

REDNECK ENERGY GENERATION

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BE A JUNKYARD MACGYVER

- Maybe you want to help unprepared neighbors
- Maybe you're a prepper with not enough money/time
- Maybe you're prepared but want a backup plan
- Maybe an EMP took out your nice, expensive solar array
- Maybe you just want more power (Tim Toolman grunt)



ENERGY IS MORE THAN ELECTRICITY

- What is your goal?
 - Keep cool/warm?
 - Hot shower?
 - Cook food?
 - Have light?
 - Charge phone?
 - Keep food from spoiling?
 - Transportation?



How does he do that with his foot?

ENERGY IS MORE THAN ELECTRICITY

- Keeping the goal in mind helps you avoid the rut of the same old solutions, helps you get creative
 - Solar electricity to heat water?
 - No. Heat direct instead.
 - Gasoline to run refrigerator?
 - No. Preserve food other ways.
- Generate, but also conserve energy



How does he do that with his foot?

SOLAR YARD LIGHTS

- Light
 - Unscrew the top, bring inside for a candle
- Charge phone
 - Take the battery out of them to connect to a car USB charger



SOLAR YARD LIGHTS

- In almost every yard in America
- Rainproof
- Not obviously prepper
 - Not likely to be stolen
 - Doesn't make you a target to be robbed
- Low power
 - 5-10% charge per day
 - Send a few texts
 - Make a quick call
 - Check email
 - Look up 2-3 websites
 - Read your phone's map
 - Read part of an eBook in airplane mode



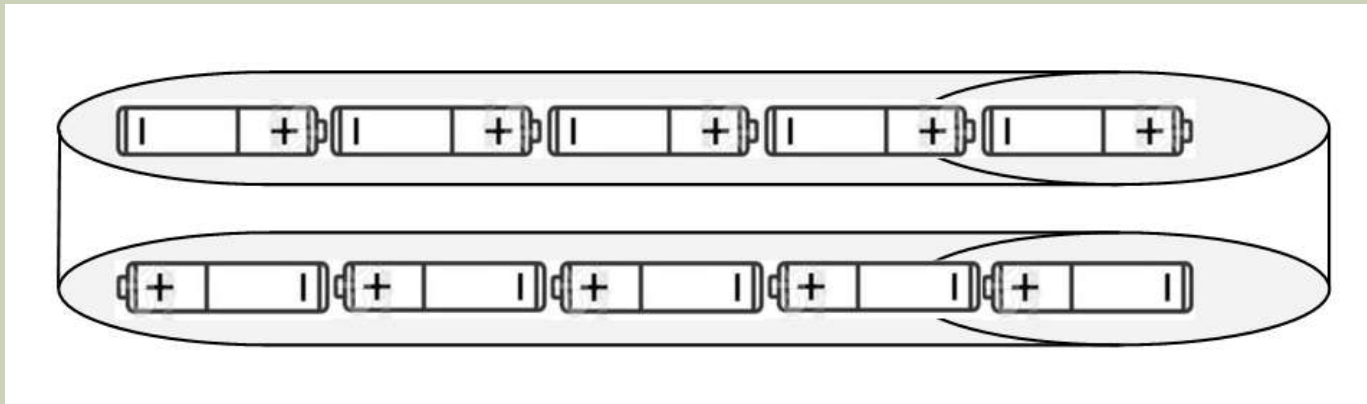
SOLAR YARD LIGHTS

- Look for AAA inside, not 2/3 AA
 - Written inside, unscrew top, or on label
 - 2/3 AA can be used but not ideal
- Access battery using tiny screwdriver or knife tip
- Stagger charge times. Some inside being used, more outside recharging.



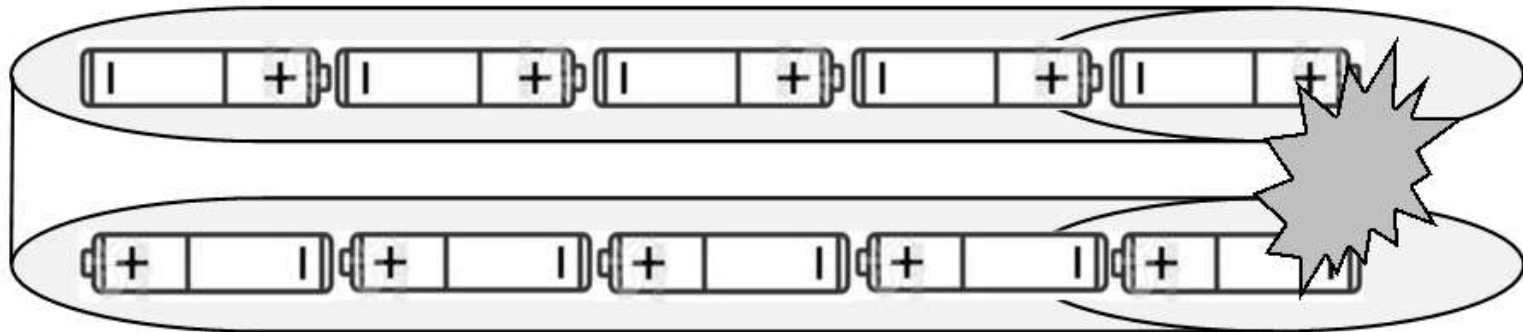
SOLAR YARD LIGHT PHONE CHARGER

- Lay down five AAAs on a sheet of paper, bump side left
- Roll the paper halfway to make a tube and tape
- Repeat on other half with 5 AAAs facing the other way
- Cut paper so batteries are about a half inch inside both ends



