

Boom or Bust?

*Climate Change
Risks and Opportunities*

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The Global Problem



The Global Opportunity



Global Warming is Not a New Idea

THE
LONDON, EDINBURGH, AND DUBLIN
PHILOSOPHICAL MAGAZINE
AND
JOURNAL OF SCIENCE.

[FIFTH SERIES.]

APRIL 1896.

XXXI. *On the Influence of Carbonic Acid in the Air upon the Temperature of the Ground.* By Prof. SVANTE ARRHENIUS*.

I. *Introduction: Observations of Langley on Atmospheric Absorption.*

A GREAT deal has been written on the influence of the absorption of the atmosphere upon the climate. Tyndall† in particular has pointed out the enormous importance of this question. To him it was chiefly the diurnal and annual variations of the temperature that were lessened by this circumstance. Another side of the question, that has long attracted the attention of physicists, is this: Is the mean temperature of the ground in any way influenced by the presence of heat-absorbing gases in the atmosphere? Fourier‡ maintained that the atmosphere acts like the glass of a hot-house, because it lets through the light rays of the sun but retains the dark rays from the ground. This idea was elaborated by Pouillet§; and Langley was by some of his researches led to the view, that “the temperature of the earth under direct sunshine, even though our atmosphere were present as now, would probably fall to -200° C., if that atmosphere did not possess the quality of selective

* Extract from a paper presented to the Royal Swedish Academy of Sciences, 11th December, 1895. Communicated by the Author.

† ‘Heat a Mode of Motion,’ 2nd ed. p. 495 (Lond., 1865).

‡ *Mém. de l’Ac. R. d. Sci. de l’Inst. de France*, t. vii. 1827.

§ *Comptes rendus*, t. vii. p. 41 (1838).

*“On the Influence
of Carbonic Acid
in the Air upon
the Temperature
of the Ground”*

