



Dude, Where's My Solar Powered Car?

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The public conversation about how to power cars hasn't always been intelligent



“This one guy in Nevada totally built a water powered car!!!”

Solar cars work well, but they simply won't scale



= 2 hp

~27% solar efficiency



= 190 hp

would require over
2500% solar efficiency



**This is a very narrow
perspective of “solar
power”**

The truth is, unless you drive one of these...

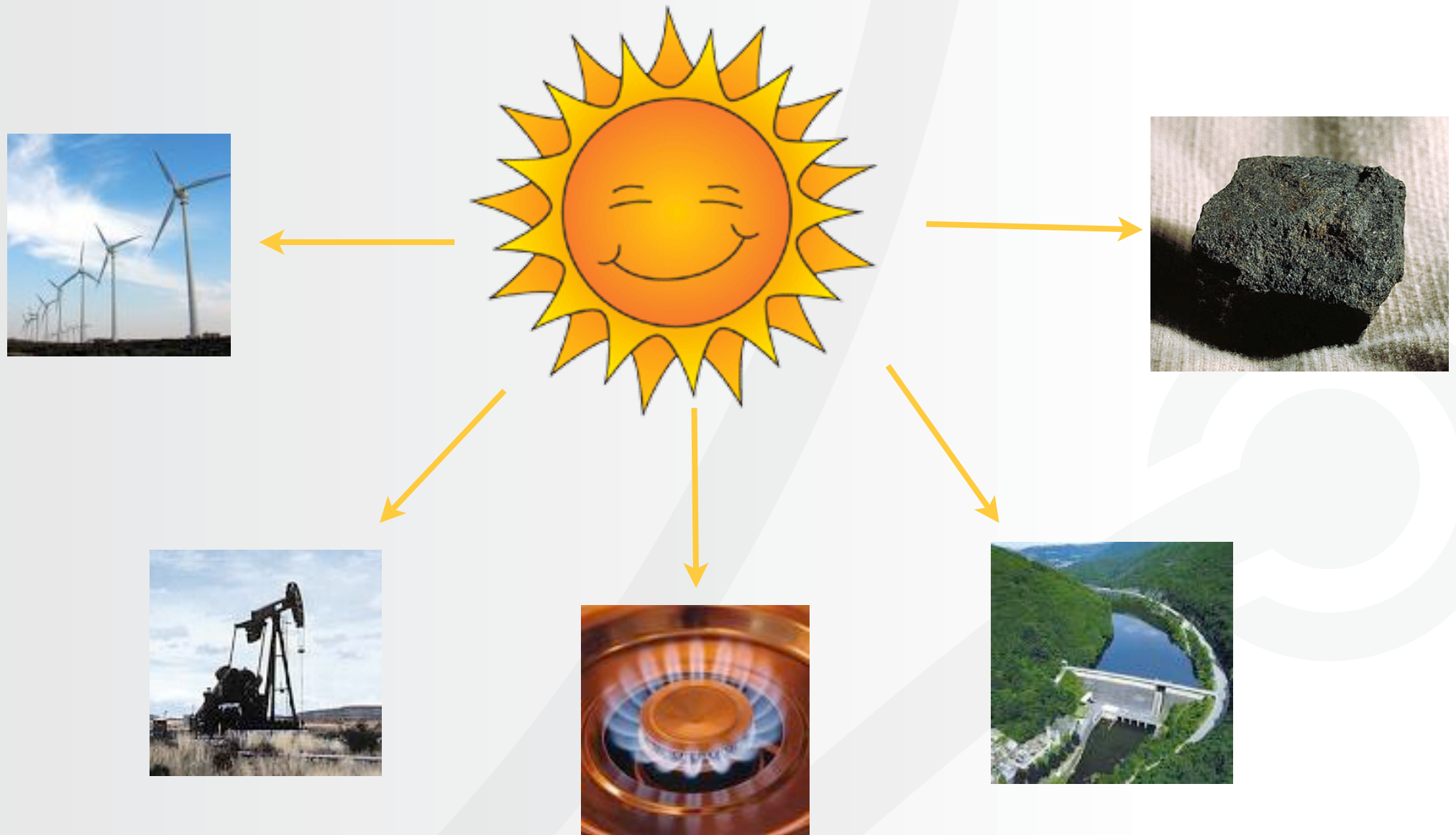


...then congratulations, you already own a solar powered car.

Don't believe me?



Almost all energy we use today is a by-product of solar radiation





“Thanks for the history lesson, but I’d like to fill up my tank more than once every million years.”

Don't assume that batteries are the only “renewable” way of storing energy



What does this mean for your car?



- Cars are engineered for comfort, rather than idealistic standards.
 - I want to drive fast
 - I want to drive far
 - I don't want to wait to refuel
 - I want lots of room

What solar fuel fits these needs perfectly?



Unfortunately, the answer is gasoline

We built our entire economy on the best fuel available, and now we have to downgrade.

