

WHACK!

Svante Arrhenius
1859-1927



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).

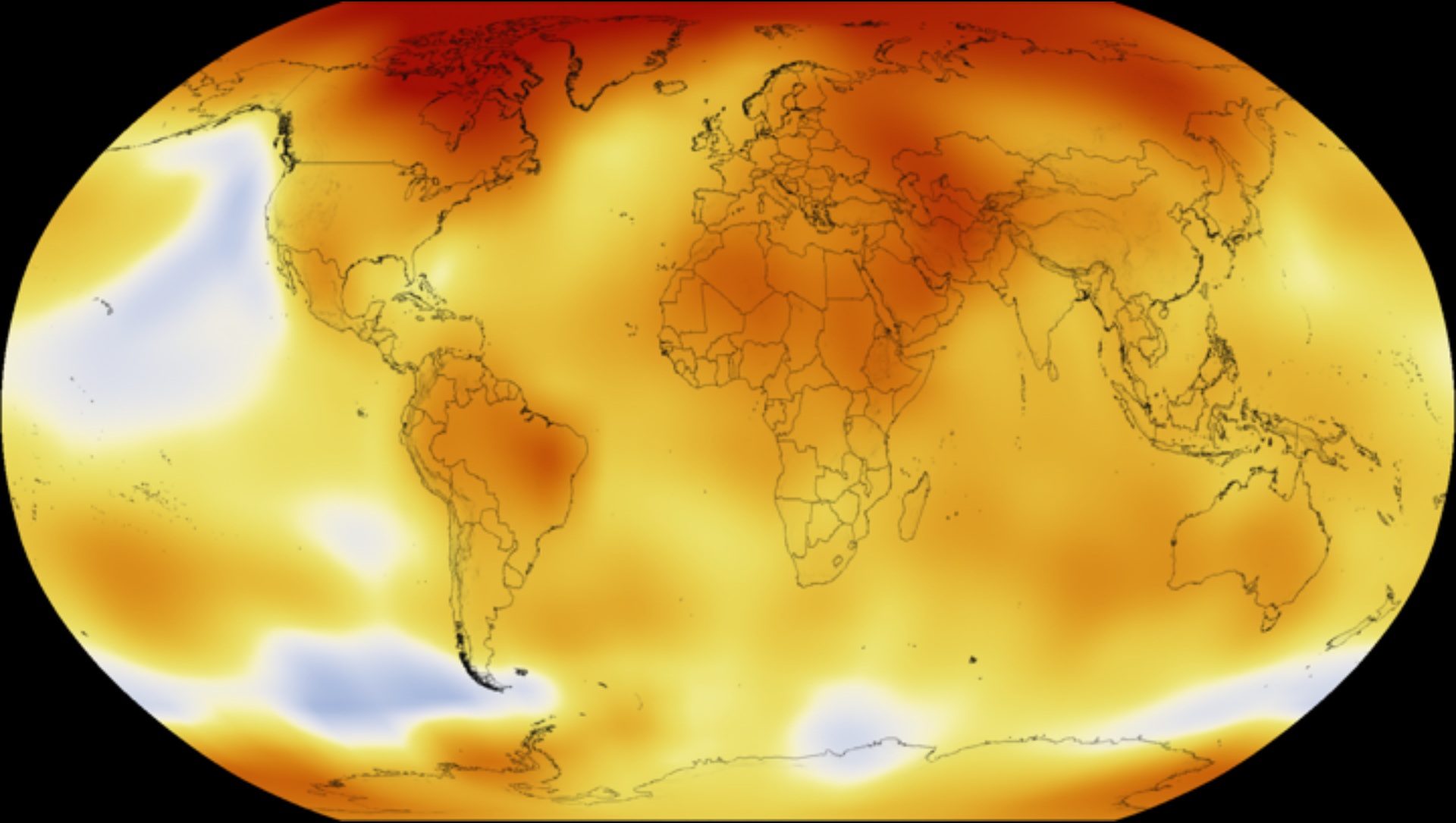
‡ *Mém. de l’Ac. R. d. Sci. de l’Inst. de France*, t. vii. 1827.

§ *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.



Credit: NASA

1958 (56 Years Ago)...