By Prof. Svante Arrhenius

April 1896

Risks



©beasubido



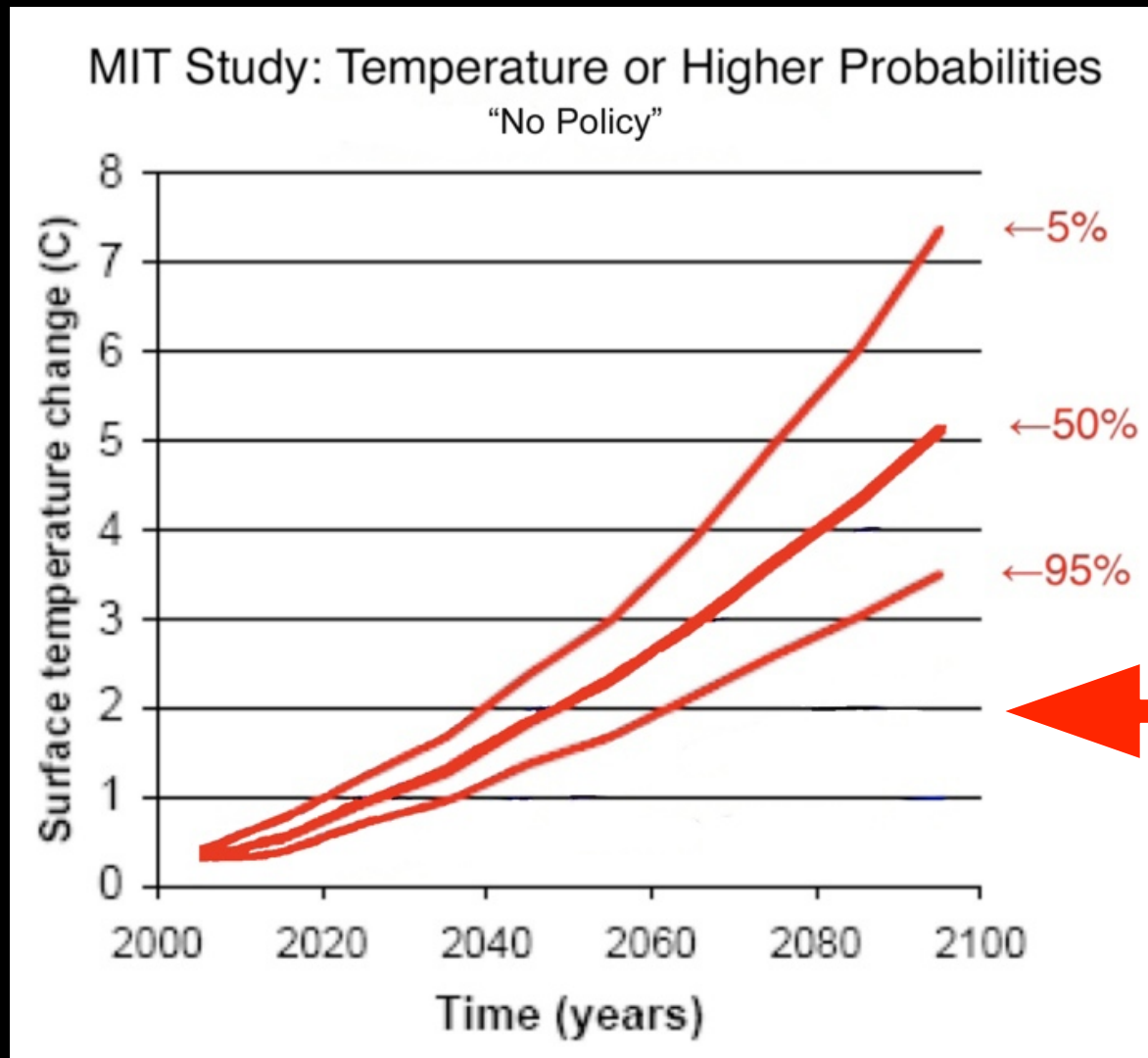
Photo by Morning Calm News



Photo by Vermin Inc.



