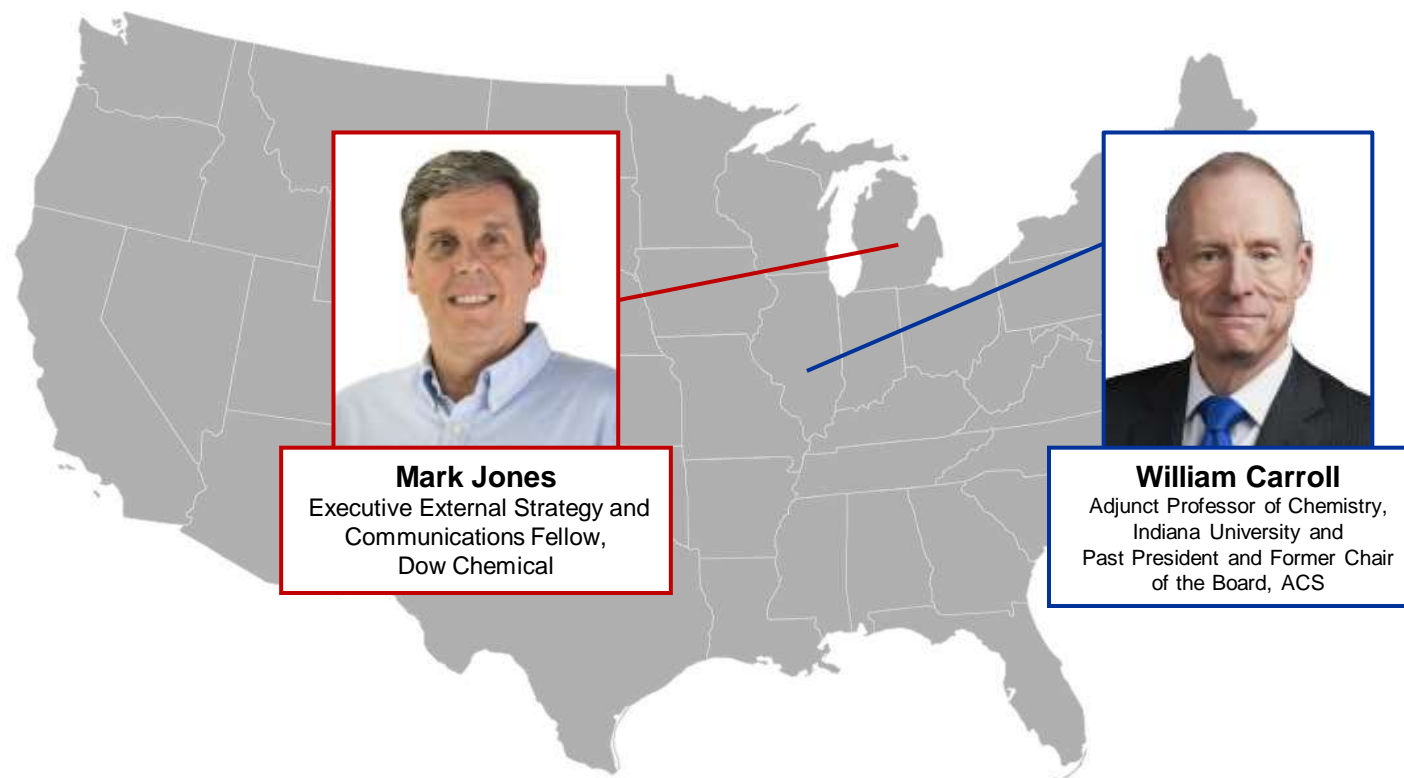


*“The Good, The Bad and the Uncertain: Public Perception of the Chemical Enterprise”* Session 3 of the 2017 Industry Science Series



**Mark Jones**  
Executive External Strategy and  
Communications Fellow,  
Dow Chemical

**William Carroll**  
Adjunct Professor of Chemistry,  
Indiana University and  
Past President and Former Chair  
of the Board, ACS

***Slides available now! Recordings are an exclusive ACS member benefit.***

**[www.acs.org/acswwebinars](http://www.acs.org/acswwebinars)**



# The Good, The Bad, and the Uncertain:

*Public Perception of the Chemical Enterprise*

Mark Jones

*Executive External Strategy and Communications Fellow*  
The Dow Chemical Company

**13 April 2017**





RFEP  
&





Hoechst Celanese



BASF



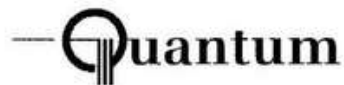
Mobil



GRACE



Ciba-Geigy



degussa



UNOCAL



Great Lakes CHEMICAL CORPORATION



Practical Help for Business





**BASF**



**Mobil**



**GRACE**



**ARCO**



**AlliedSignal**



**RHÔNE-POULENC**



**Biba-Geigy**

**Quantum**

**Goodrich**



**LYONDELL**



**National Starch**



**Ethyl**



**Lubrizol**

**HUNTSMAN**



**Olin**

**UNOCAL**

**NALCO**



**Great Lakes**



**Morton**



Remaining



Gone



EXXON

UNION  
CARBIDE

Monsanto

Hoechst Celanese



Mobil



ARCO

ROHM  
AND  
HAAS

AlliedSignal

AIR  
PRODUCTS



RHÔNE-POULENC

CYANAMID



Giba-Geigy

Quantum

BFGoodrich



LYONDELL



DOW CORNING

National Starch

FMC

Ethyl ATO  
CORPORATION

ALCOA

degussa. Lubrizol



UNOCAL



NALCO

IMC

Great Lakes  
CHEMICAL CORPORATION

IMCERA  
Practical Help for Business

Morton





MORE THAN  
**96%**  
OF ALL  
MANUFACTURED  
GOODS ARE  
DIRECTLY TOUCHED BY  
THE BUSINESS  
OF CHEMISTRY



THE BUSINESS  
OF CHEMISTRY IS AN  
**\$800**  
BILLION ENTERPRISE

CHEMICAL COMPANIES INVESTED  
**\$93 BILLION**  
IN RESEARCH AND  
DEVELOPMENT IN 2015



JUNE 2016







**THE BUSINESS  
OF CHEMISTRY  
SUPPORTS NEARLY**

**26%**

**OF THE U.S. GDP**

**THE BUSINESS OF  
CHEMISTRY ACCOUNTS FOR  
14% OF U.S. EXPORTS**  
\$184 BILLION IN 2015, AND IS THE  
LARGEST EXPORTER IN THE U.S



**A LEADER IN  
PRODUCTION, THE  
U.S. CHEMICAL INDUSTRY  
PROVIDES OVER**

**15%**

**OF THE WORLD'S  
CHEMICALS**



JUNE 2016





FOR EVERY JOB CREATED BY THE  
BUSINESS OF CHEMISTRY, 6.3 ARE  
GENERATED ELSEWHERE IN THE  
ECONOMY, TOTALING NEARLY  
**6 MILLION JOBS**

