Potential (IPCC AR4)

Carbon Emissions (CO₂) (kg)

Methane Emissions (CH₄) (kg)

Fluorocarbons (CFC/HCFC) (kg)

Production (kW)

Net Zero Site (kW)

Net Zero Source (kW)

Offsets (tonnes CO₂e)

SPATIAL

Temperature (°F/°C)

Relative Humidity (%)

Noise (dB)

Irradiance (mV)

Illuminance (mV)

Illumination (lumens/lux)

Daylight Factor (%)

Lead Exposure (mcg/dL)

Asbestos (f/cc)

Radon (pCi/L)



WHAT CLIENTS CARE ABOUT

Capital Expenditure (CapEx) (\$)

Return on Investment (ROI) (months)

Rate of Return (ROR) (%)

Internal Rate of Return (IRR) (%)

Modified Internal Rate of Return (MIRR) (%)

Net Present Value (NPV) (\$)

Time Value of Money (TVM) (\$)

Weighted Average Cost of Capital (WACC) (\$)

Revenue per Square Foot (RevSF) (\$/foot²)

Revenue per Available Room (RevPAR) (\$/unit)

Average Daily Rate (ADR) (\$/day)

Occupancy Rate (OR) (%)

Lease Rate (LR) (%)



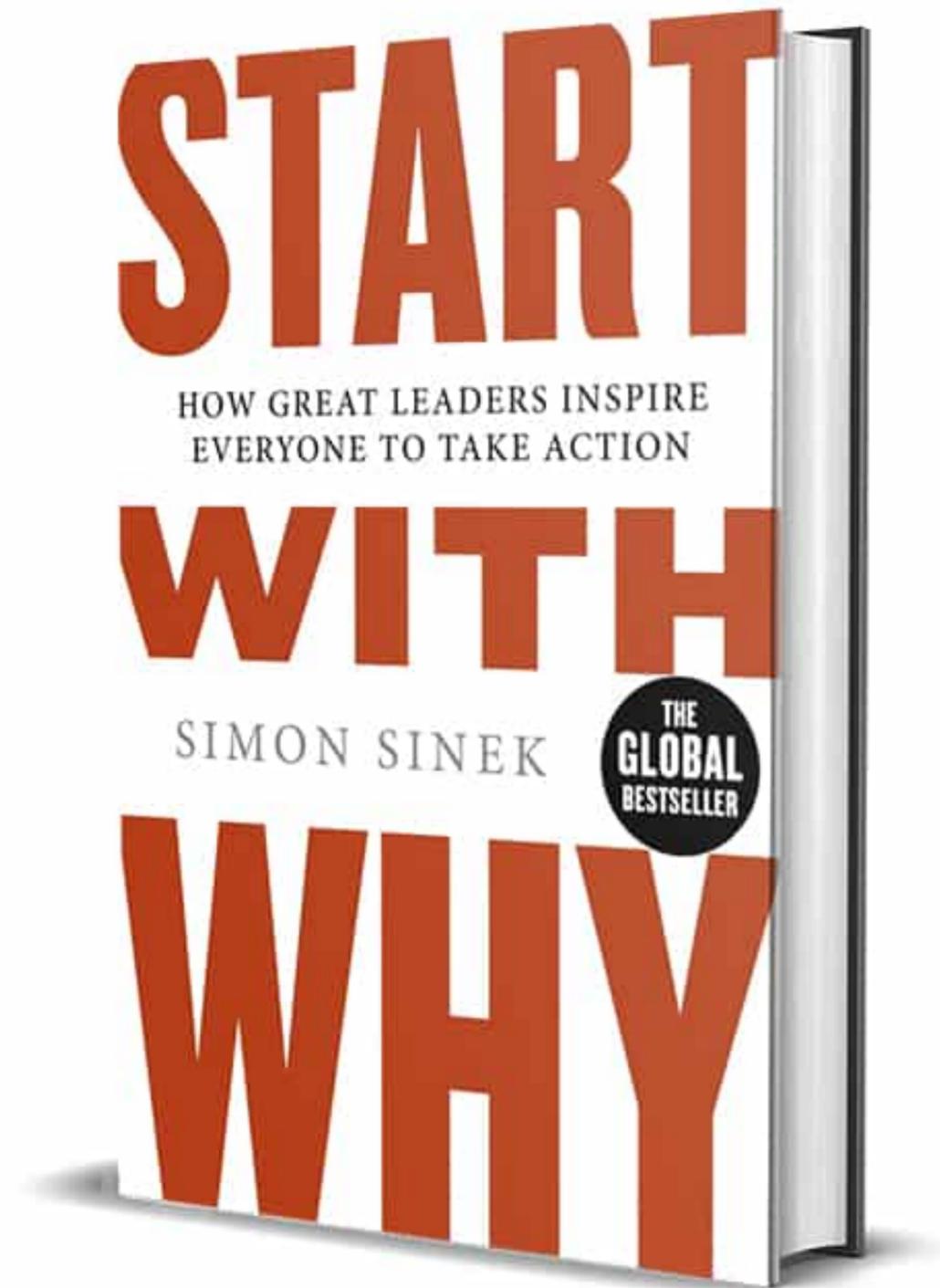
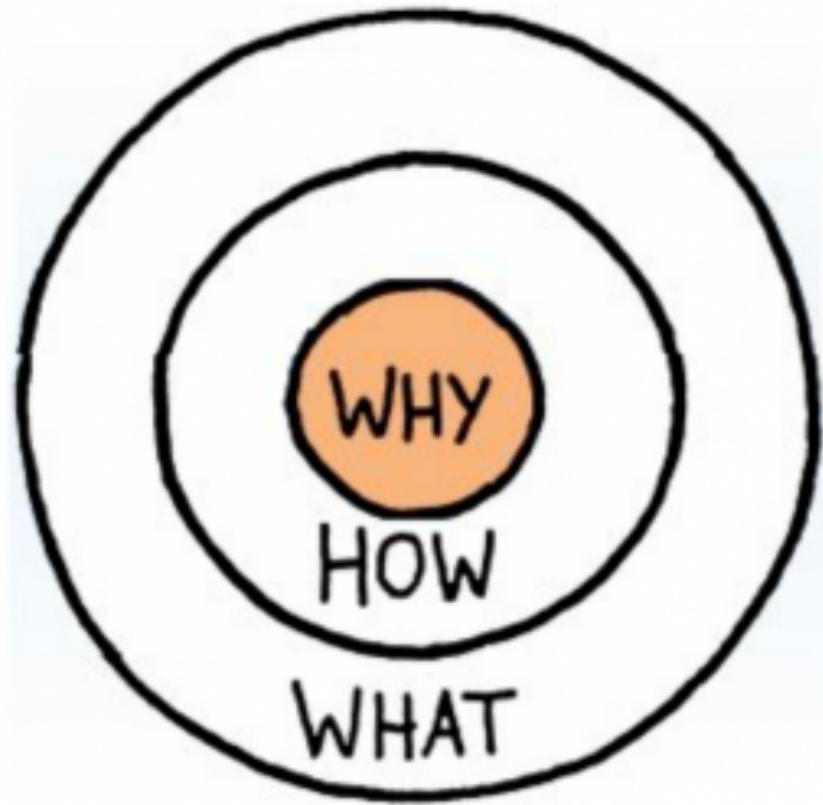
our metrics of success are