Unchained Goddess Video

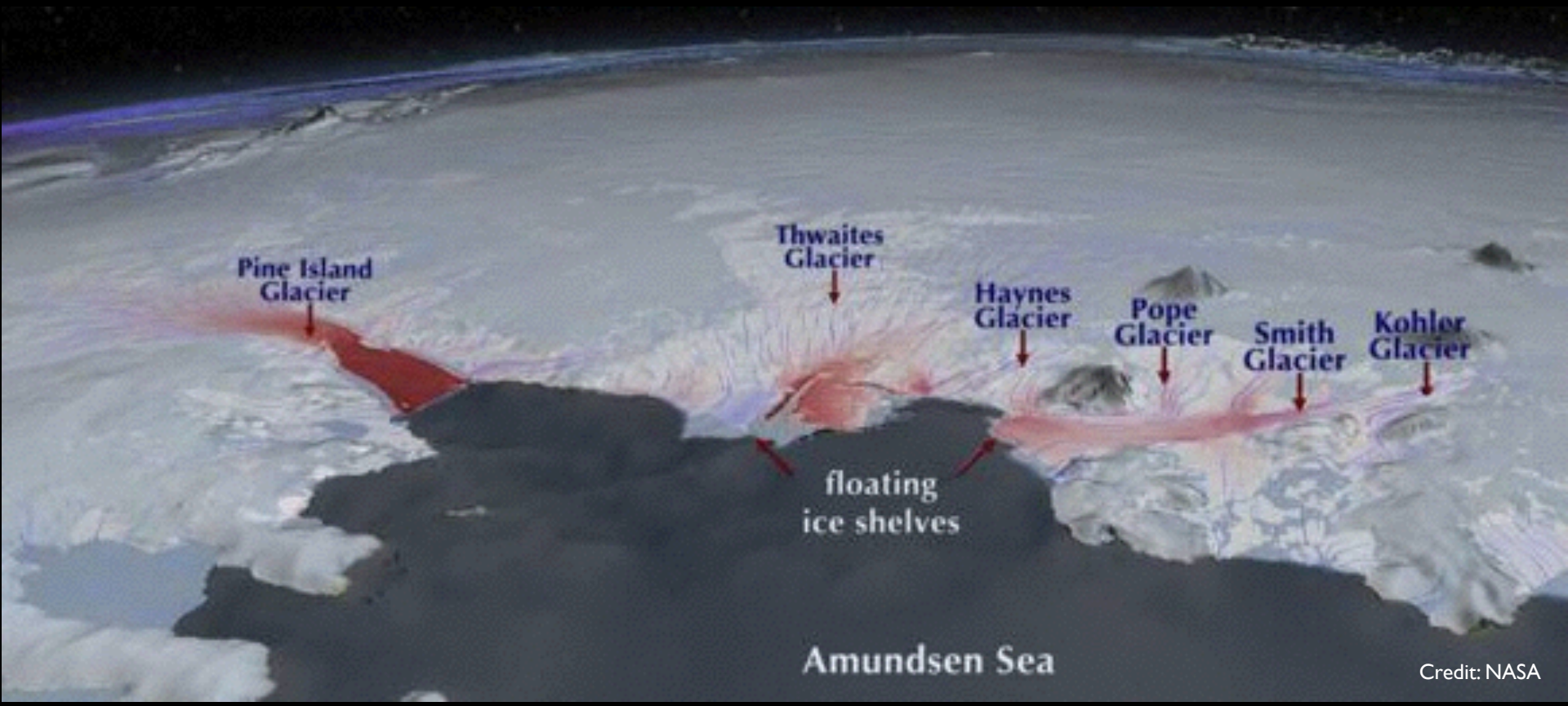
<https://www.youtube.com/watch?v=0lgzz-L7GFg>



Every major scientific academy in the world agrees
that global warming is real,
is mostly caused by humans,
and requires urgent action