THE BUSINESS OF  
CHEMISTRY PROVIDES  
**810,000**  
SKILLED, GOOD-PAYING  
AMERICAN JOBS



THE AVERAGE ANNUAL  
PAY IN THE BUSINESS  
OF CHEMISTRY IS

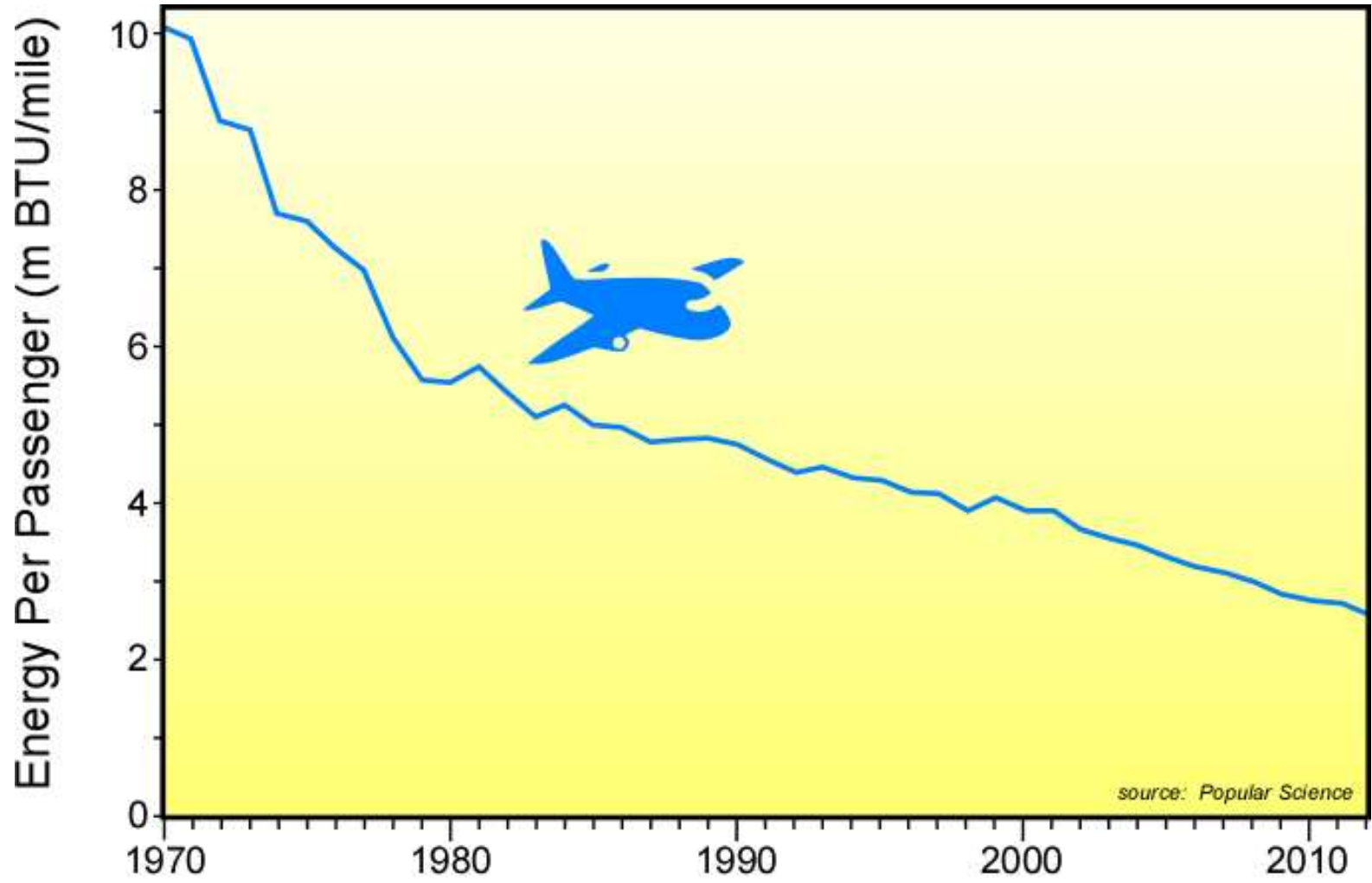
**\$94,000**

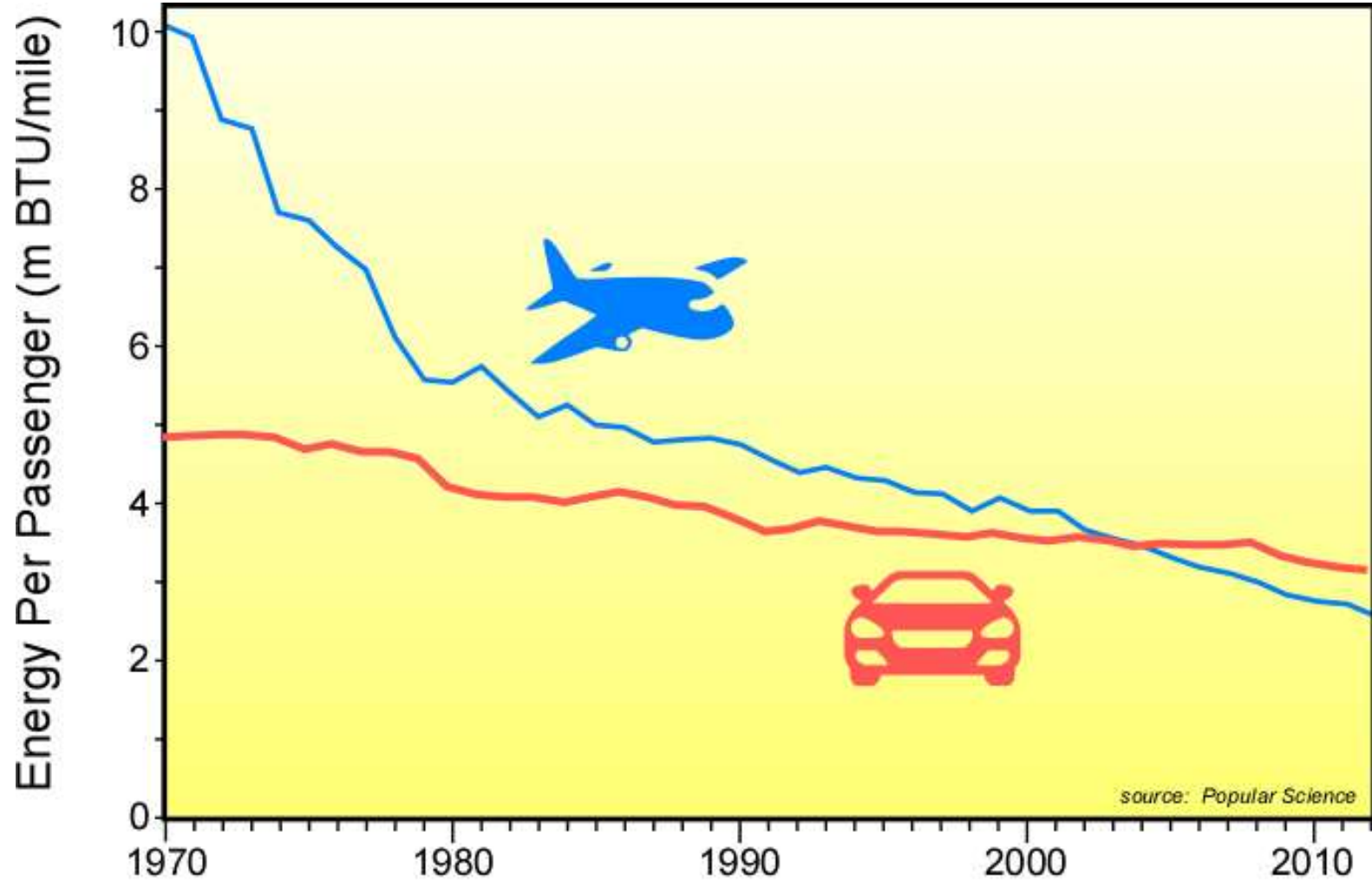
THAT'S 47% HIGHER  