WRONG



**DESIGN
TO
OUTCOMES**

THE MISSING LINK



VIBRANCY

Resiliency

Stronger value chains

Higher Walkability

Access to green space

Views of nature

Redlist free

Waste reduction

Guest satisfaction

Reduced pain meds

Faster immune response

Reduced length of stay

Engaged stakeholders

PROSPERITY

Circularity

Increased valuation

Share price

Reduced Risk

Divestment

Impact investment

Access to capital

Social capital

Reduced overhead

Civic participation

Graduation rates

College acceptance

PERFORMANCE

Staff Retention

Student test scores

Reading comprehension

Worker productivity

Transparency

Revenue per Employee

Number of Applicants

Climate Targets

Staff diversity

Lower Absenteeism

Rates of Advancement

Lower commuting time

Loss prevention

VIBRANCY

Resiliency

Stronger value chains

Higher Walkability

Access to green space

Views of nature

Redlist free

Waste reduction

Guest satisfaction

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PERFORMANCE

Staff Retention

Student test scores

Reading comprehension

Worker productivity

Transparency

Revenue per Employee

Number of Applicants

Climate Targets

Staff diversity

Lower Absenteeism

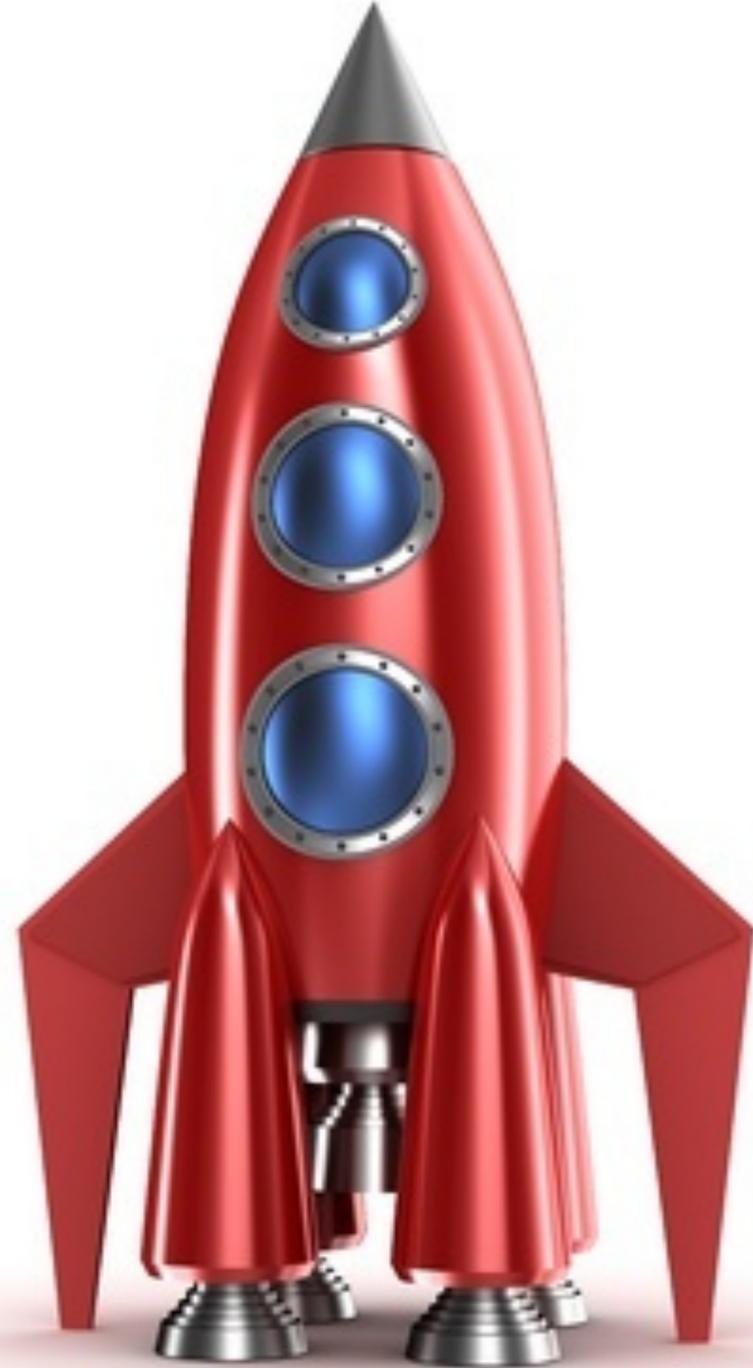
Rates of Advancement

Lower commuting time

Loss prevention



innovation approach



you have to
CHOOSE
innovation

text: **GREEN**
to:
206-207-5422

An aerial photograph of a snow-covered mountain slope. A large, dense cloud of snow is cascading down the center of the slope, illustrating an avalanche. The surrounding snow is uneven, with some rocky outcrops visible. The overall scene is bright and high-contrast.