We Have Officially Crossed a
Climate Tipping Point

“Unstoppable” Loss of West Antarctic Glaciers

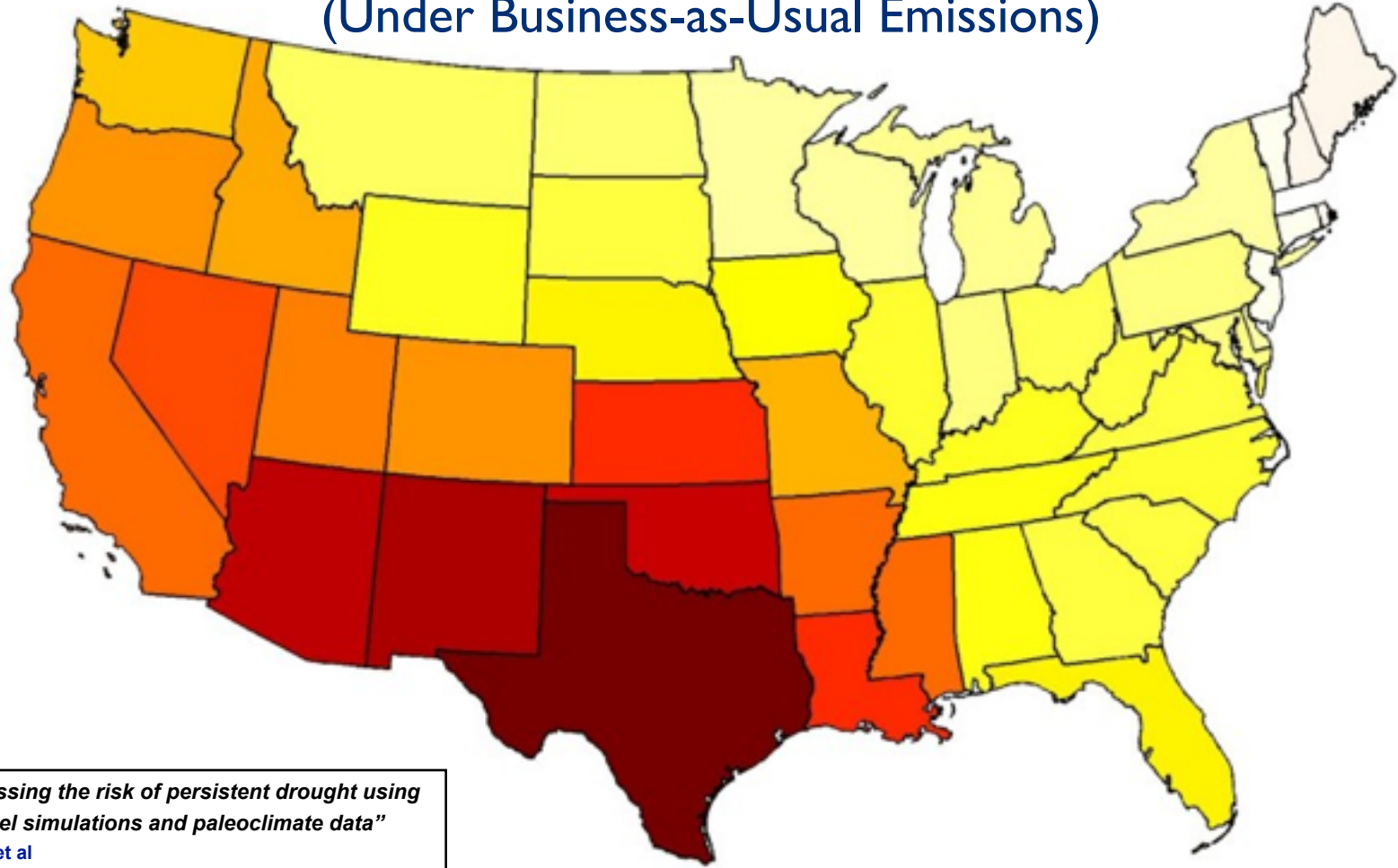


100~300 Years From Now



Risk of a Decade-long Mega-drought

(Under Business-as-Usual Emissions)



From "Assessing the risk of persistent drought using climate model simulations and paleoclimate data"
Toby R. Ault, et al





**CO₂ is Unlike
Other
Pollutants**

We are all in denial



GLOBAL
WARMING
READY

DIESEL

Threat Indicators

We respond to threats that are:	Climate change is:
Visible	Invisible

Threat Indicators

We respond to threats that are:	Climate change is:
With Historical Precedent	Unprecedented

Threat Indicators

We respond to threats that are:	Climate change is:
Immediate	Drawn Out

Threat Indicators

We respond to threats that are:	Climate change is:
Have Direct Personal Impacts	Unpredictable & Indirect Impacts

Threat Indicators

We respond to threats that are:	Climate change is:
Simple Causality	Complex Causality

Threat Indicators

We respond to threats that are:	Climate change is:
Caused by an Enemy	Caused by All of Us