Fuel Contenders: Batteries

- Cheap and clean
- Electric motors are very efficient at generating motion.
- Energy density is horrible, 200 miles of battery power weigh 1000 lbs



Fuel Contenders: Hydrogen

- Low energy density, compression requires cooling
- Clean to create, clean to use
- Should be fast to refuel



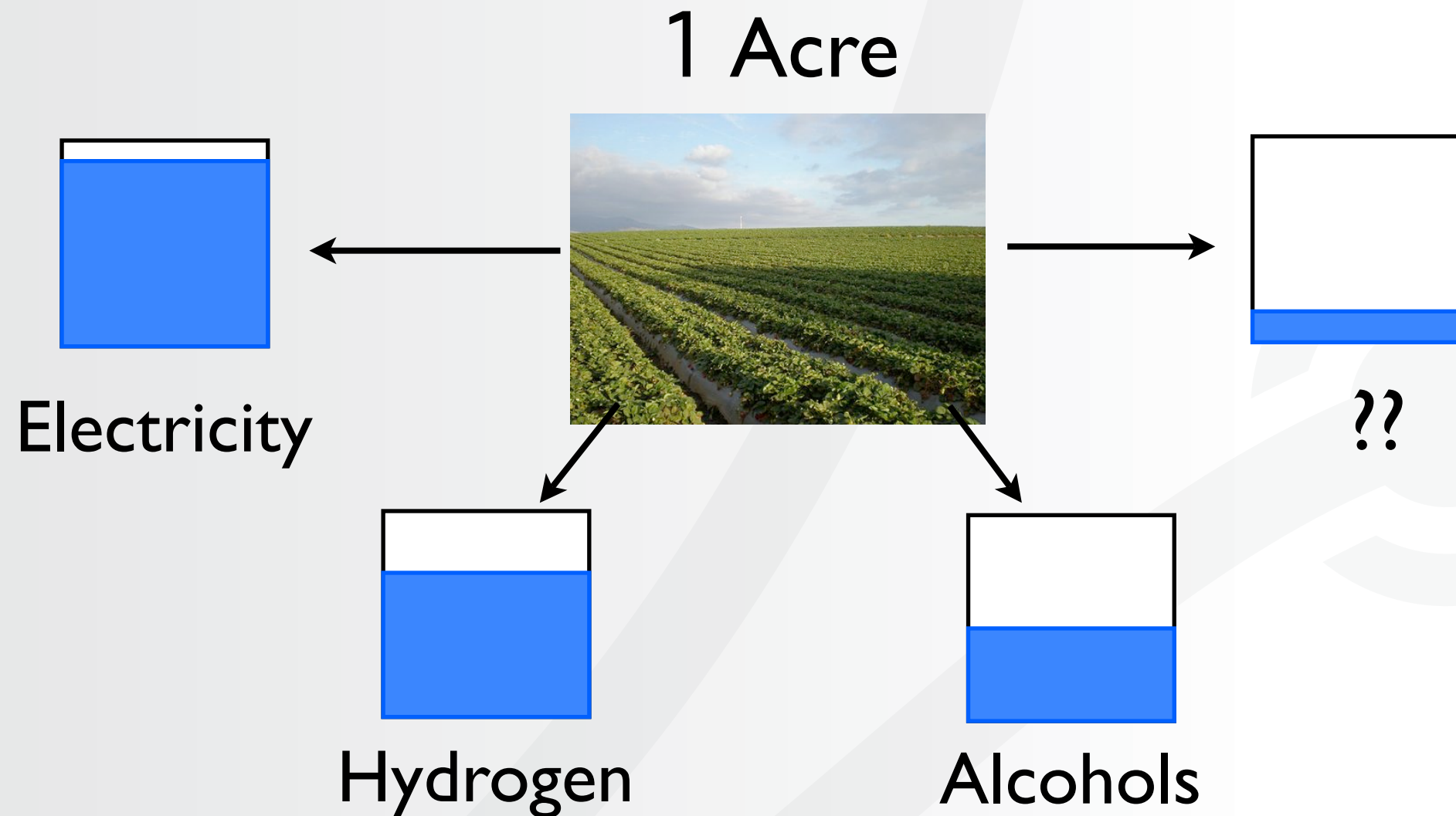
Fuel Contenders: Alcohols

- High energy density; would need a 15 gallon tank to match a 10 gallon gas tank
- Generates pollution as exhaust from being burned
- Existing technology and infrastructure is ready to support it



Anything else?

- General rule of thumb is, the higher the fuel density, the more solar energy you need to create it





What will my next car run on?

Where does idealism clash with reality?

Does hydrogen have a future?



- Hydrogen only solves one problem with batteries (refuel rate), but introduces a more complex problem of building an entirely new infrastructure.
- Hydrogen is more suitable for low temperature environments

How much alcohol can we make?



- Ethanol production competes with food production, can we spare the land?
- Algae might prove to be the holy grail for generating alcohols

Can batteries get better?



- Batteries need to reach 5-10 minute recharges. Right now you'd be stuck at a station in Kansas for 3 hours driving cross country.
- Densities need to improve to increase distance and give people back their trunks



And the winner is!

Alcohols...for now

(Ethanol / long chain hydrocarbons)

- Alcohol is our natural transition beyond gasoline. Brazil has already made the transition.
- Electric cars will take over once they become “roadtrip ready”.