THAN THE AVERAGE  
MANUFACTURING PAY

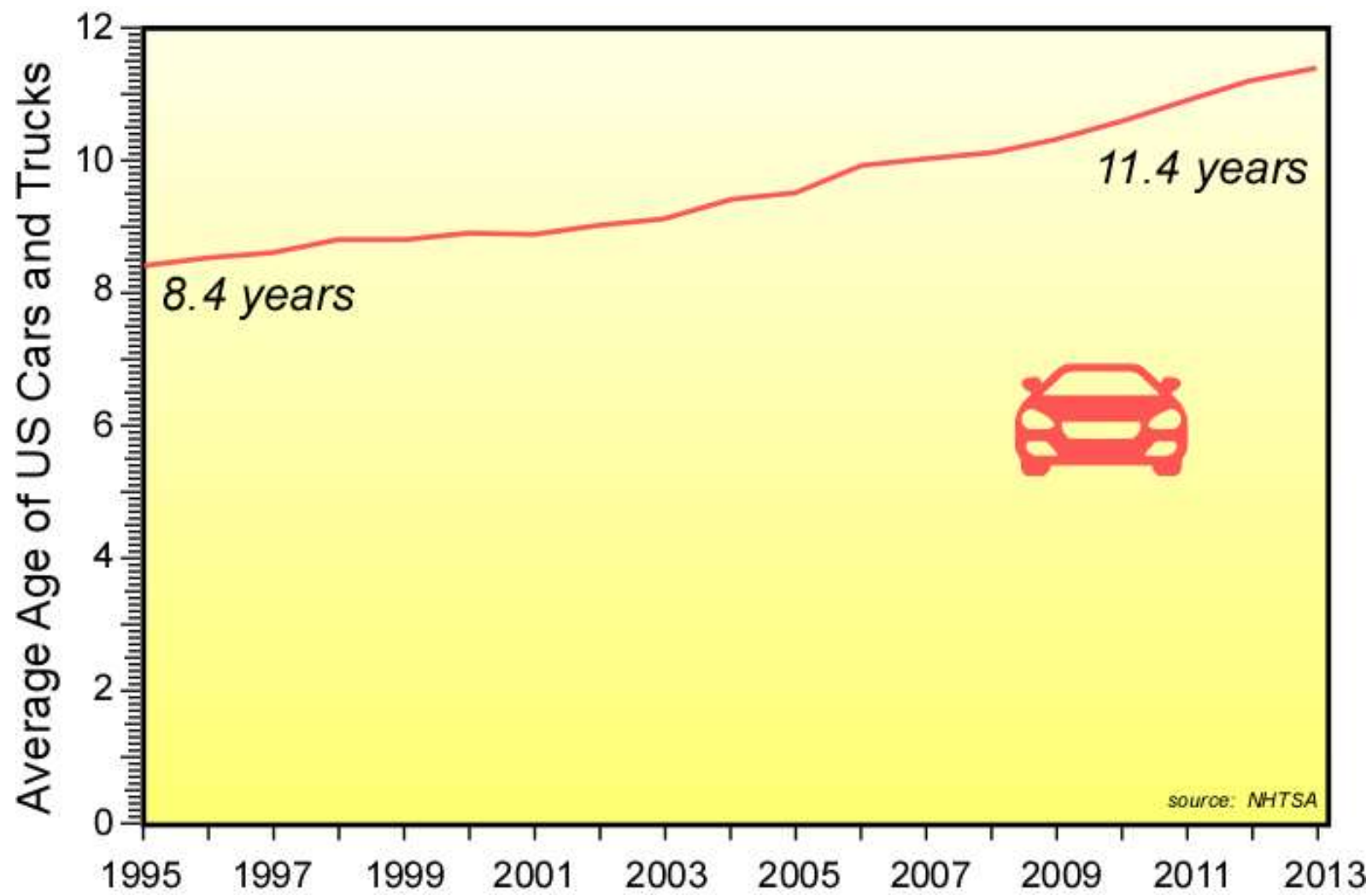


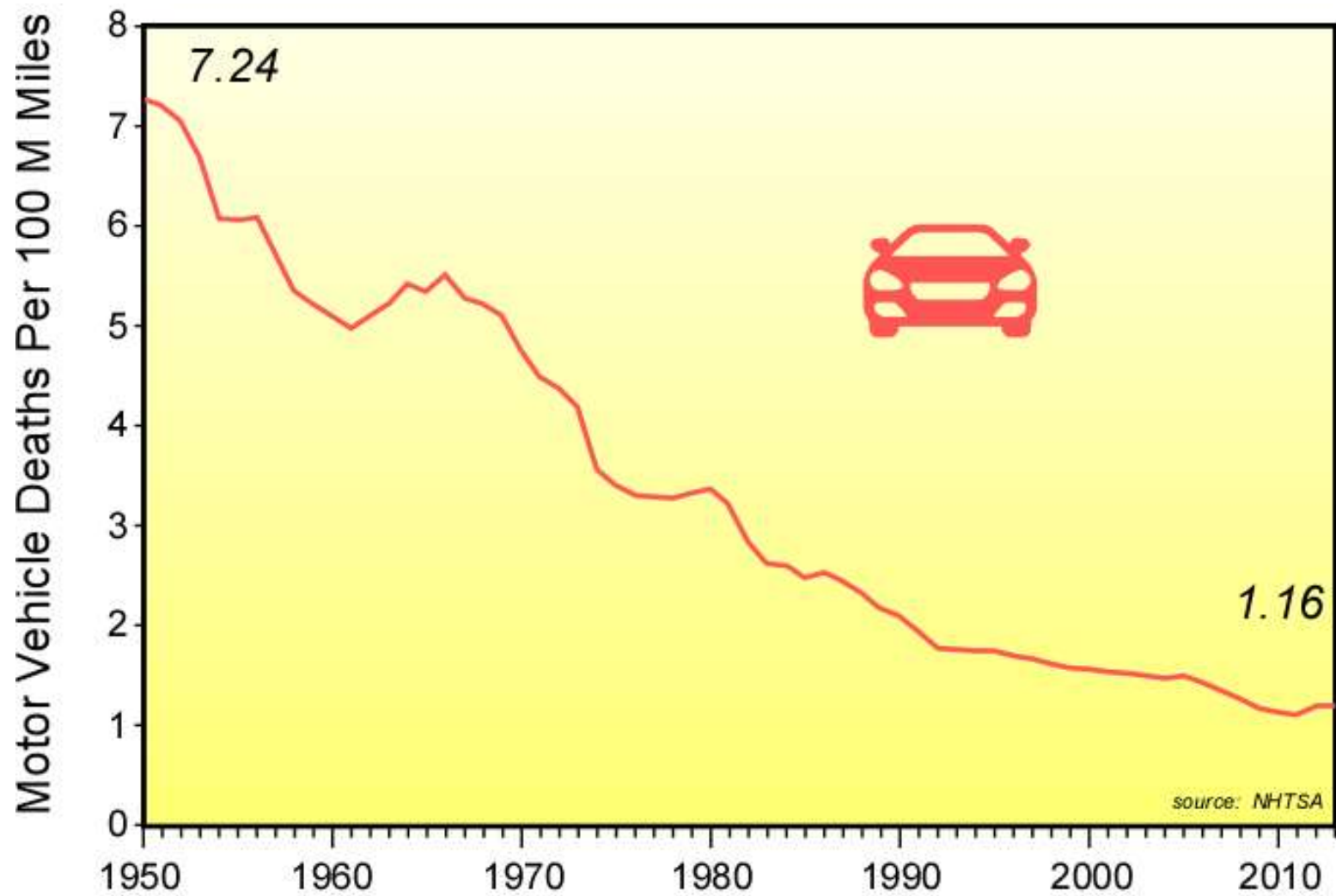
JUNE 2016

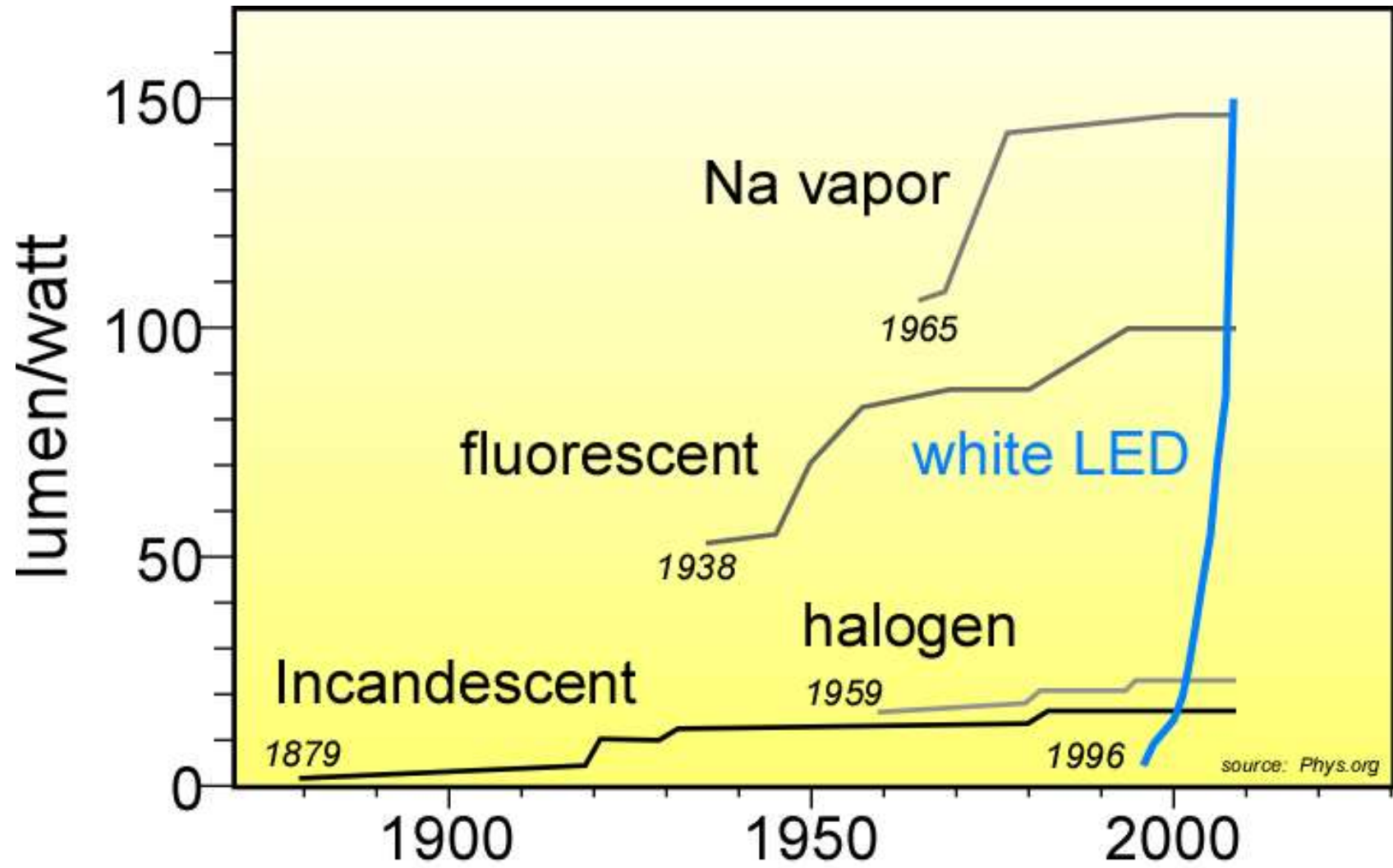


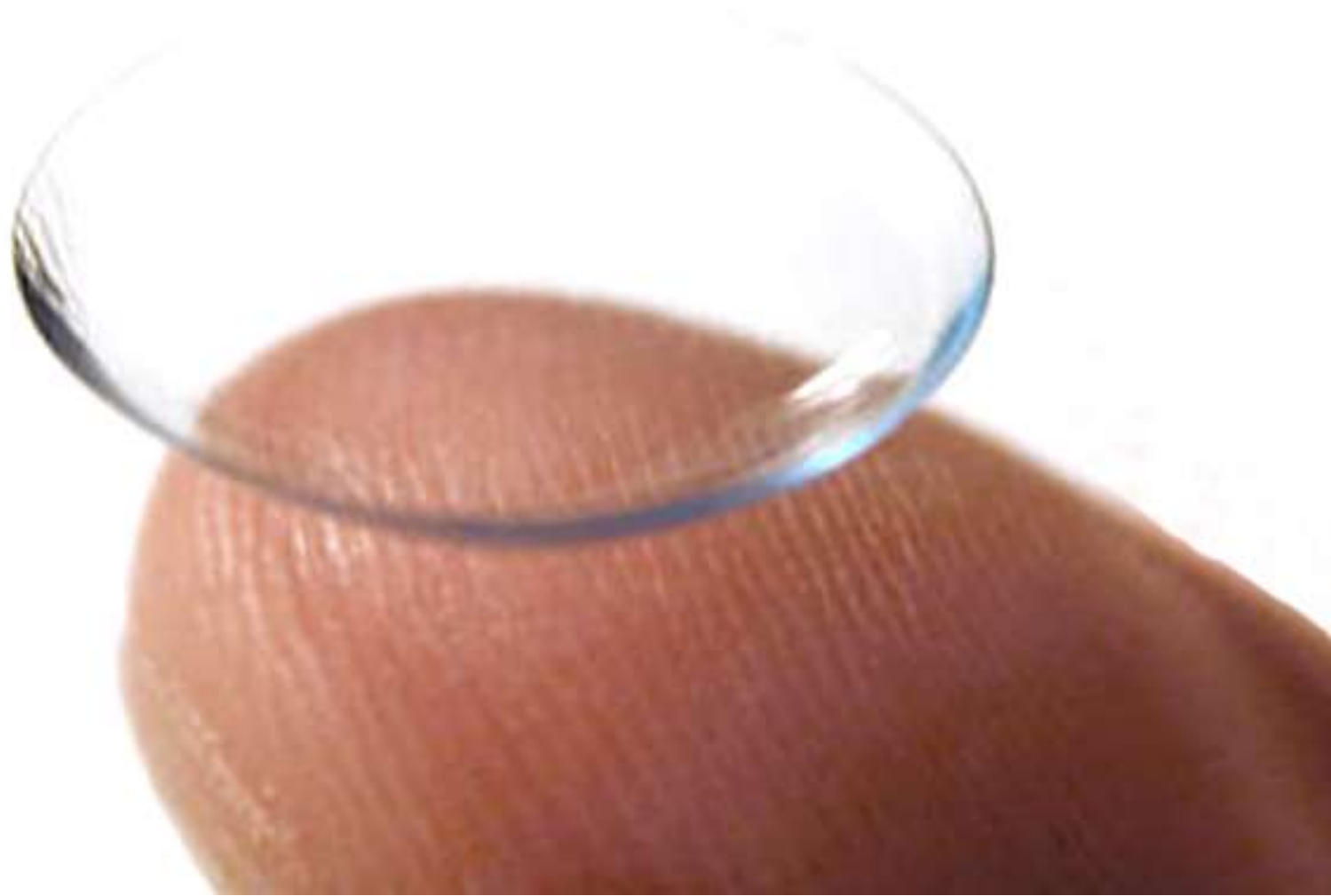








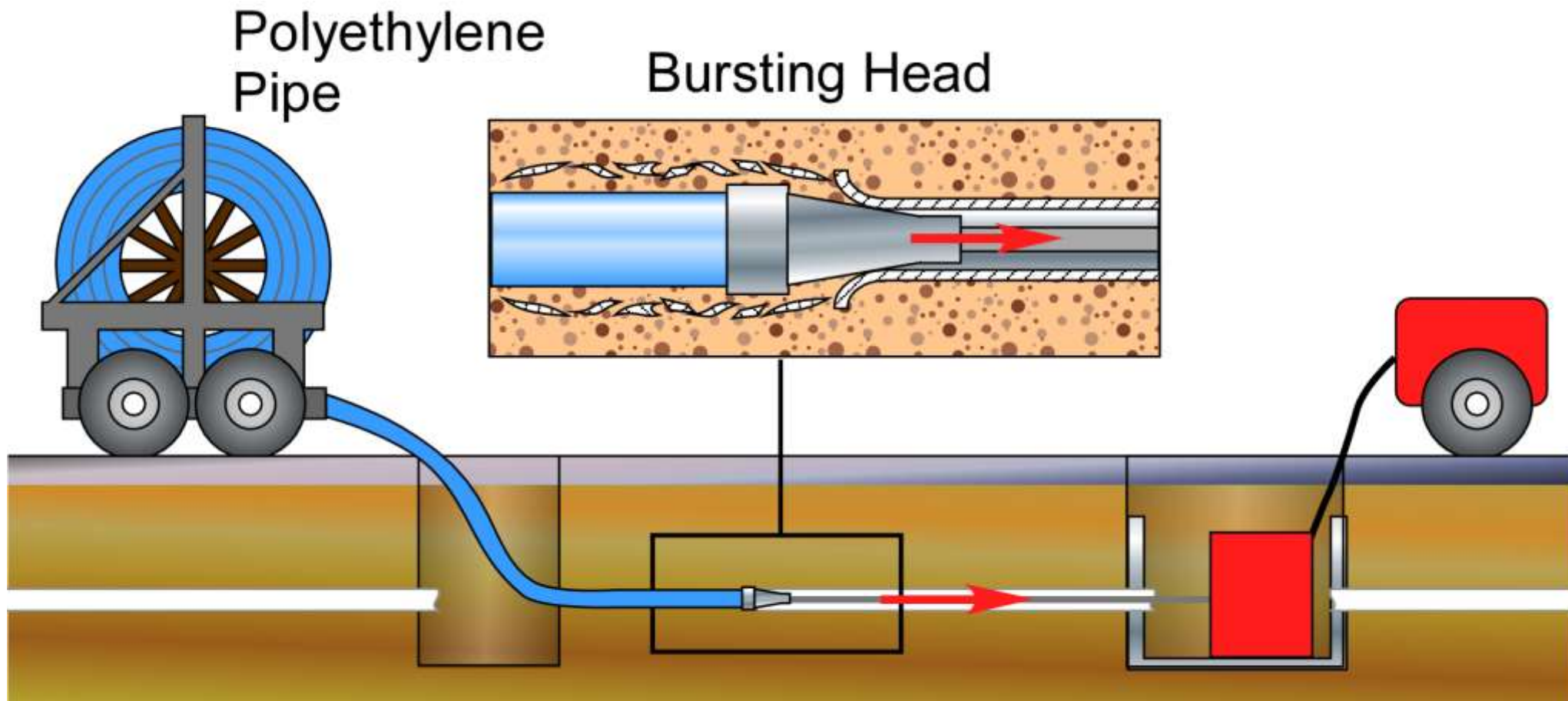