Denial Strategies

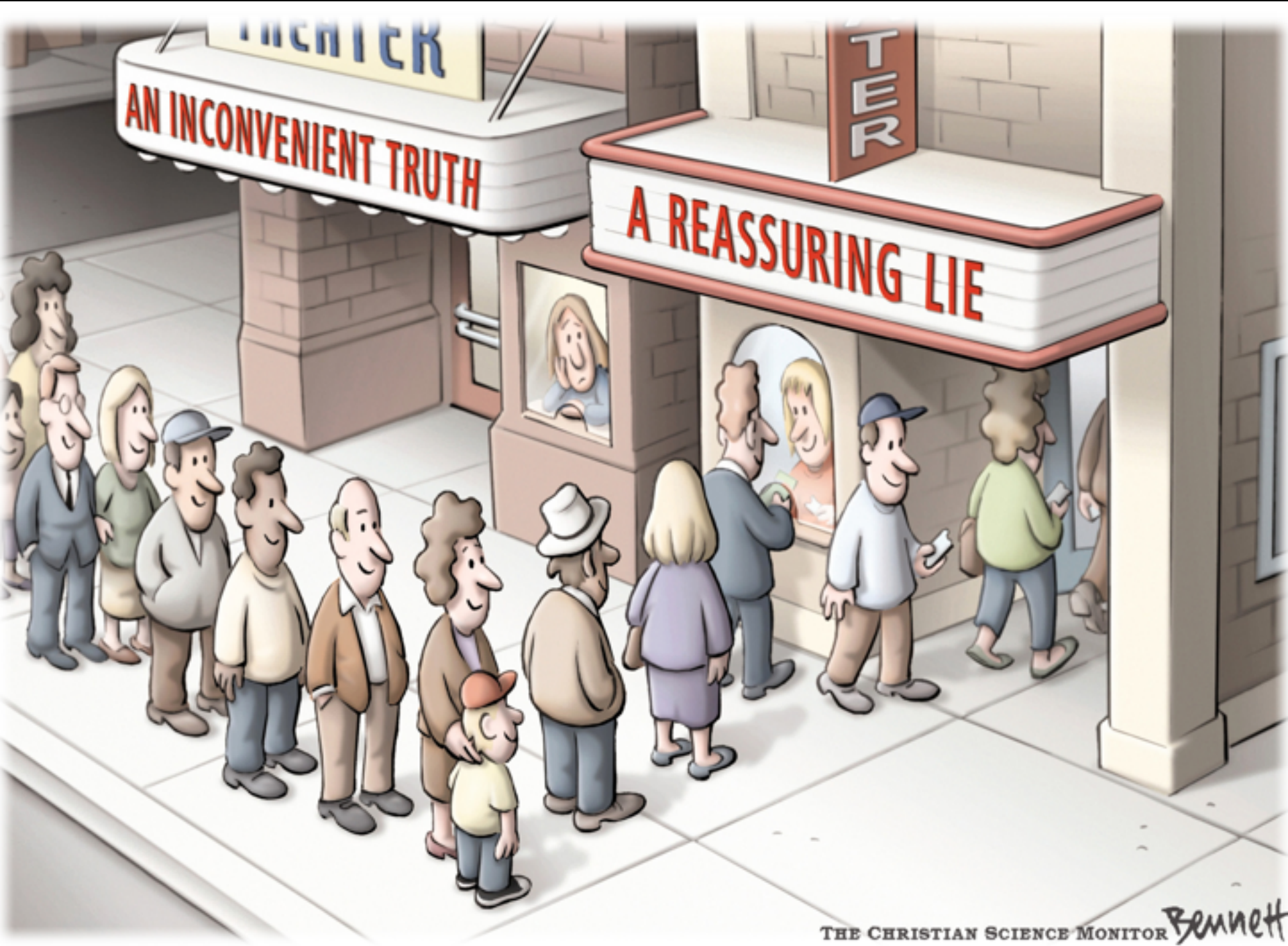
- We think of it as an *environmental* issue

Denial Strategies

- Society sets it outside our “norms of attention”
 - we make it impolite to talk about

Denial Strategies

- We wait for someone else to act first
— the “passive bystander effect”



What to Do?