SOLAR YARD LIGHT PHONE CHARGER

- Cram foil in one end to contact both tubes of batteries



SOLAR YARD LIGHT PHONE CHARGER

- Cut two wires about 12 inches, strip ends with knife or lighter
- Bunch foil around one of the tips of each wire
- Tape one wire to charger tip (positive), one to side (negative)
- Stuff foil and wires into tubes, bump side is positive
- Fold and clamp end with rubber band to keep tight



SOLAR YARD LIGHT PHONE CHARGER

- Buy these for \$3.41, no assembly required
 - Need fewer solar lights/batteries
 - But gives even lower power
- USB emergency AA charger
- Two AAA-to-AA adapters



POWER YOUR HOUSE FROM YOUR CAR

- Turn your car into a generator
- Connect inverter to your car battery
- Some cars have one built in, check the junk yard, look for standard power outlet inside the car
- Need 800W+ to power refrigerator, fans, lights, and cell phones

1000W 12V 110V 60HZ



POWER YOUR HOUSE FROM YOUR CAR

- Extension cord to run into house, power strips to distribute to devices
- Tape down wires, trip hazard
- Fridge does not need to run 24/7
- An external refrigerator thermometer such as [this](#) can watch temps
- Cover fridge with blankets
- If possible, use a [steering wheel lock](#) or don't run unattended

1000W 12V 110V 60HZ



POWER YOUR HOUSE FROM YOUR CAR

- [\\$31 on AliExpress](#)
 - Search for 110V 60Hz 12V inverter, double-check stats and confirm it has US or universal power outlets
 - 1000W (2000W peak) recommended to not overload alternator
 - Modified sine is okay for short-term emergencies
 - Pure sine is not much more expensive
- Listen to [this](#) and [this](#) podcast for many small details and tips

1000W 12V 110V 60HZ



SOLAR OVEN

- Need foil (such as the inside of a potato chip bag)
- Picture frame
- Two boxes
- Newspapers
- Tape
- Glue
- Print [these instructions](#)
- More ideas [here](#) and [here](#)
- Clear plastic bags can be used instead of glass, [put pot inside bag](#)



HAYBOX

- Conserve precious cooking fuel
- Start a pot cooking then put in haybox to finish the job
- Can be made from hay or pretty much any insulation. Blankets, fiberglass insulation, newspapers...
- Read more [here](#) and [here](#)



ROCKET STOVE

- More efficient burn
- Just need small twigs
- Or anything flammable
- Can be made from scrap
- [Read this](#) for making one from tin cans



ROCKET STOVE

- Common mistake: Chimney made of rock/concrete/sand/etc.
 - Heat goes into chimney, less into food
 - Insulation inside chimney
 - Several materials to choose from
- Common mistake: Short chimney
 - Total height at least 3x larger than burn chamber
- Common mistake: No grate under unburnt wood
 - Need airflow along all sides
- Read and understand these principles
- More designs here and here



SOLAR SHOWER

- Need a soda bottle, black trash bag, rope, and pulley
- Cut bottle in half
- Push bottle neck through bag
- Drill holes in cap near the top
- [Watch this video](#) but tripod is not necessary. Hang from tree.
- Shower in the evening when water is hot, go to bed fresh and cool
- Also warm water from stove



COMPOST WATER HEATER

- Build a compost pile for the garden, get free heat
- Compost digests (ideally) between 130-160F
- Use mixing valve to avoid scalding
- Read [this](#) for more



COOL THE PERSON, NOT THE ROOM

- Freeze water in soda/water bottles, wrap in towel, keep next to skin
- Personal fans
- Spray water bottles
- Frequent showers
- Build a sleeping porch from scrap lumber and screen
 - If you use cots or hammocks, can put them away to allow daytime use of the porch



COOL THE PERSON, NOT THE ROOM

- Hang out in a basement
 - Floridians can dig a root cellar
- Sleep outside in a camping tent
 - Tarp high over for rain
 - Lots of breeze
- Go swimming
- Make hammocks from sheets
 - Great with a sleeping porch!
- Wet sheets in front of doors and windows



WARM THE PERSON, NOT THE ROOM

- Sleep in a tent indoors
- Or make a tent from tarps
- Other survival uses for indoor tents
- Sleep inside zipped-up sleeping bags
- Or make bags from blankets
- Sleep with winter hats on
- Sleep in pajamas
- Electric blankets inside bags
- Hot water bottles inside bags