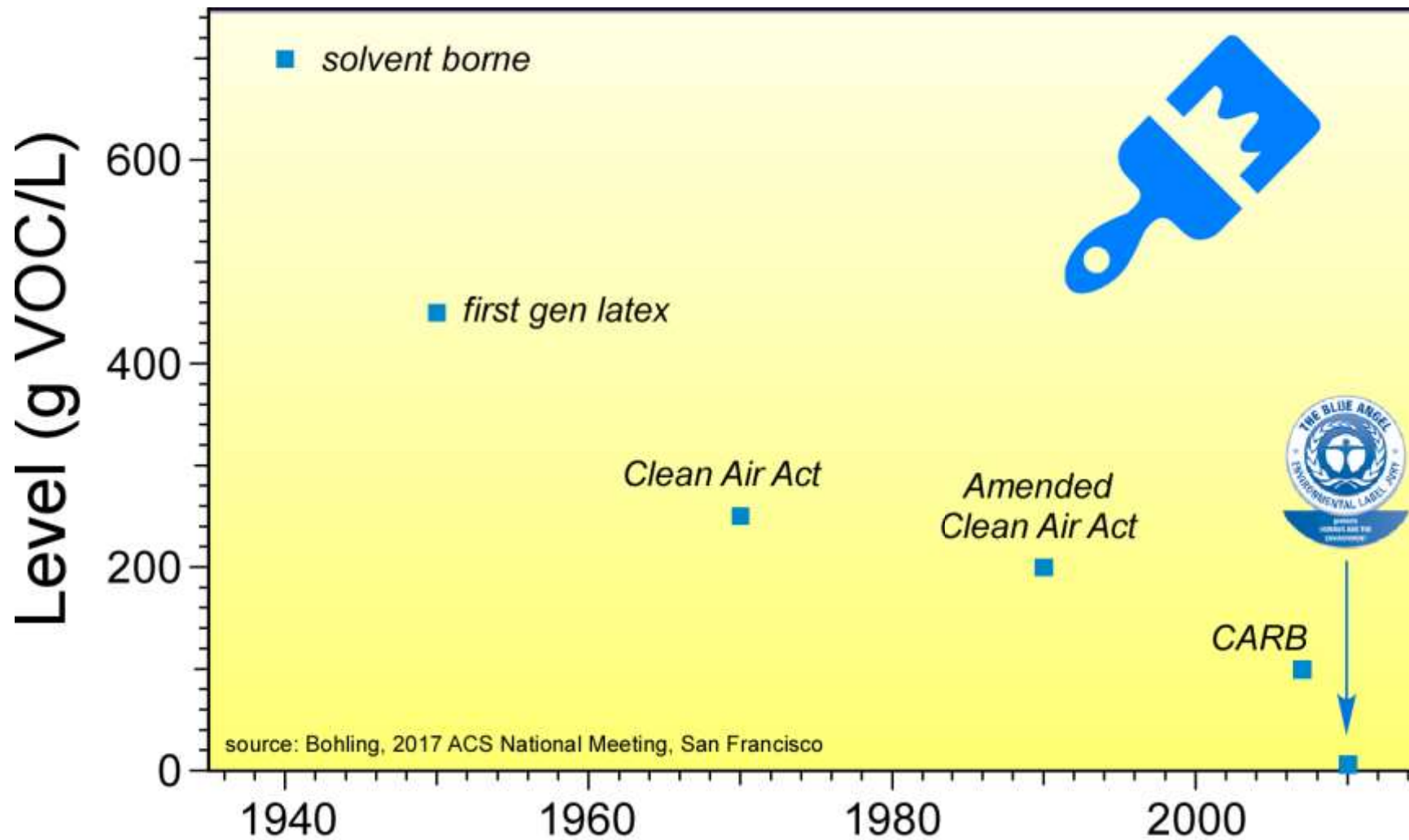


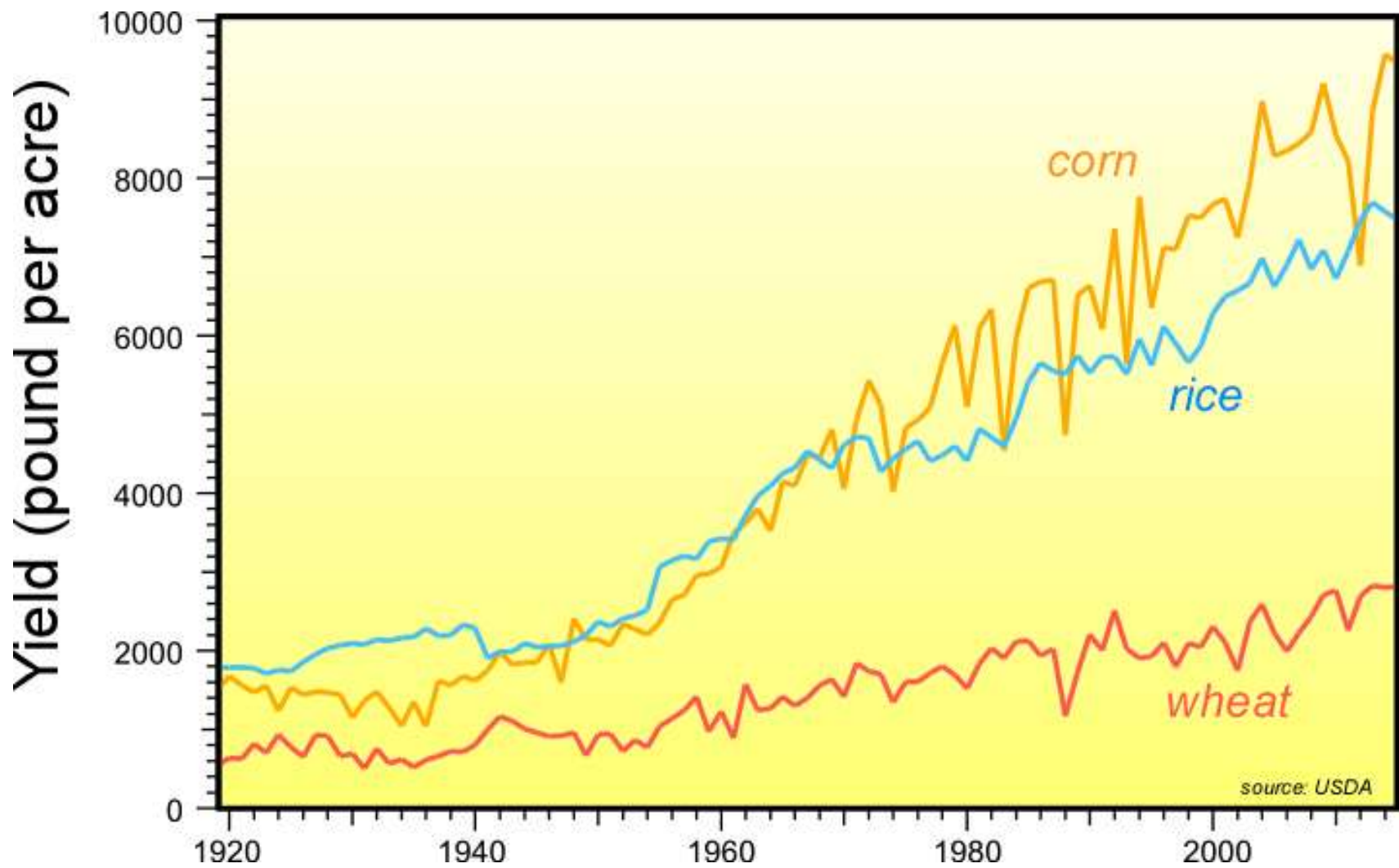




# Pipe Bursting



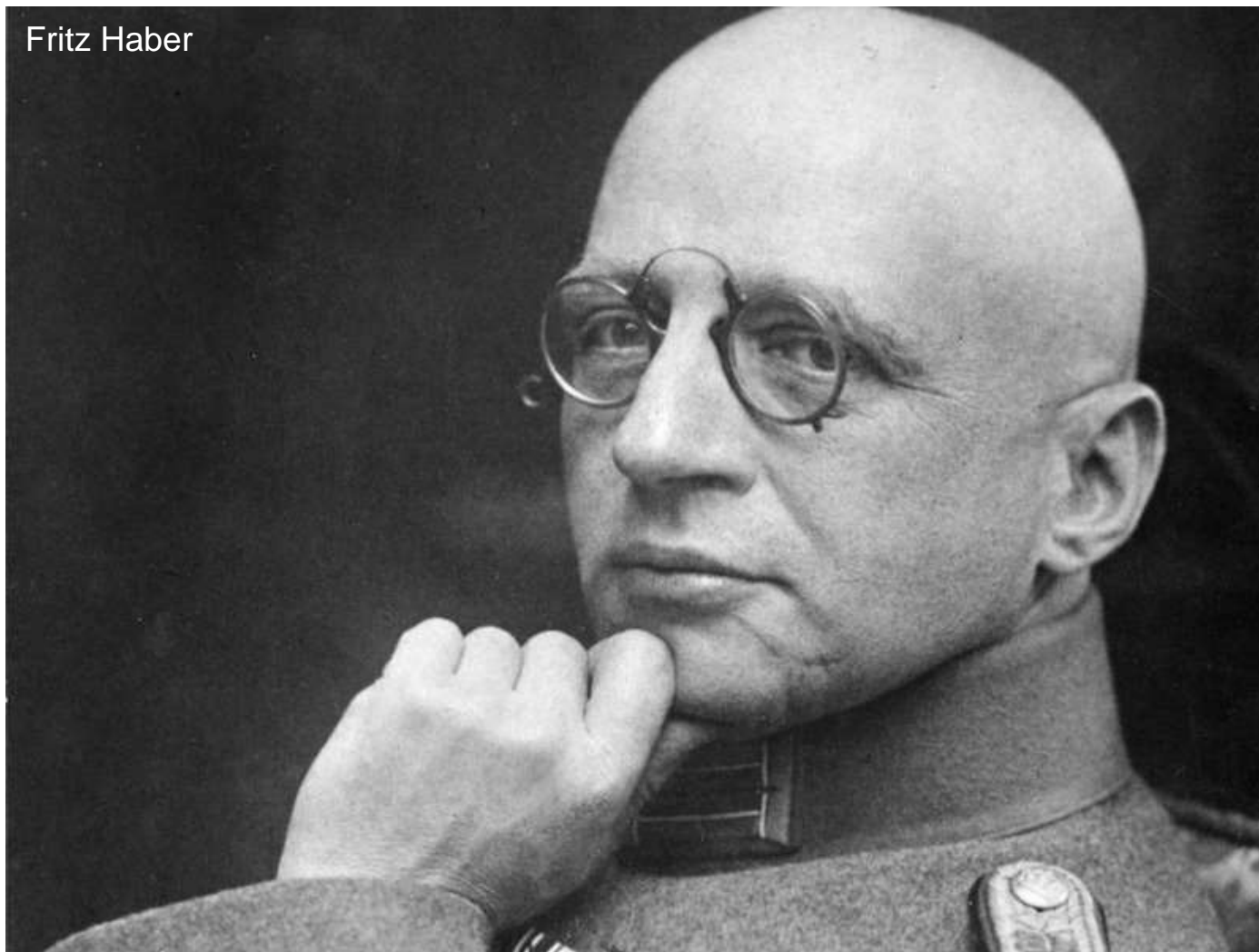






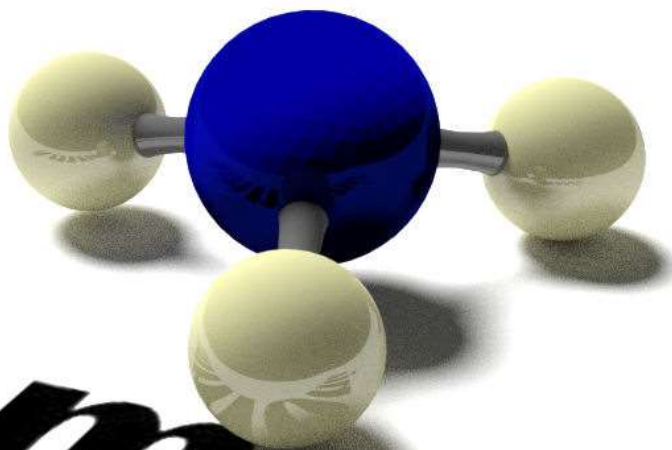


Fritz Haber





**$NH_3$**



**Ammonia**







# Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