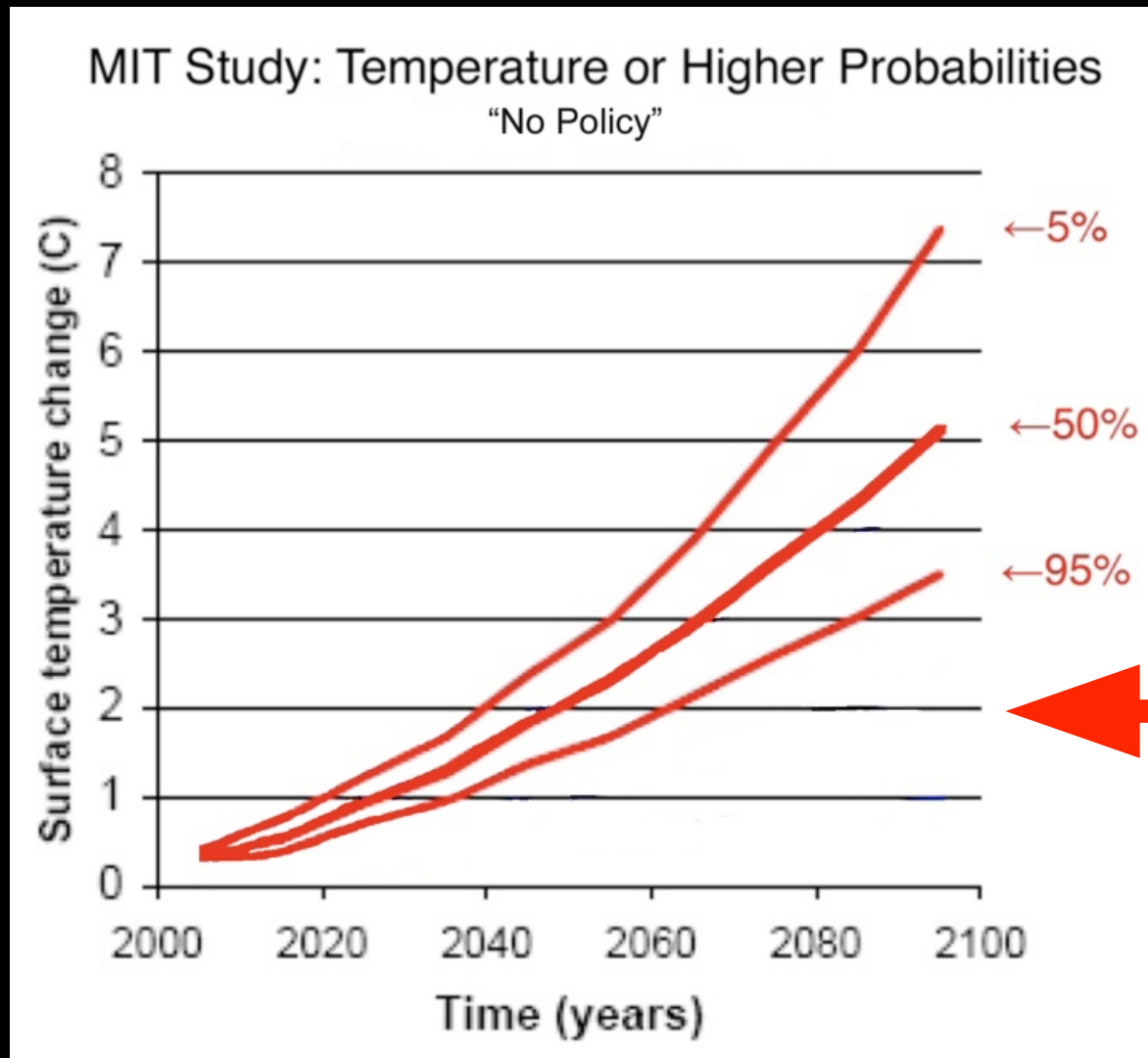
MIT Temperature Study



2009 MIT Study:
95% chance that
"Business-as-usual"
temperature
increase will *exceed*
3.5°C (6.3°F) in 2095



MIT Temperature Study

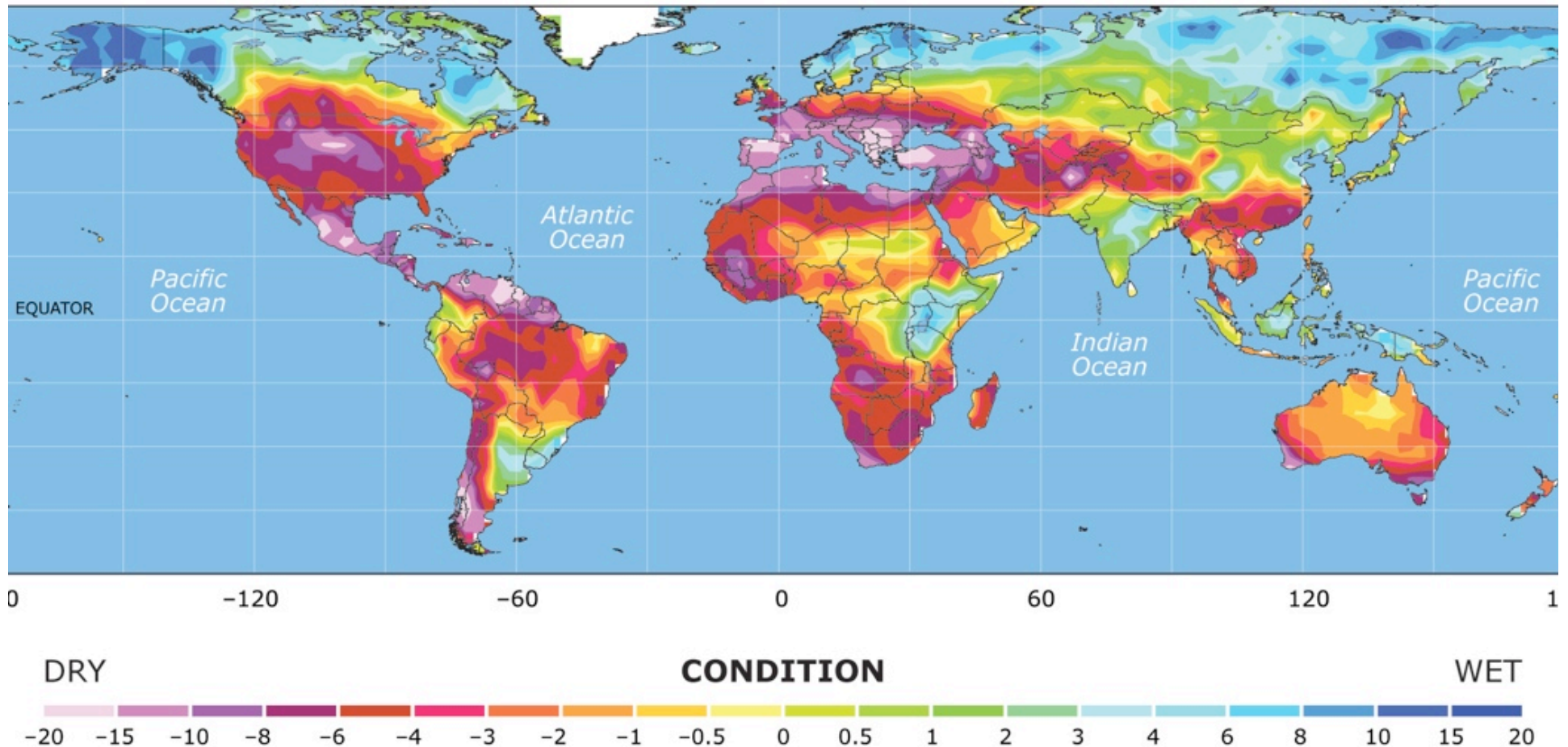