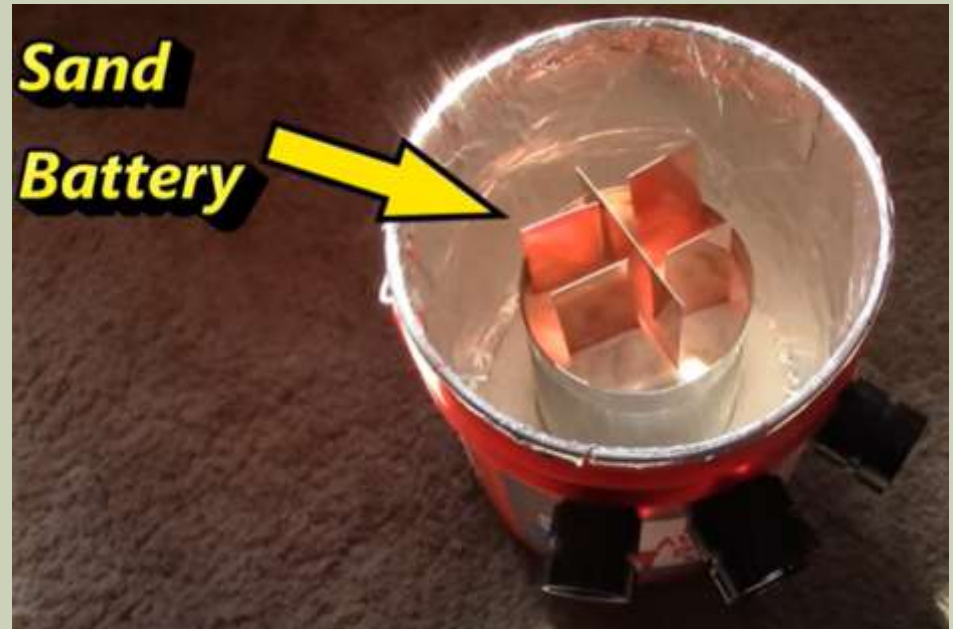
SOLAR ROOM HEATER

- [This design](#) uses soda cans painted black
- Requires Plexiglas which may not be available, so use what you can find. Sheets of glass or clear plastic tarps would work, even if less effective.
- He puts a hole in the wall, but you could place against a slightly-opened window and heat would rise up inside.
- [Instructions](#)
- More ideas [here](#)



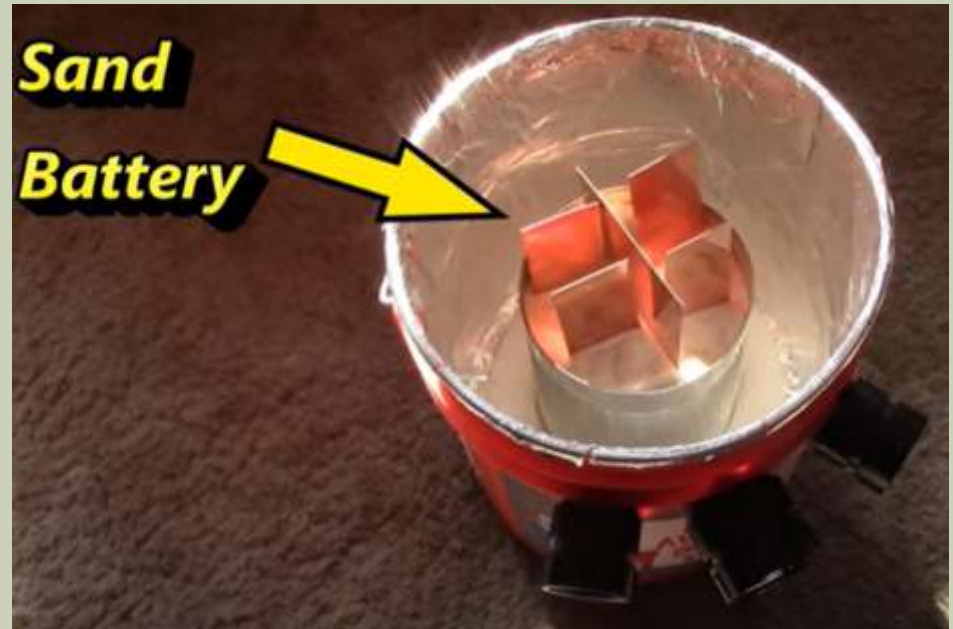
SAND HEAT BATTERY

- Store heat to use later
- Solar or fuel heat
- Capture sunlight, stay warm at night
- Make hot water
- Holds up to 500F
- Releases slowly over time



SAND HEAT BATTERY

- Watch [this](#), [this](#), and [this](#)
- Alternatives to copper sheet: Aluminum, steel, iron, any conductive metal, though less effective