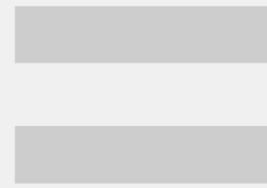
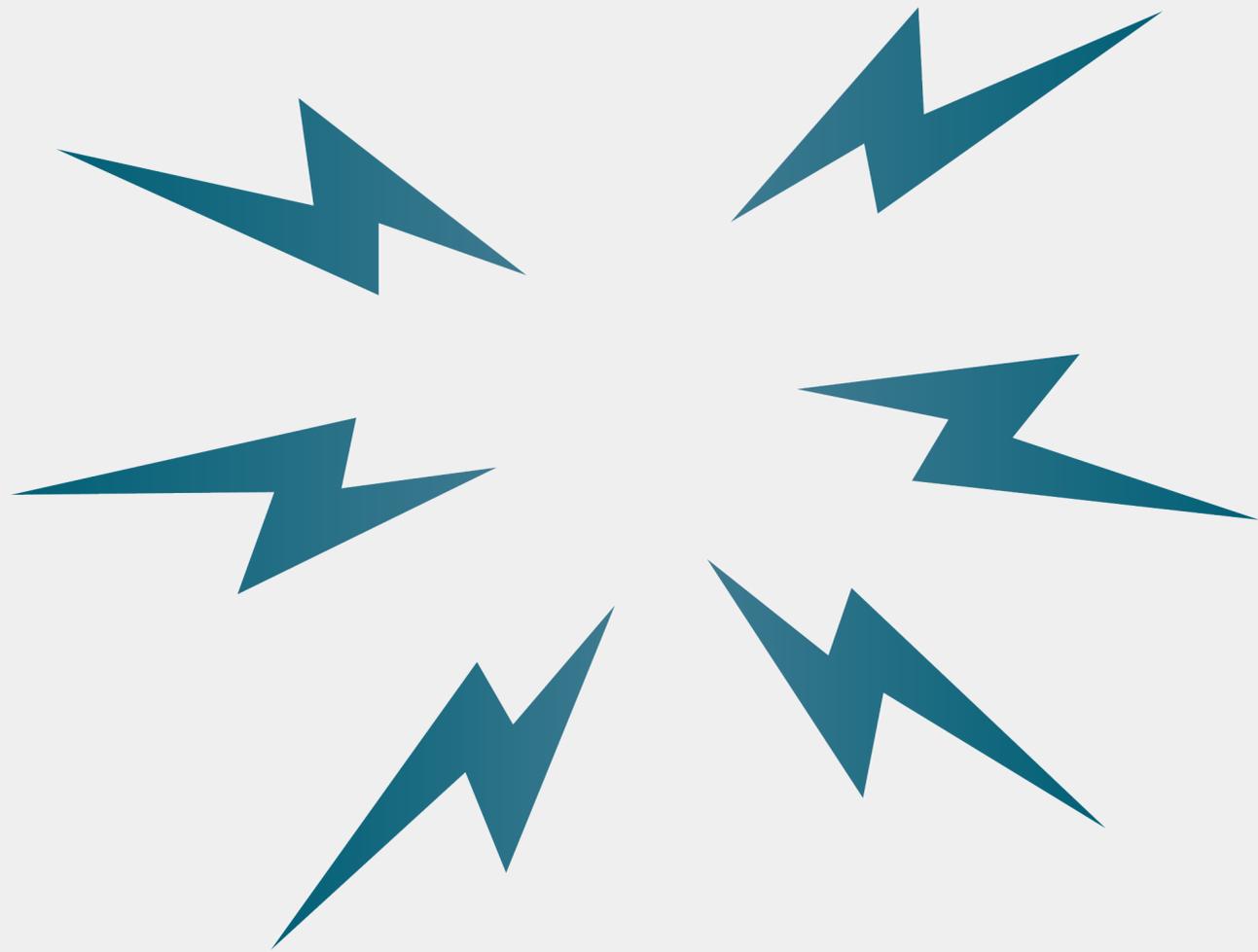
innovation is an
AVALANCHE