and a **50% chance**
that temperature will
exceed 5°C (9°F)!



The Near Future

2060–2069



Drought Index: -3 to -6 = Dust Bowl

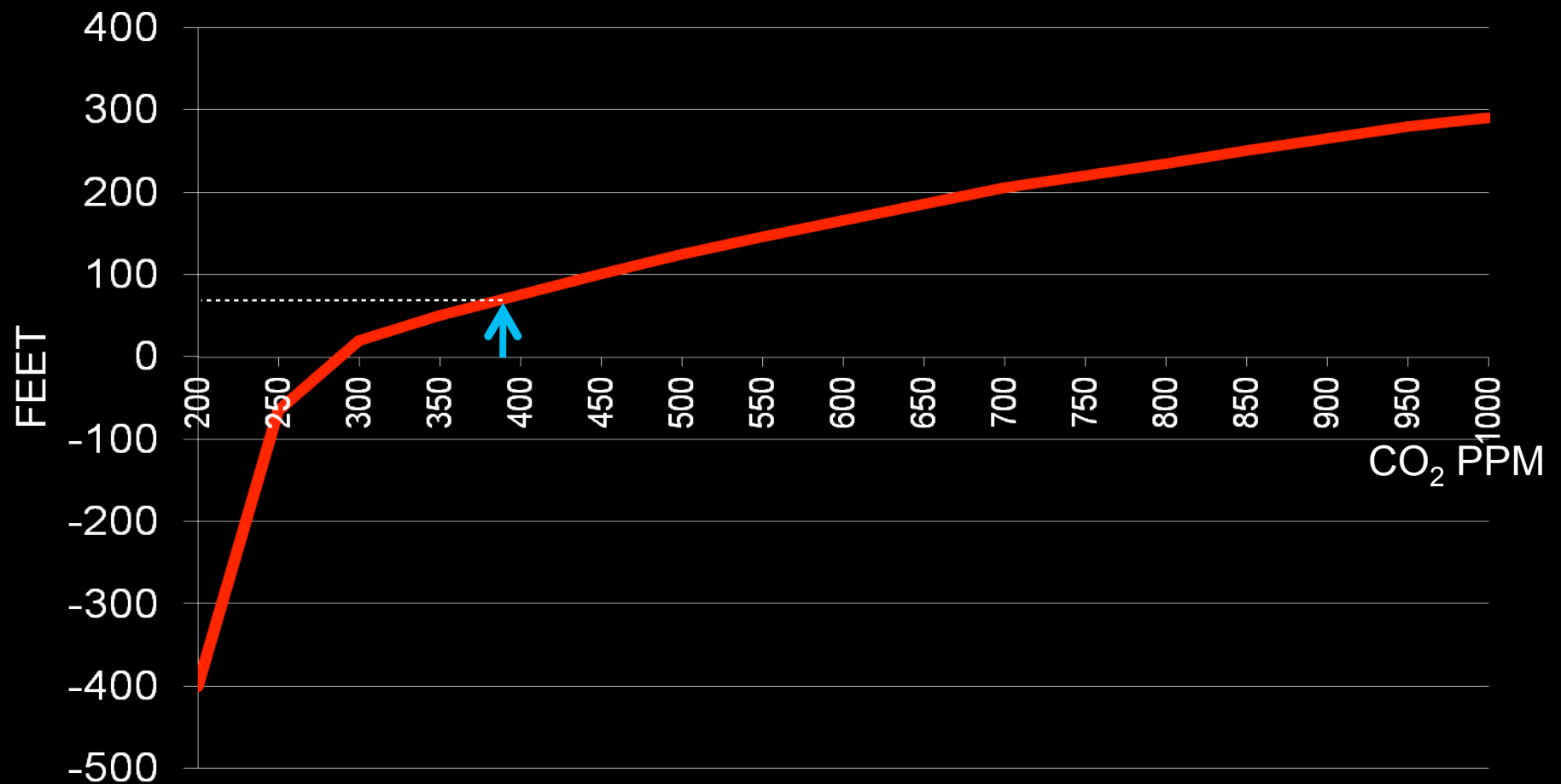
Source: University Corporation for Atmospheric Research

