



Learning Goal

- Be open minded about piped fuels and decarbonization of the existing fuel delivery system
- Understand that electrification is not the only strategy in cold climates
- Realize that a balanced approach considering how we move from the status quo to a low carbon system is necessary to limit economic disruption and harm to the people we are supposedly trying to help
- This can be a win-win achieving both climate and economic goals

Guiding Principles of a Balanced Energy System

- Reliability
- Affordability
- Decarbonization / Efficiency
- Respecting Sound Science
- Equity and Inclusion
- Integrated Policy

ROAD TO DECARBONIZATION

U.S. ELECTRICITY MIX

ELECTRICITY GENERATION BY STATE (2020)

The U.S. has made some bold decarbonization pledges, including a carbon pollution-free utilities sector by 2035.

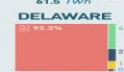
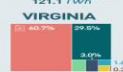
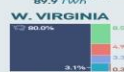
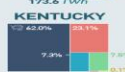
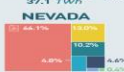
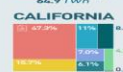
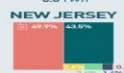
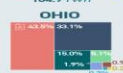
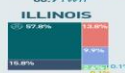
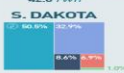
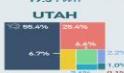
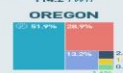
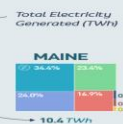
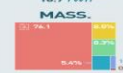
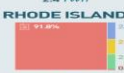
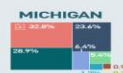
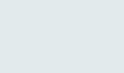
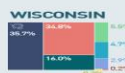
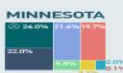
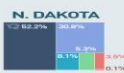
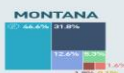
While some states are getting close to eliminating fossil fuels, others have a lot of work to do.



HAWAII and ALASKA are the only states that generate more than 8% of electricity from oil.



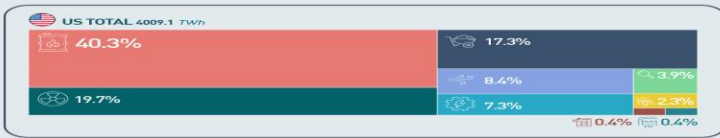
Water-plentiful regions like the PACIFIC NORTHWEST and NEW ENGLAND generated the most hydroelectricity.

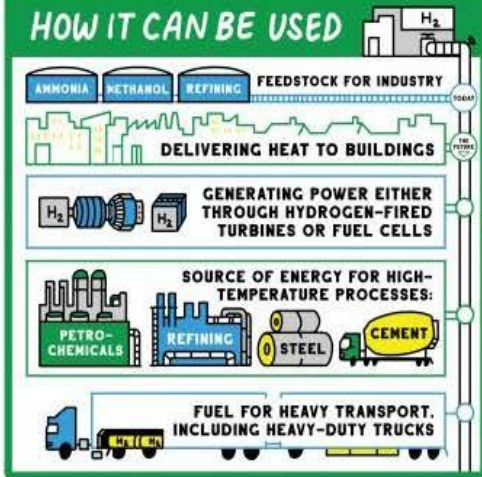
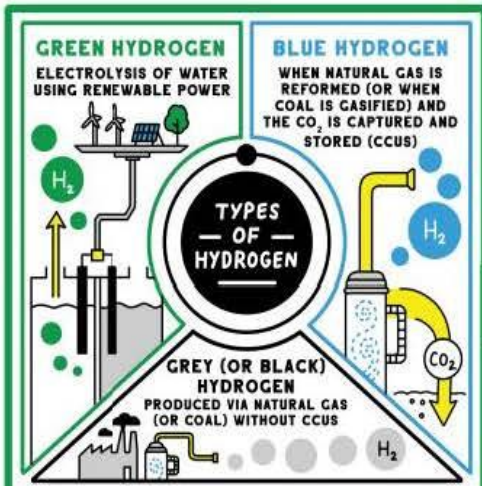


NEVADA and CALIFORNIA are the biggest producers (in %) of solar and geothermal energy.

The biggest producers of wind energy are all located in the Great Plains (KANSAS, IOWA, OKLAHOMA).

TEXAS accounts for 12% of total electricity generated in the U.S.

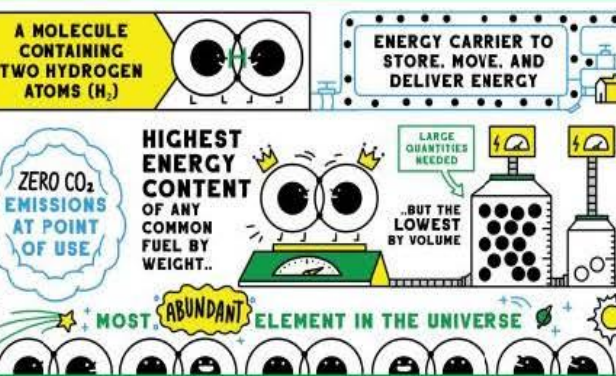




Energy Illustrated

HYDROGEN

— WHAT IS HYDROGEN? —



HYDROGEN IN A NET ZERO WORLD 2050

ACCOUNTS FOR AROUND 16% OF (COMBUSTED) TOTAL FINAL ENERGY CONSUMPTION

58 BILLION BILLION JOULES OF ENERGY PER YEAR - THE EQUIVALENT TO NEARLY 2 MONTHS OF THE ENTIRE WORLD'S ENERGY DEMAND

25% TRANSPORT, 40% INDUSTRY, 18% POWER, 17% BUILDINGS

100% FROM GREEN & BLUE HYDROGEN

BOTH ARE IMPORTANT TO AVOID TAKING AWAY RENEWABLES FROM A KEY JOB IN DECARBONISING POWER SECTOR

DECARBONISE

THINGS DIFFICULT TO ELECTRIFY SUCH AS STEEL MANUFACTURING

SOURCE: bp's ENERGY OUTLOOK

For more information please contact:

Neil J. Skidell
Managing Director, Green Solutions
The Par Group
516.394.2034
nskidell@pargroup.com