

Filling The Void

A Conversation About Space,
Policy, and Public Narratives

Joseph Kenrick



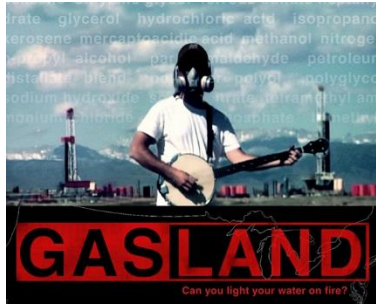
About Me



- B.S. Petroleum Engineering – Mines '17
 - Minor in Economics
- Engineer Oil and Gas Industry – '17-'21
 - California
 - Texas
 - New Mexico
 - Thailand
- M.S. Space Resources – Mines '23 (exp.)
 - Research Engineer
- Space Resources Engineer – Lunar Outpost '22

"With public sentiment, nothing can fail; without it nothing can succeed." - A. Lincoln

The Narrative – O&G



Scientific Study Links Flammable Drinking Water to Fracking

NATIONAL

Living near oil and gas wells exposes you to toxic gases. CA study shows just how much

Science

Surface Water Vulnerable to Widespread Pollution From Fracking, a New Study Finds

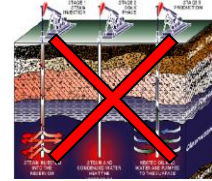


Why Does Green California Pump the Dirtiest Oil in the U.S.?

New Analysis: Gov. Newsom Urgently Needs to Stop Permitting New Oil, Gas Wells in California

Effect

- Ban on new cyclic steam wells
 - Ban on fracking
- Most stringent regulations
 - Highest tax rate
- Pressured government officials



Laws

- U.S. Clean Air Act
- U.S. Clean Water Act
- U.S. Safe Drinking Water Act
- U.S. Endangered Species Act
- National Environmental Policy Act
- U.S. Occupational Health and Safety Act
- California Clean Air Act
- California Global Warming Solutions Act
- California Water Code

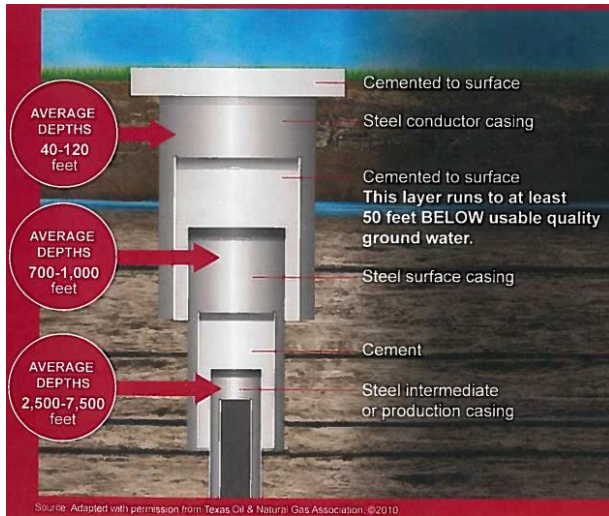
Agencies

- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- U.S. Bureau of Land Management
- California Division of Oil, Gas and Geothermal Resources (DOGGR)
- California Department of Fish and Wildlife
- California State Water Resources Control Board