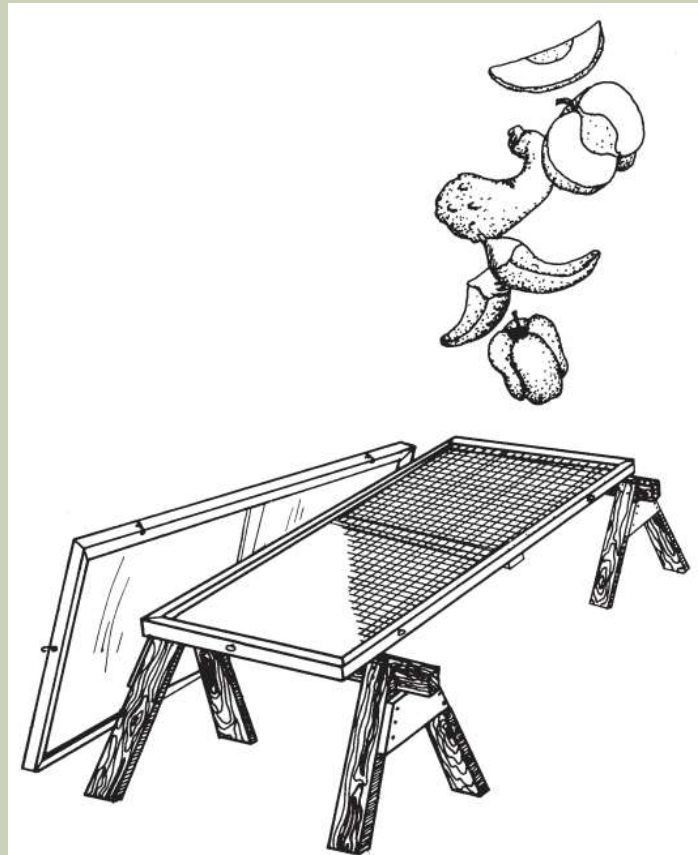
ROCKET MASS HEATER

- Heat your house using a few small sticks
- Like a rocket stove, but you do want to use heavy materials for the chimney
- Make from mud, rock, concrete, etc.
- Read [this](#) and watch [this](#)
- Can be [combined with a rocket cook stove](#)



SOLAR FOOD DRYER

- No refrigerator?
- Dry it, you'll like it 😊
- Numerous [drying recipes](#) online
- Many solar dryer designs [here](#) and [here](#)



ROOT CELLAR

- Earth is cooler and acts like a weak refrigerator
- Can also use for fallout, tornadoes, or just escaping hot days
- This design uses mostly sand bags



GENERATOR FROM LAWNMOWER

- Connect an alternator to a lawnmower engine with a belt
- Generates 12V DC, add an inverter to get 110V AC power
- Watch [this](#) and [this](#)



RECONDITION DEAD BATTERIES

- Lead batteries can be reconditioned using [distilled water](#), [baking soda](#), and [Epsom salt](#), or a [stick welder](#)
- [Make distilled water on a stove](#)
- No battery charger? Use an alternator from a running engine.
- Sometimes Epsom [works](#), sometimes it [doesn't](#)
- Watch the above, [this](#), and [this](#)
- Read [this](#) and [this](#)
- Shorter life, reduced capacity



ALCOHOL FOR ENGINES

- Moonshine—yes, also for drinking 😊
- 100% legal with a free permit
- Make using junk yard parts
- From corn, sugar, fruit, most anything with calories

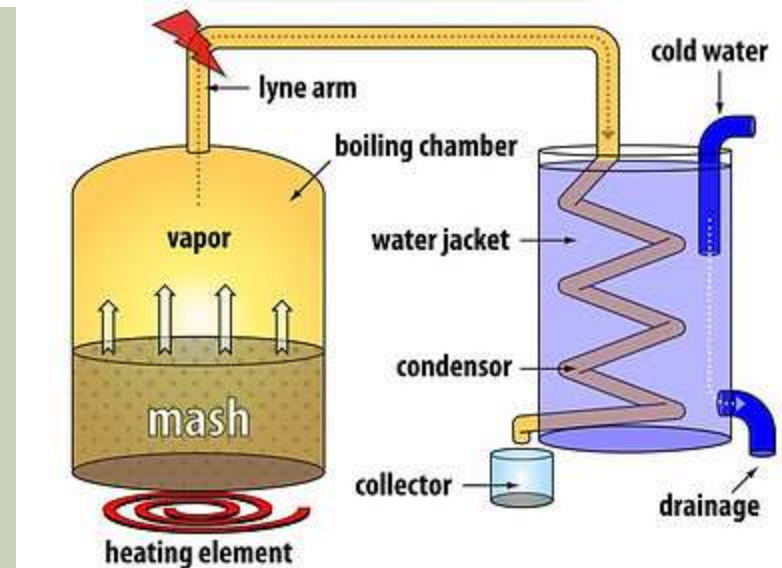
*Alcohol still made
from copper tubing*



ALCOHOL FOR ENGINES

Principle of operation

- Make sugary water (mash)
- Put in yeast (can be gathered from air)
- Let ferment for a week
- Heat mash
- Capture and cool vapors
- Cool
- Repeat heat/capture/cool until fully refined