**How much of the nitrogen in the protein of the average human is synthetically produced?**

- About one tenth

- About half

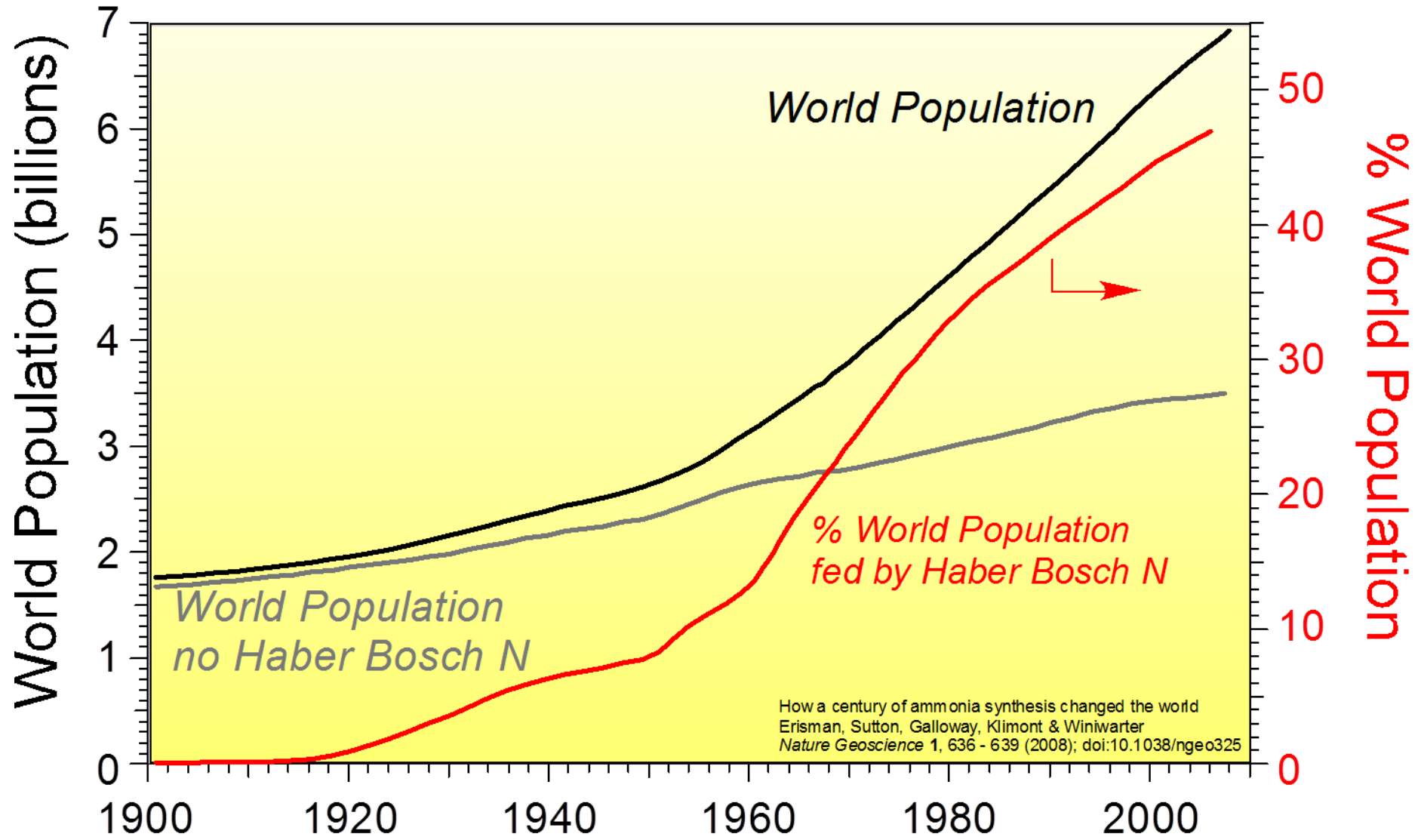
Smil, V., 1997. Global population and the nitrogen cycle. Scientific American, 277(1), pp.76-81.