Hydraulic Fracturing

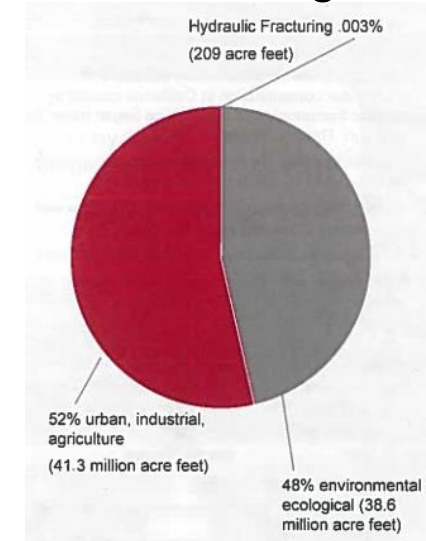
O&G Well



Frack Fluid



Water Usage



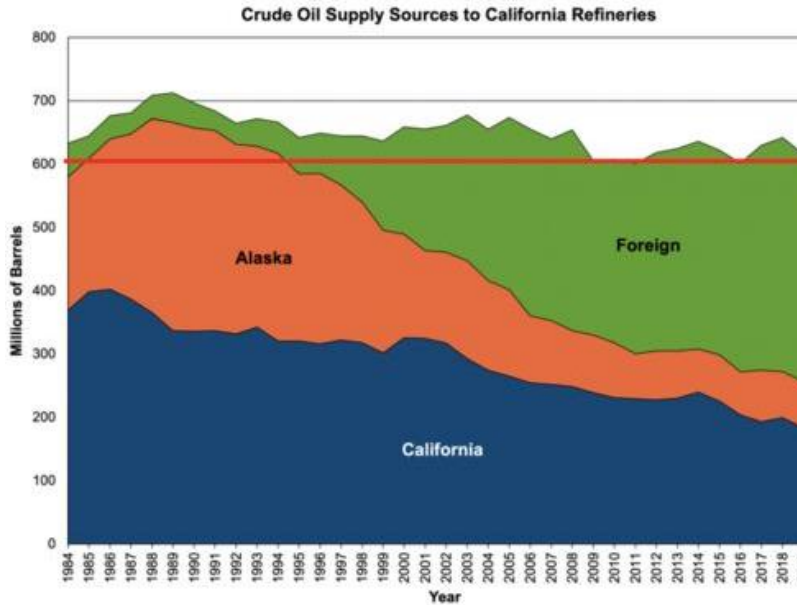
**Opposition Narrative: HF
contaminates ground water**

**Opposition Narrative: HF
fluid is hazardous/poisonous**

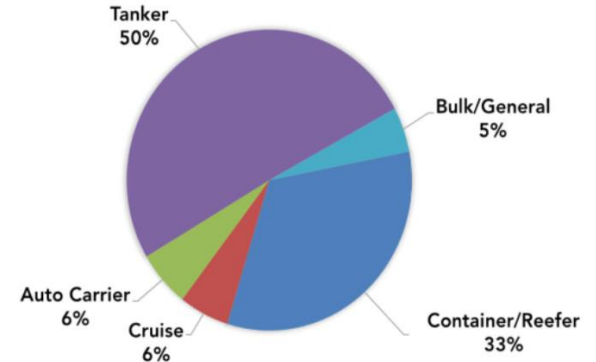
**Opposition Narrative: HF
uses absurd amount of water**

Pollution

Opposition Narrative: Pollution from in-state production of O&G is disastrous



Projected Statewide At Berth PM_{2.5} Emissions – Auxiliary Engines and Boilers (2020)



15 of the largest ships now emit as much SO_x as 760 million cars

The Narrative - Space

Billionaires should focus their money on climate change rather than space travel, says public

Why Elon Musk's SpaceX launch is utterly depressing

How bad is space tourism for the environment? And other space travel questions, answered.

Six questions to consider before launching yourself into space.

ENVIRONMENTAL JUSTICE
Space Tourism Is a Waste

NEWS & POLITICS
Where NASA Went Wrong

BUSINESS | JULY 20, 2021

One Giant Leap for Inequality Jeff Bezos's space joyride is a spectacle of grotesque wealth.