Sea Level Rise



Oceans Will Rise

Based on Actual Historical Data – Not Models





Permafrost

Other Dangers: *All Already Happening*

- Reduction of ocean's ability to absorb CO₂ & acidification
- Collapse of forests / increased wild fires
- Spread of deserts
- Mega-droughts and floods
- Mass extinctions
- More extreme weather
- Reduction in global food production





Potential Impacts

- Wars over resources
- Abandonment of many major cities
- Massive shortages of food and water
- Collapse of economies
- Runaway greenhouse effect: Venus Syndrome



GLOBAL
WARMING
READY

DIESEL
The Art of Dressing

Why Don't We Act?

Failure of the "Risk Thermostat"

We respond strongest to threats that are:	Climate Change is:
Visible	Invisible
With historical precedent	Unprecedented
Immediate	Drawn out
With simple causality	With complex causality
Have direct personal impacts	Unpredictable & indirect impacts
Caused by another "tribe" (enemy)	Caused by all of us

Denial Strategies

Displaced commitment	"I protect the environment in other ways"
Condemn the accuser	"You have no right to challenge me"
Denial of responsibility	"I am not the main cause of this problem"
Rejection of blame	"I have done nothing wrong"
Ignorance	"I didn't know"
Powerlessness	"I can't make any difference"
Fabricated constraints	"There are too many impediments"
After the flood	"Society is corrupt"
Comfort	"It's too hard for me to change my behavior"

Other Denial Strategies

- We think of it as an *environmental* issue
- We deliberately maintain a level of ignorance
- We wait for someone else to act first - the “passive bystander effect”
- Societies develop strategies to avoid action
 - We place it outside our “norms of attention”
 - Define it as “far away” - global - not local; future - not now

What to Do?

What Can You Do?

1. Ask your children for forgiveness
2. Reduce your carbon footprint
- 3. Believe, learn, engage**
4. Get your family, friends & colleagues engaged
- 5. *Talk to your elected leaders and get involved***

What Can Countries Do?

1. Move to 100% carbon-free electricity generation in 10~20 years (i.e., ban coal)
2. Keep tar-sands and oil shale in the ground
3. Expand research into “geo-engineering”
4. *Put a price on carbon...*

Clean Energy Dividend

- Put an increasing fee on CO₂ at the wellhead, mine, and port
 - Enough to increase price of gasoline by \$1+/gallon
- Distribute 100% of the money collected to every citizen on a per-capita basis
 - Paid monthly, ½ shares for up to 2 children
- Most people will earn more each year (~\$3000) than they pay in higher energy costs

An Economic Boom

- Putting a significant price on CO₂ will drive innovation and investment in renewable energy and energy efficiency
- Will trigger an economic boom that will put the Internet revolution to shame
- Will also improve energy security and eliminate the need to fight wars over oil

Jobs. Jobs. Jobs.

- We'll keep the \$500B+ we send to the Middle East in this country, creating millions of jobs.
 - These jobs will have a multiplicative effect
- From 1998 to 2007, clean energy economy jobs grew 9.1% vs. 3.7% for traditional jobs (Pew Charitable Trusts research)
- Cleantech is currently one of the few growing areas in the California economy

...Or Bust, If We Fail to Act

- International Energy Agency:
 - We have 5 years left to change our energy infrastructure
 - Otherwise we will “lose forever” the chance to avoid dangerous climate change
 - We are on track for 11°F warming

Some Good News

- We can still avoid the worst effects of climate change
 - But must act now
 - Move back to 350 ppm (from 390 now)
- Transitioning to a low-carbon world is the biggest economic opportunity ever!

For More Information

Please visit:

www.ClimatePlace.org