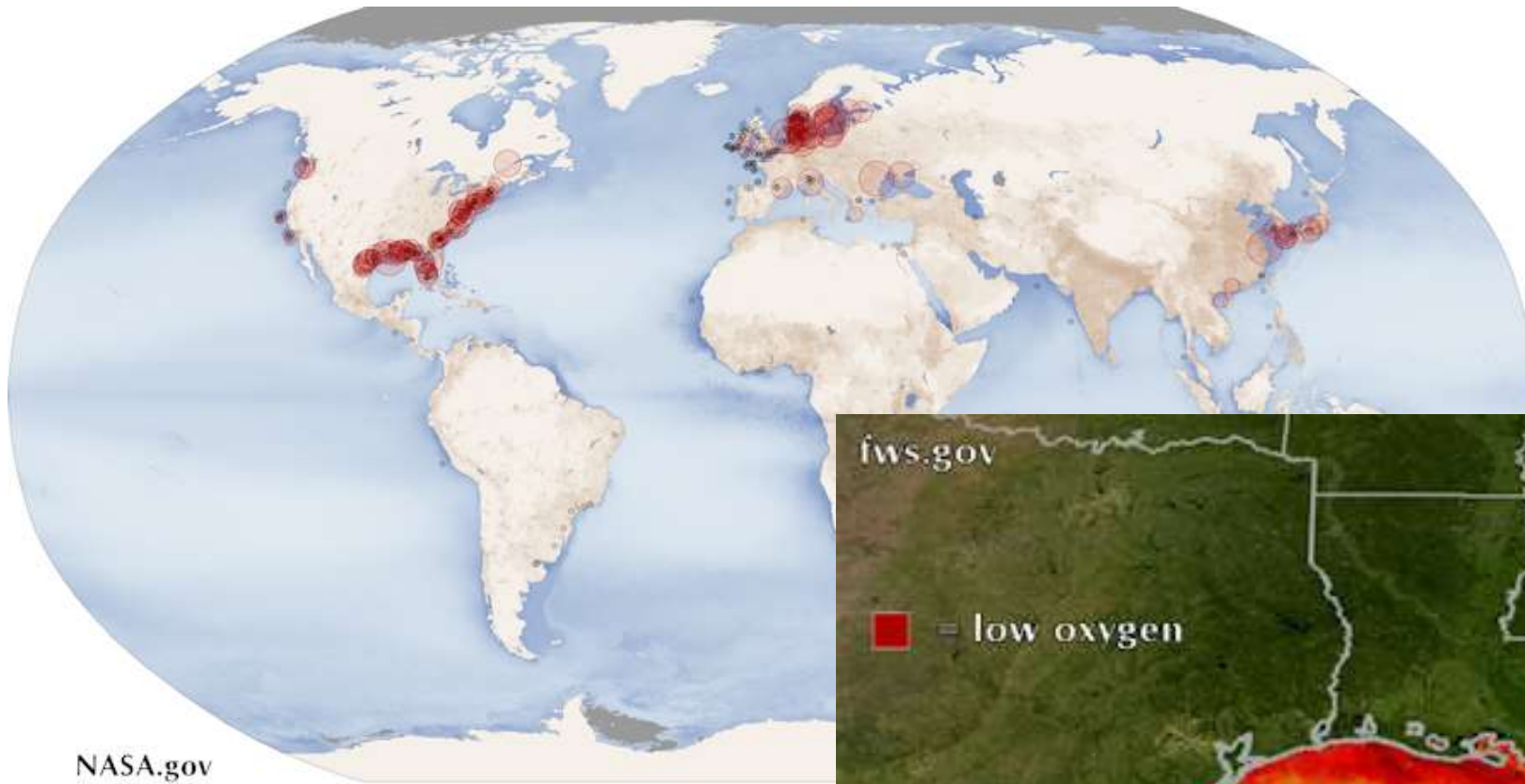
Smil, V., 2002. Nitrogen and food production: proteins for human diets. AMBIO: A Journal of the Human Environment, 31(2), pp.126-131.

- About four-fifths

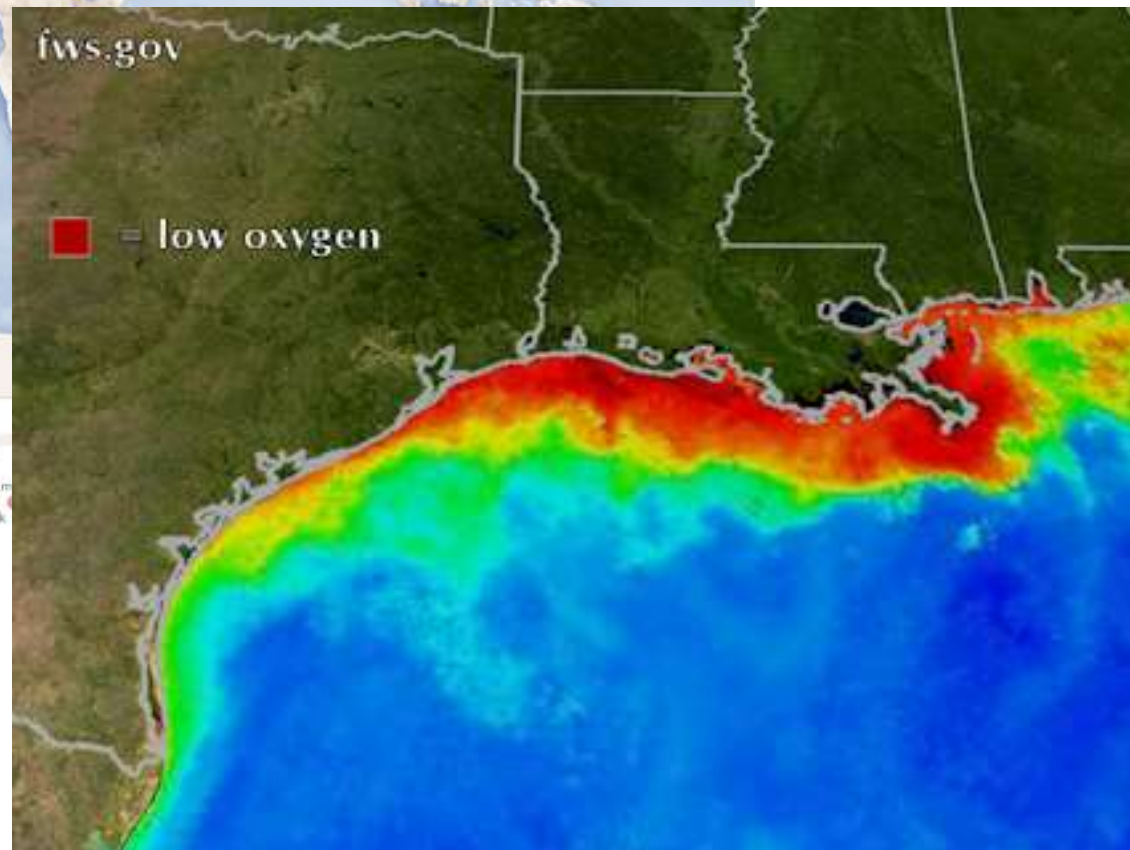
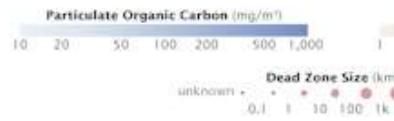
Howarth, R.W., 2008. Coastal nitrogen pollution: a review of sources and trends globally and regionally. Harmful Algae, 8(1), pp.14-20.