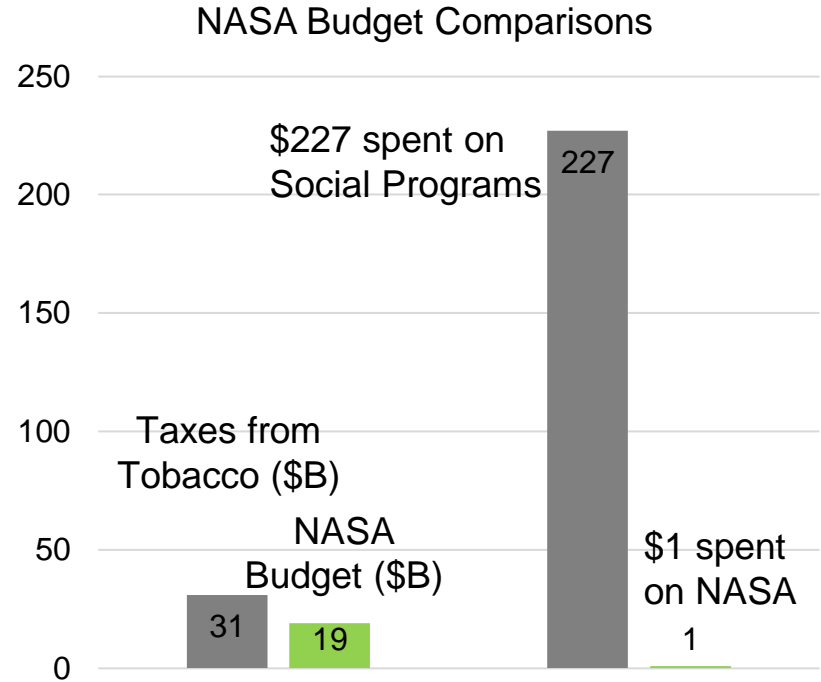
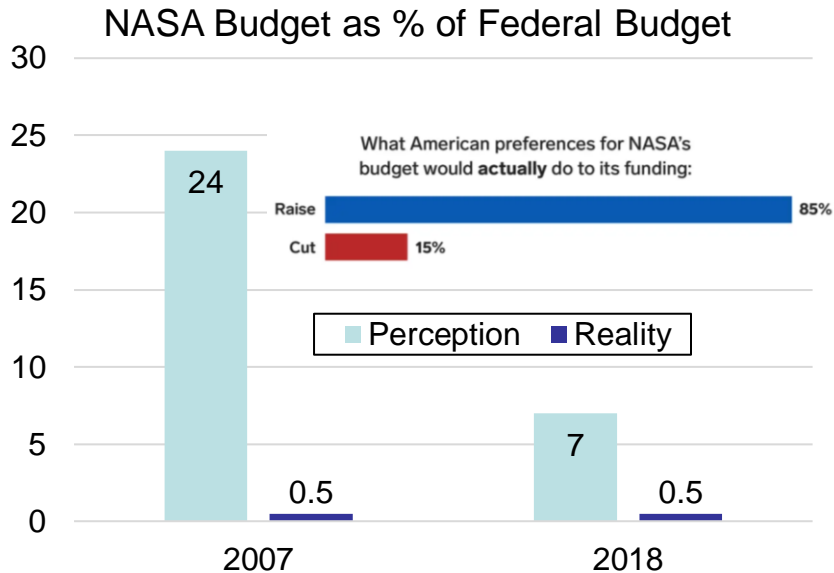
Billionaire space race: the ultimate symbol of capitalism's flawed obsession with growth