CANNONDESIGN



MOST
INNOVATIVE
COMPANY



CAMRY



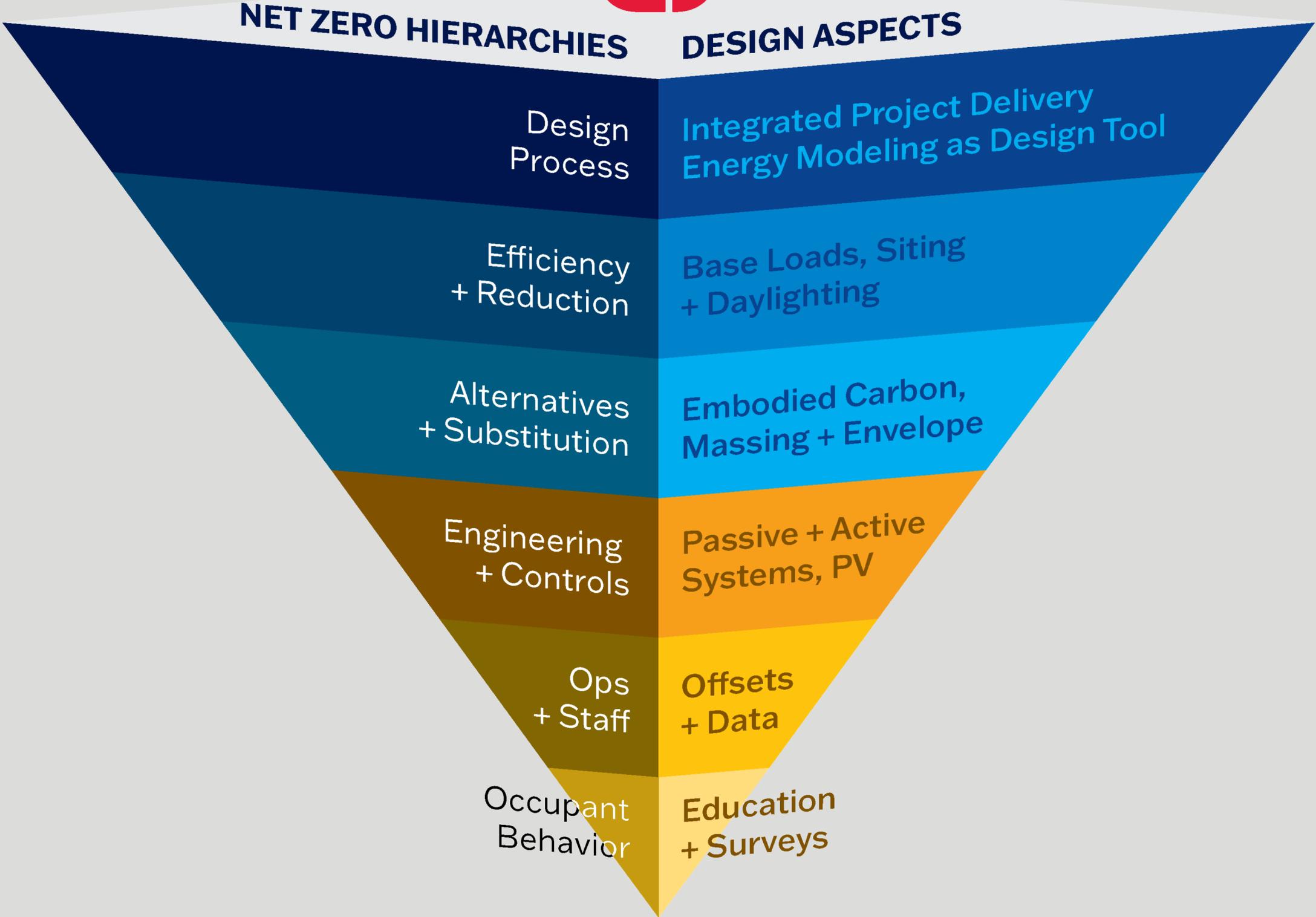
PRIUS

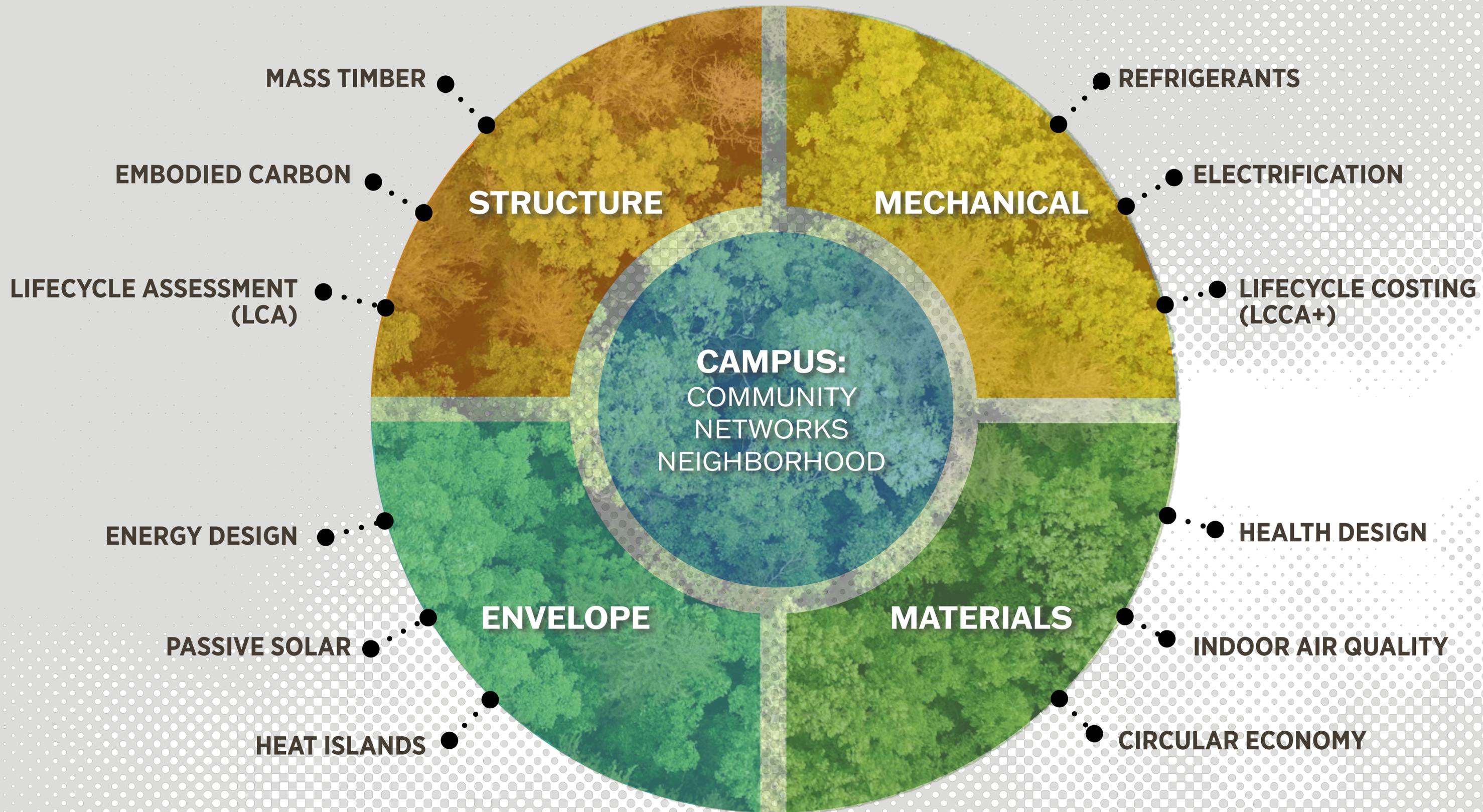



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Pathways to Net Zero.





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