- Virtually all of it



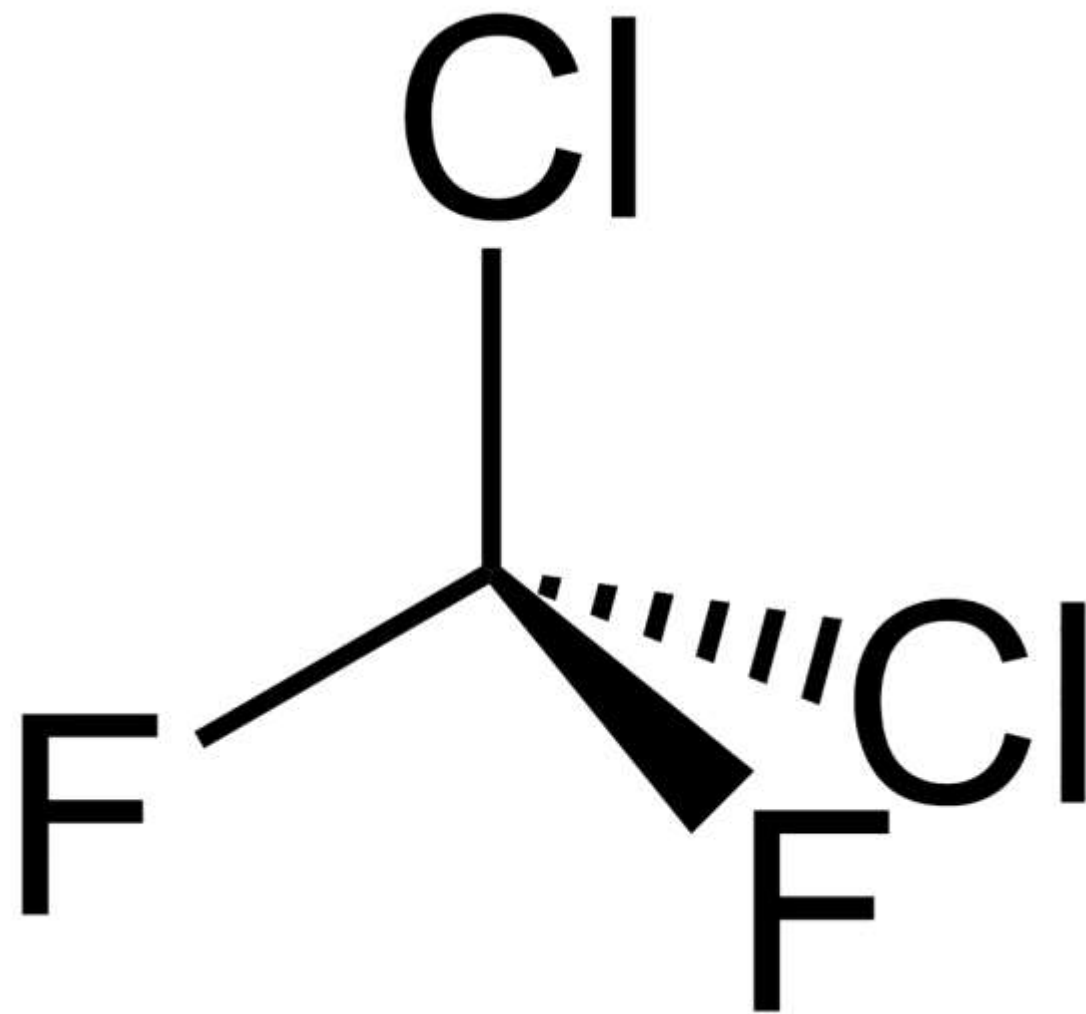


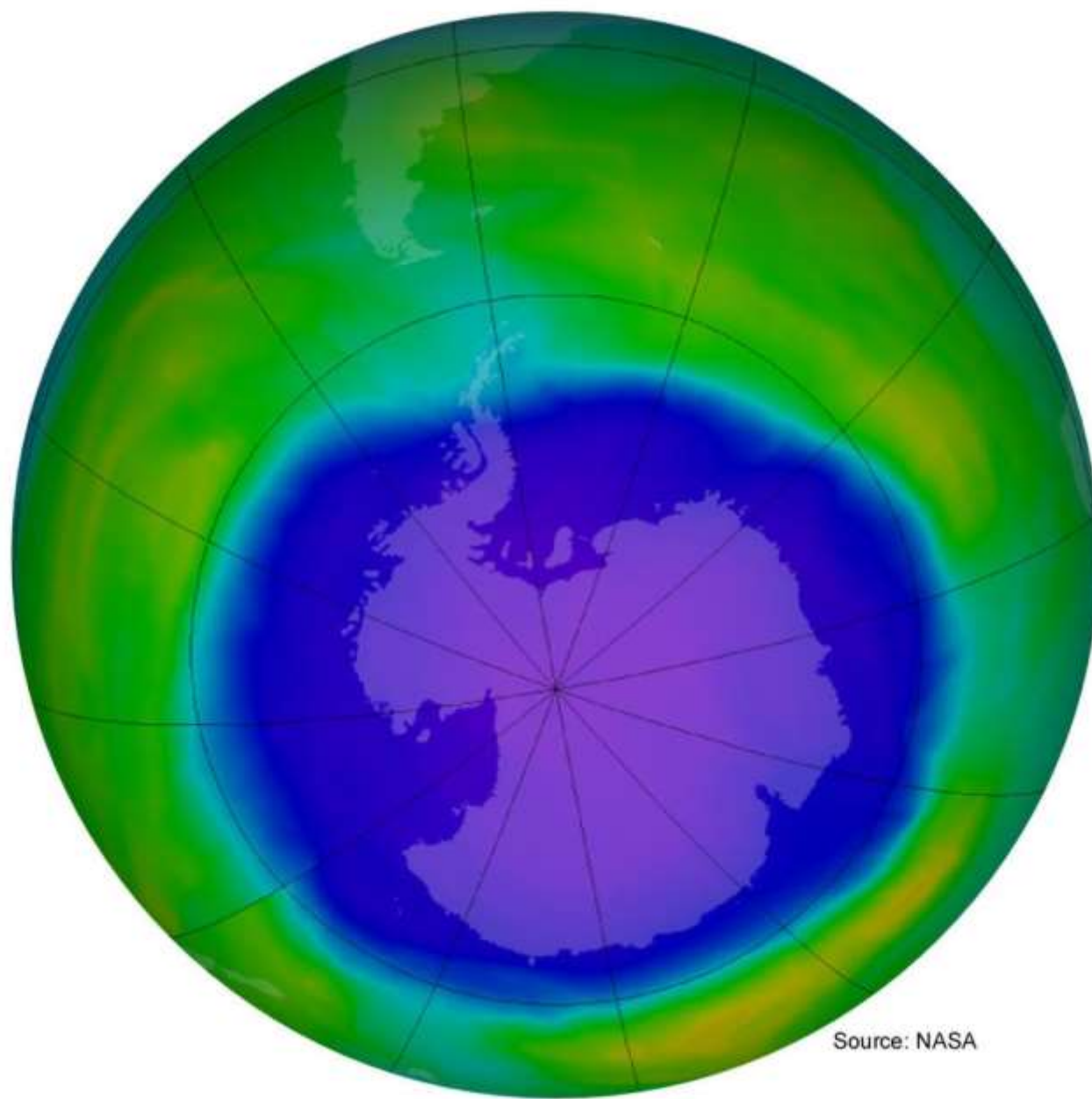
NASA.gov





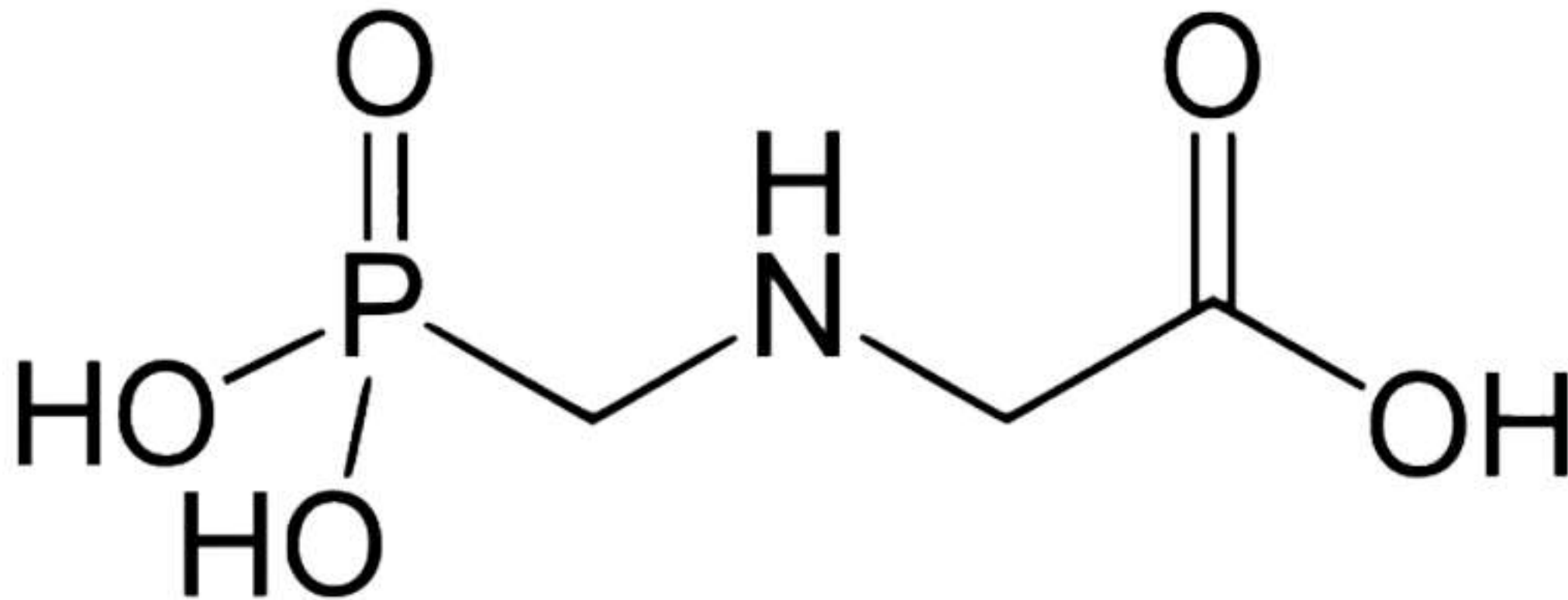






Source: NASA











**Carcinogenic  
to humans**



**Not classifiable  
as to  
carcinogenicity  
in humans**



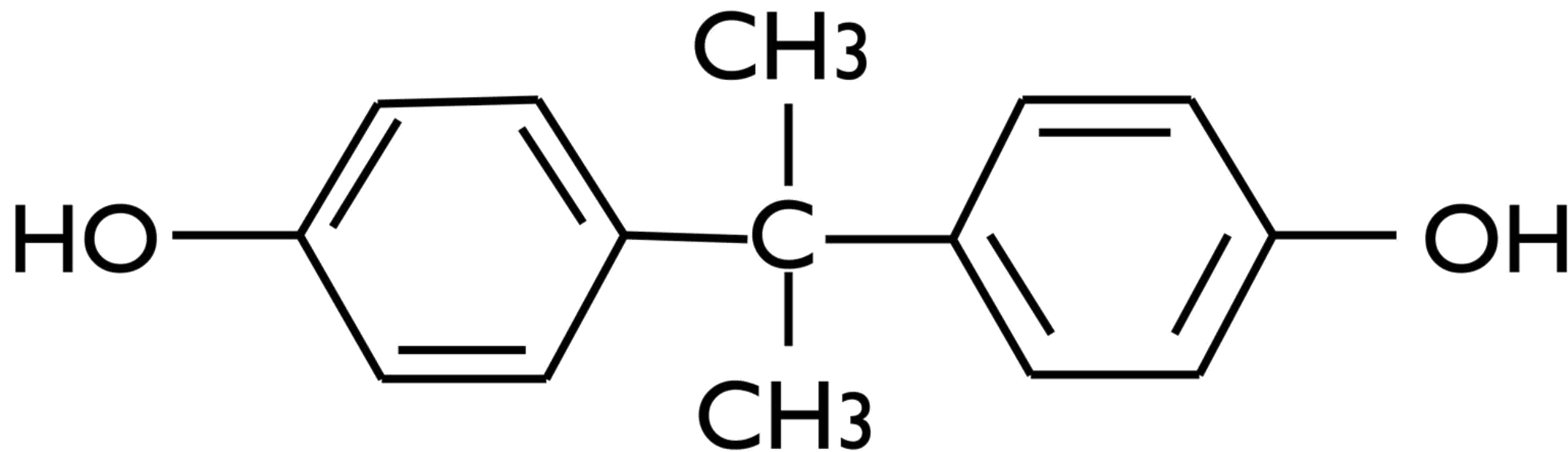
**Probably not  
carcinogenic to  
humans**



**Probably  
carcinogenic  
to humans**



**Possibly  
carcinogenic  
to humans**



# Audience Survey Question

ANSWER THE QUESTION ON BLUE SCREEN IN ONE MOMENT



**Which of these is NOT a use of bisphenol-A (BPA)?**

- in the production of most epoxy resins
- as a comonomer in polyethylene production
- as a monomer in the manufacture of polycarbonate
- in thermal receipt paper