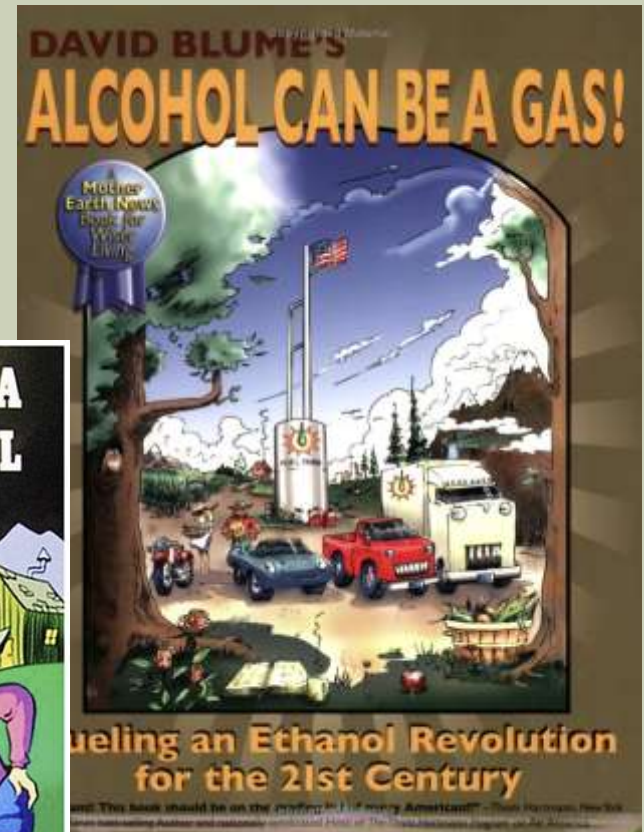
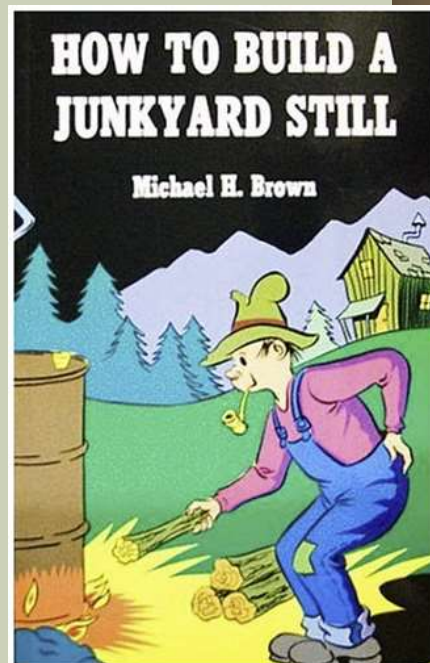
ALCOHOL FOR ENGINES

- Requires engine modifications
 - Unless FlexFuel
- Not a money saver
 - Costs approximately same as gasoline, not counting labor



ALCOHOL FOR ENGINES

- Read [this](#) and [this](#)
- Excellent book: [Alcohol Can Be a Gas](#)
- Also: [How to Build a Junkyard Still](#)



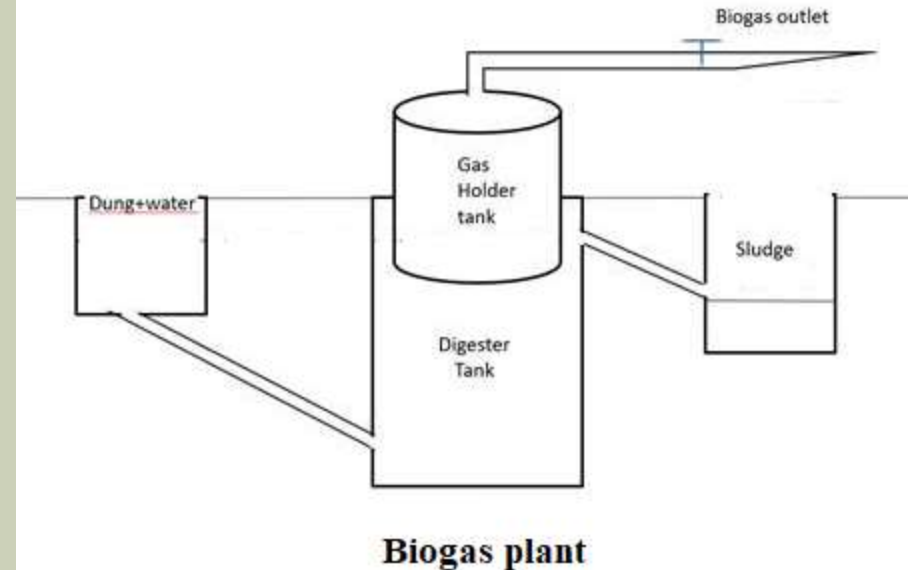
BIODIESEL

- Turn waste cooking oil into fuel for any diesel engine
- Not a great idea today, too much competition for used oil
- But maybe you'll come across used oil in the apocalypse
- Watch [this](#)
- Read more [here](#)