Published: July 20, 2021 9:32am EDT

Billionaire Space Race Turns Into A Publicity Disaster

NASA Budget

Opposition Narrative: We are spending too much on space



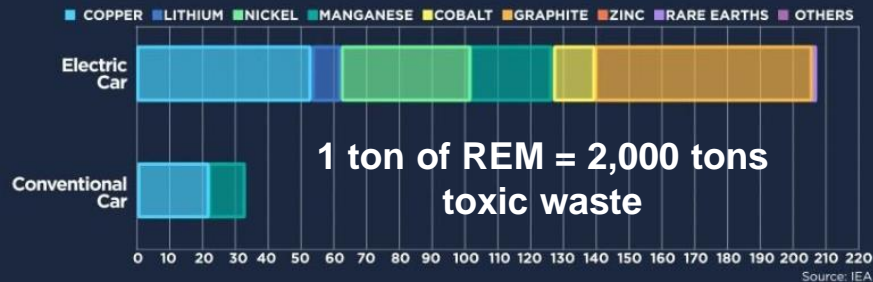
Pollution

Opposition Narrative: Space efforts are polluting unnecessarily

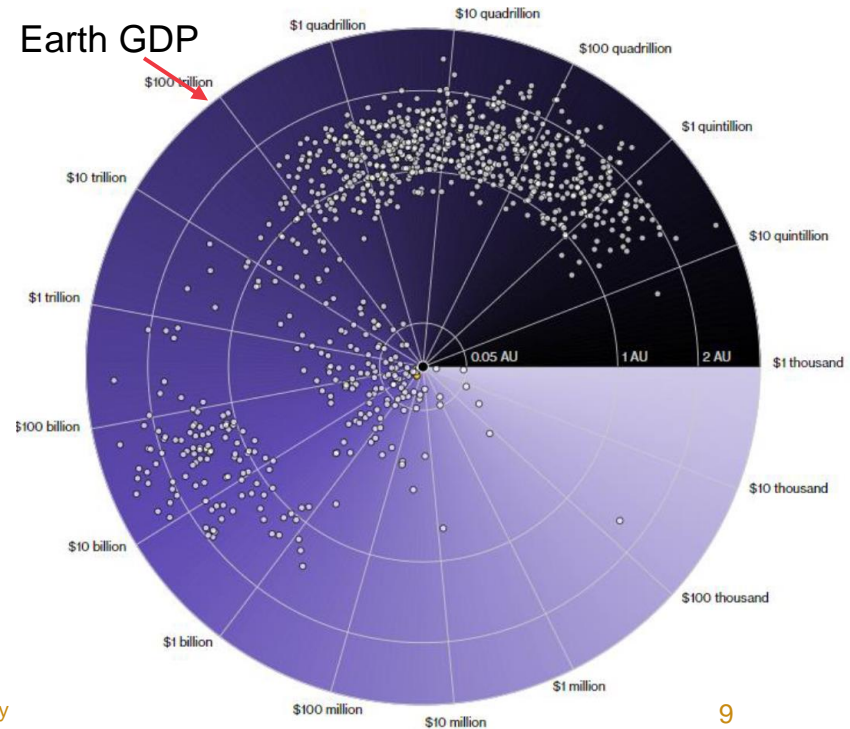
Facts

- US needs 10X more REM to hit 2030 EV goal
- 16 Psyche = 1 million years of Earth mining

MINERALS USED IN ELECTRIC CARS COMPARED TO CONVENTIONAL CARS



Value of Asteroids



Public Relation Efforts

NASA Brand Balance Sheet

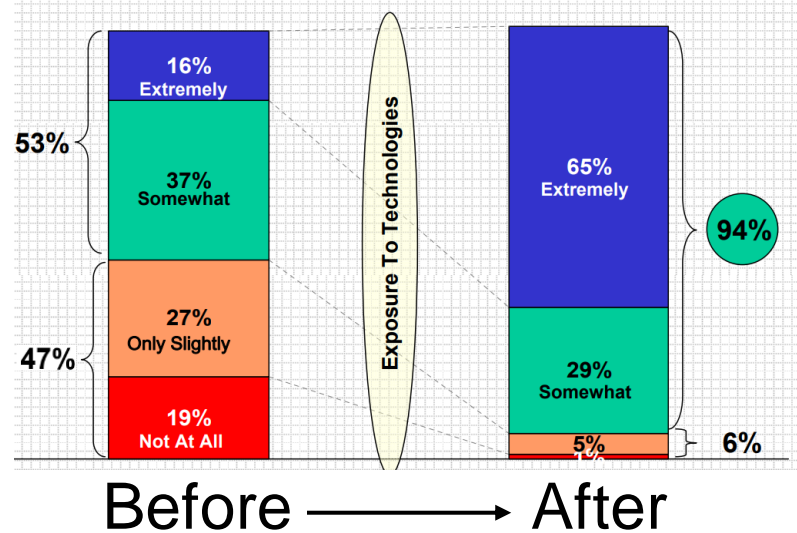
Strengths

- 1 Near Universal Awareness
- 2 Enormous Public Appreciation
- 3 High Support
- 4 Wide Appeal

Challenges

- 1 Little Specific Knowledge
- 2 Lack of Relevance
- 3 Low Excitement
- 4 Disconnect from Activities
- 5 Lack of Current Context

Is NASA relevant?



Space resources development = \$3B in spillover technology (proj.)

What's Next?

- Public relations
 - Education and tours
 - Collaborative rule making
 - Elected official & regulator outreach
 - Public outreach
 - Media relations
 - Trade organizations
 - Dedicated advocates/ambassador messaging
- Agile policy making
 - Incremental policy development based on technological progress.
 - That is, if the technology to exploit a particular space resource does not yet exist, the policy should not either.
 - Separate legal regimes for separate activities



Resources

- NASA's interactive spillover tech website:
 - <https://homeandcity.nasa.gov/>
- NASA's spinoff tech presentations:
 - <https://spinoff.nasa.gov/>



A photograph of an astronaut in a white spacesuit standing on the lunar surface. To the left is a lunar rover with gold-colored insulation. An American flag is planted in the ground between the rover and the astronaut. The background shows the dark, cratered horizon of the moon under a black sky.

THANK YOU!

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