# CANvera™



Dow Coating Materials  
**CANVERA™**

## A Fresh Approach: CANVERA™ Polyolefin Dispersion Technology

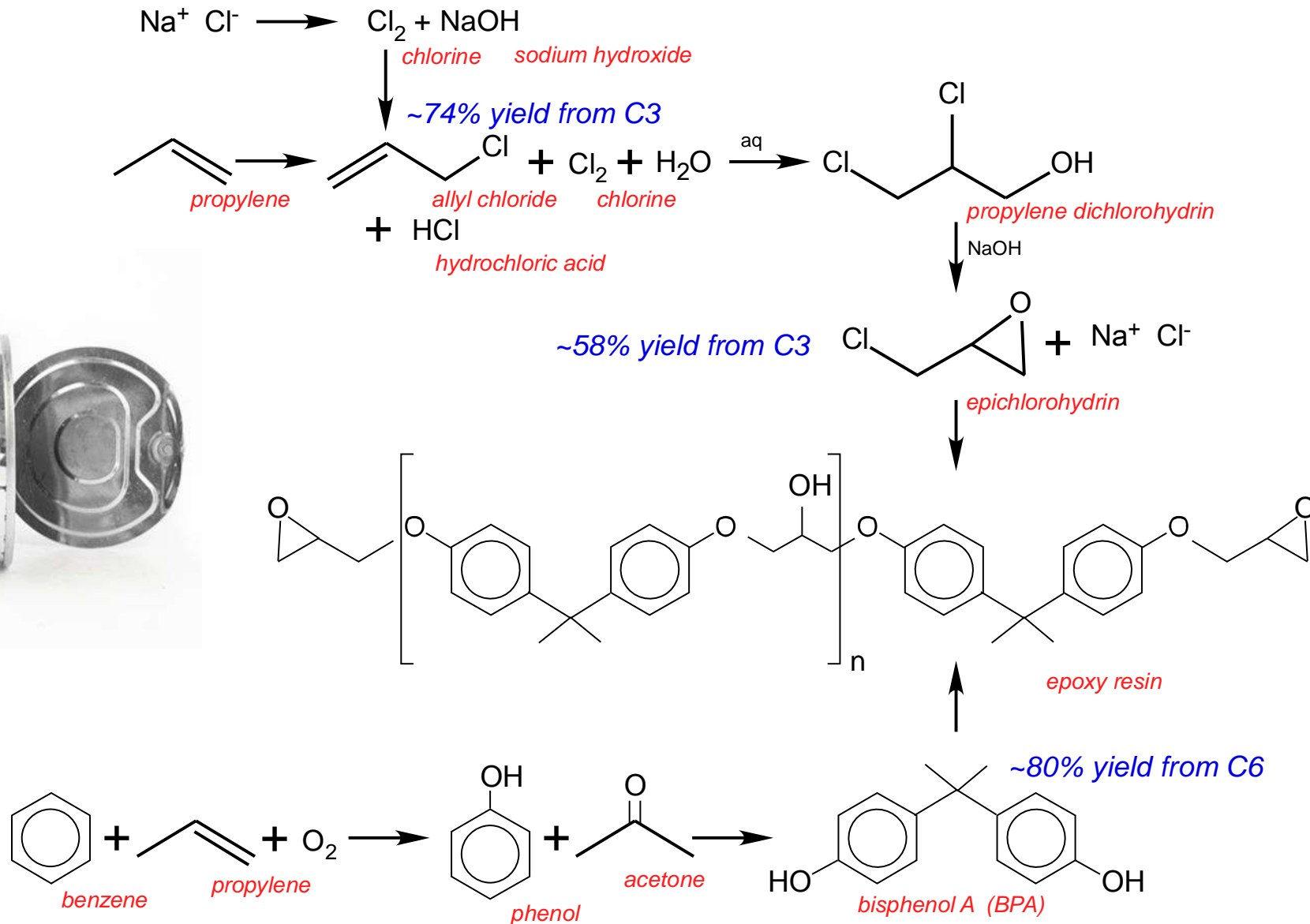
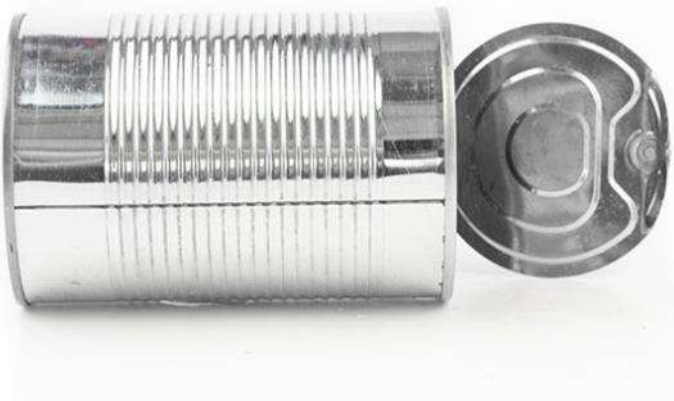
# CANvera™

a fresh approach to can coatings by 

CANVERA™ Polyolefin Dispersions offers an excellent food and flavor protection profile, excellent adhesion, corrosion protection and flexibility without impact on flavor. This innovation eliminates material traditionally found in epoxy or alternative coating systems that are of concern for many consumers.

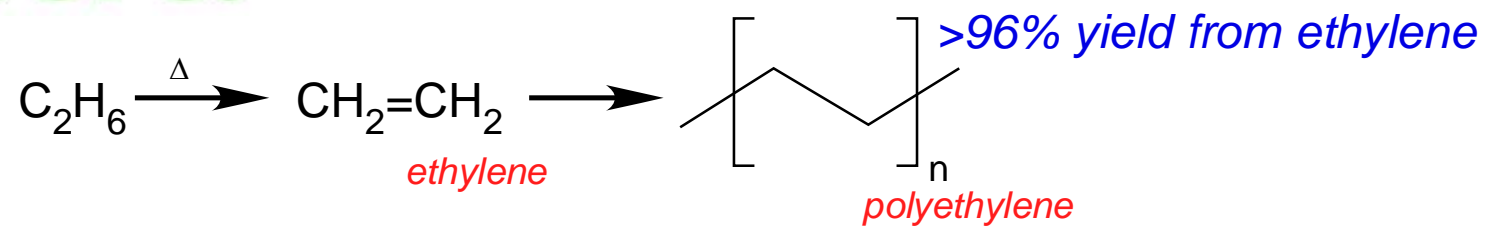


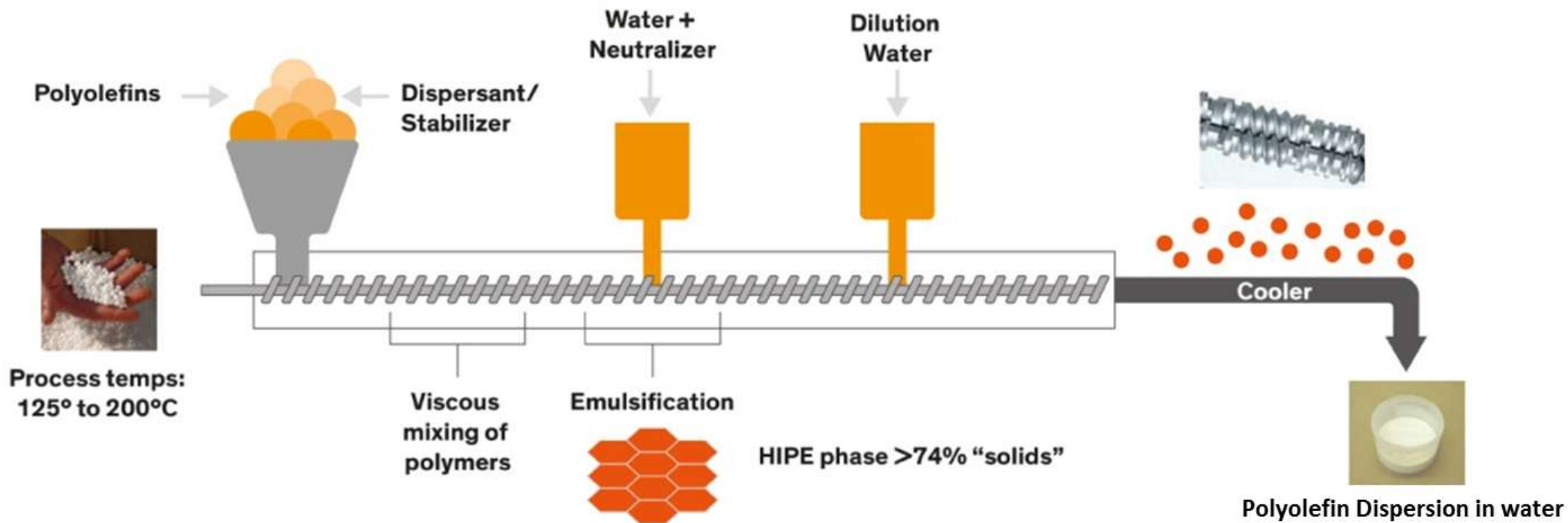
# Incumbent Epoxy Resin





# CANvera™





<http://coatings.dow.com/en/products/canvera>



# 2025 Sustainability Goals



## Leading the Blueprint

Dow leads in developing a societal blueprint that integrates public policy solutions, science and technology, and value chain innovation to facilitate the transition to a sustainable planet and society.



## Delivering Breakthrough Innovations

Dow delivers breakthrough sustainable chemistry innovations that advance the well being of humanity.



## Advancing a Circular Economy

Dow advances a Circular Economy by delivering solutions to close the resource loops in key markets.



## Valuing Nature

Dow applies a business decision process that values nature, which will deliver business value and natural capital value through projects that are good for the company and good for ecosystems.



## Increasing Confidence in Chemical Technology

Dow increases confidence in the safe use of chemical technology through transparency, dialogue, unprecedented collaboration, research, and our own actions.



## Engaging Employees for Impact

Dow people worldwide directly apply their passion and expertise to advance the well being of people and the planet.



## World-Leading Operations Performance

Dow maintains world-leading operations performance in natural resource efficiency, environment, health, and safety.