BIOGAS

- “Bartertown” in Mad Max III
- Poop to biogas and fertilizer
 - Mostly methane
- Use biogas to heat, cook, or run a generator
 - Use a tri-fuel generator
 - Or a conversion kit
 - Or bypass the carburetor



Two turds enter, stove fuel leaves

BIOGAS

- Make one from three barrels
- Read this, watch this, and watch this
- How to modify a propane stove to burn biogas



WOOD GAS

Pros

- Run your car or generator on wood
- Very well-tested. Used often during WWII.
- Fuel everywhere
- Build from junk yard parts
- Great for generators when heat can also be used
- Byproduct is almost pure carbon, good for biochar



Bundesarchiv Bild 183-108870
Foto: o.Ang. | 1940

WOOD GAS

Cons

- Toxic carbon monoxide fuel
- Explosion risk
- Bulky
- Slow startup/cool down time
- Labor of chopping trees
- 50% less performance
- If gas is not cooled, can melt plastic intake manifolds
- If gas is not cleaned tar can seize engine
- Wood has to be dried first



Ferrari ain't gonna make one any time soon

WOOD GAS

Principle of operation

- Smoke has 2/3rd of wood's energy, mostly flammable carbon monoxide
- Capture smoke
- Filter out contaminants
- (Optional) cool gas
- Use blower to force gas into engine

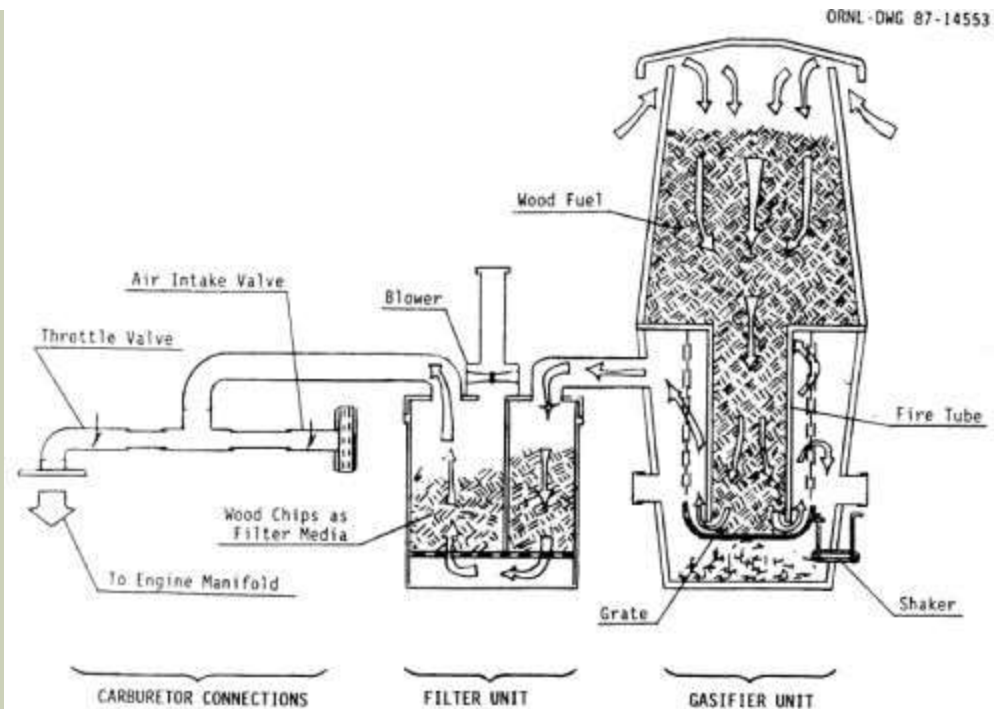
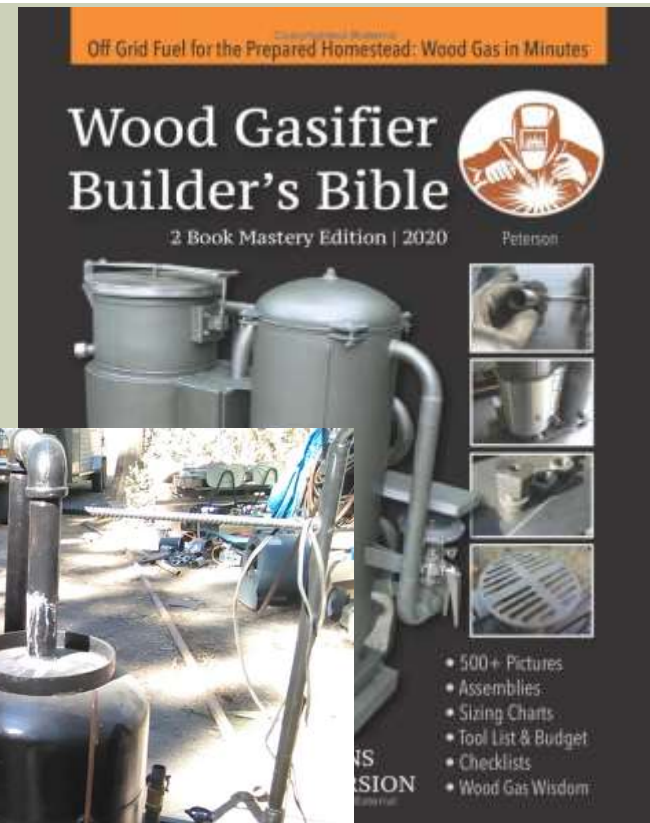


Fig. S-1. Schematic view of the stratified, downdraft gasifier.