The Solution:

Fee and Dividend

How Fee and Dividend Works



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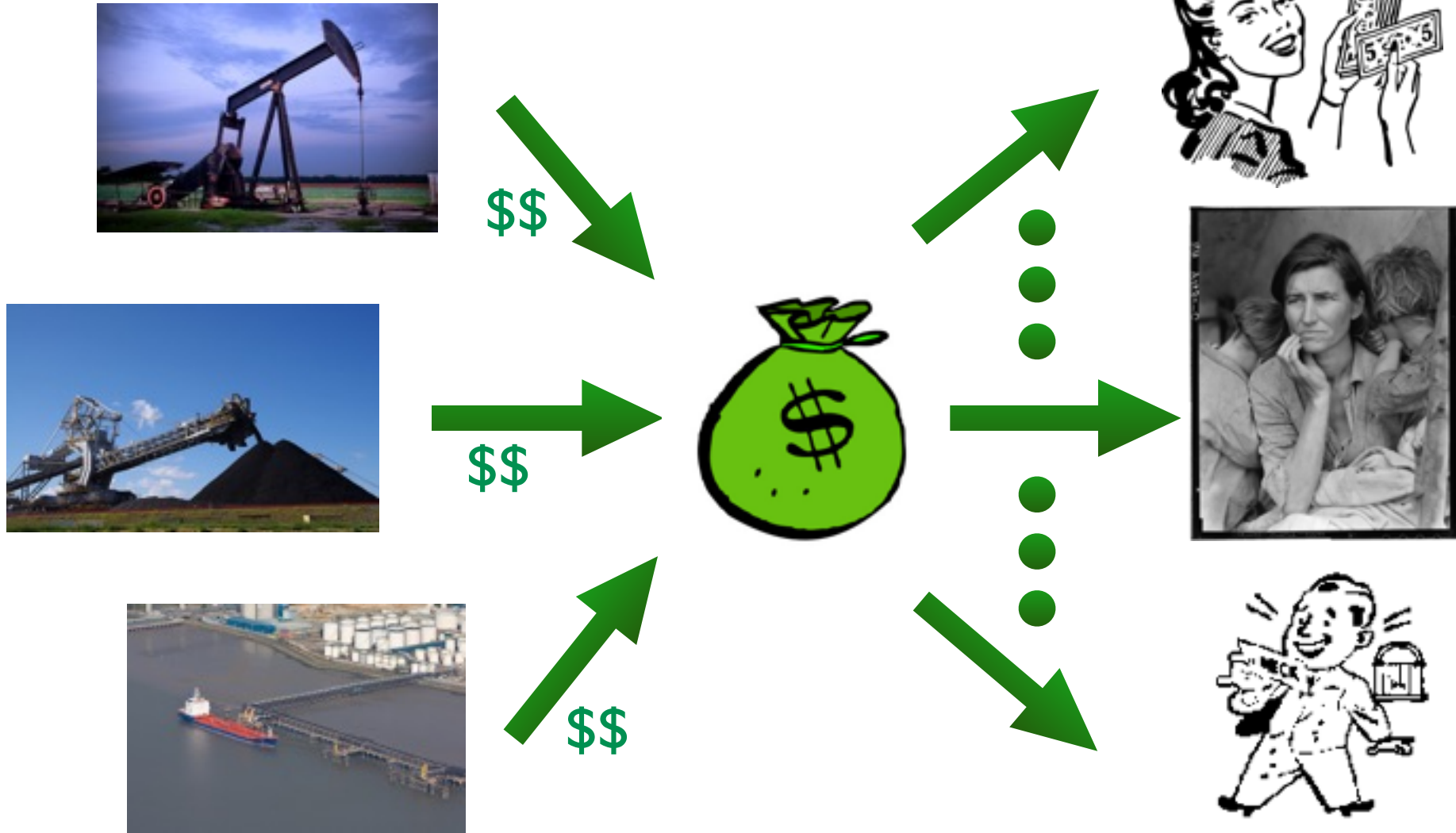


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Fee based on CO₂ content

How Fee and Dividend Works



Fee based on CO₂ content

Every legal resident gets same amount

Border Duty on Products Coming from Countries Without a Fee on CO₂



Border Duty on Products Coming from Countries Without a Fee on CO₂



Fee and Dividend Effects

- Fossil fuel more expensive so we use less and find alternatives

Fee and Dividend Effects

- Most people make more money on the dividend than they pay in higher prices!

Fee and Dividend Effects

- Investment and innovation in clean energy expands dramatically

Fee and Dividend Results

- 52% less CO₂ emissions
- Creates 2.8 million jobs
- Grows GDP by \$1.4 trillion
- Save 227,000 lives in U.S.

A Coming Tipping Point

We will go from
impossible to inevitable
without stopping at *probable*

But we need to make it happen soon

Find Your Personal Tipping Point