WOOD GAS

- **Use the buddy system when working with it**
 - Learn and watch for carbon monoxide poisoning symptoms
- Make one from [old propane jugs and barrels](#)
- Or build [this one](#) without welding ([companion article](#))
- Read more [here](#) and [here](#)
- [Wood Gasifier Builder's Bible](#) is the go-to book



CONVERT PLASTIC TO FUEL

- Plastic or anything containing carbon. Plants, poop, anything.
- Like “Mister Fusion” from Back to the Future
- This guy lives on an island and runs his generator from what washes up on the beach



Great Scott!



CONVERT PLASTIC TO FUEL

- Similar to how oil is converted to diesel and gas
- Plastic into a sealed metal container
- Heat container to 750F+
- Pressure and heat without oxygen causes pyrolysis
- Capture the escaping vapors
- Cool down vapors, condenses to liquid
- Capture in stages to create gasoline, diesel, and kerosene
- Use the excess heat for other purposes



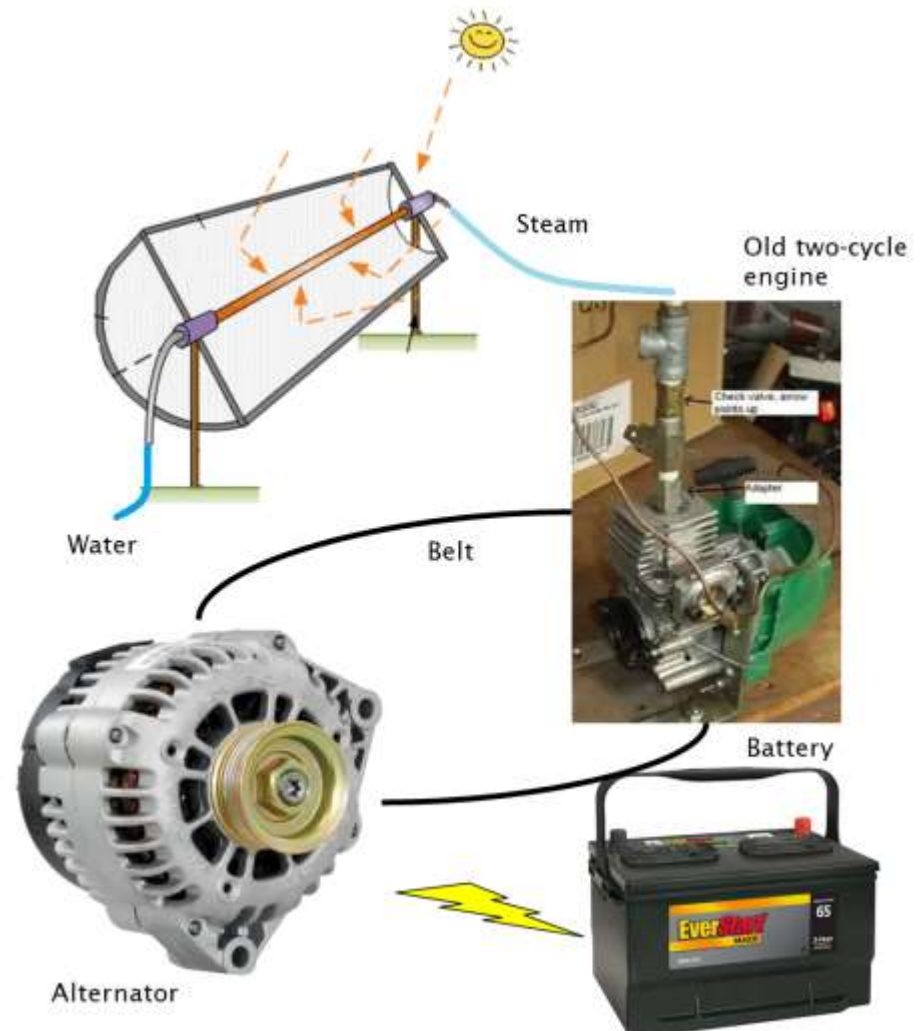
CONVERT PLASTIC TO FUEL

- Contaminants
 - Only run in engines you can disassemble and clean
- Pollutants such as heavy metals
 - Consider why you're surviving, and the world you want your grandkids to grow up in
- Uses more energy than is obtained
- Byproduct is nasty sludge
- Not a lot of resources teaching DIY
- Watch [this](#), [this](#), and [this](#)



SOLAR POWER WITHOUT PANELS

- Experimental
- Make from old weed eater, foil or space blankets or mirrors, tubing, a screw, and plumbing fittings
- Use solar or rocket stove to heat water and make steam
- Spin modified two-cycle gas engine
- Engine turns belt
- Belt spins an alternator
- Alternator charges battery



SOLAR POWER WITHOUT PANELS

- **Explosion hazard**
 - Surround generator with concrete blocks, bricks, sandbags, or piles of dirt
- This gentleman has done it, but with hard-to-obtain materials such as the mirrored sheet and a purpose-built steam engine

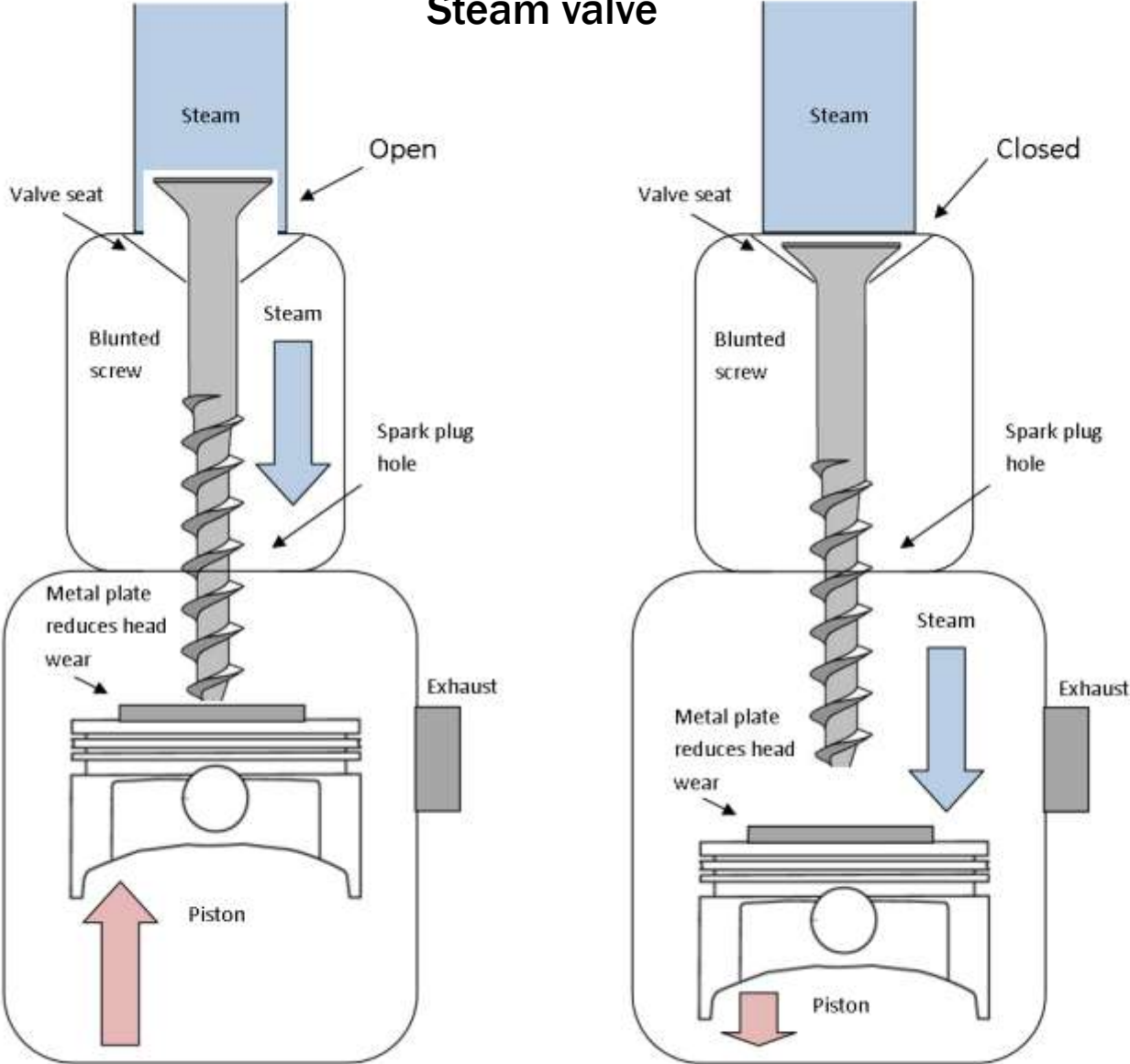


SOLAR POWER WITHOUT PANELS

- Use [Mylar space blankets](#), foil, or mirrors
- Or make a [tube magnifier](#)
- Or use a rocket stove
 - Coiled copper tube wrapped around stove chimney heats water
- [Convert a broken two-cycle engine to run on steam](#)
 - Even dead two-cycle engines should work, as long as the rings are intact
- Read [this forum thread](#)



Steam valve



Up stroke

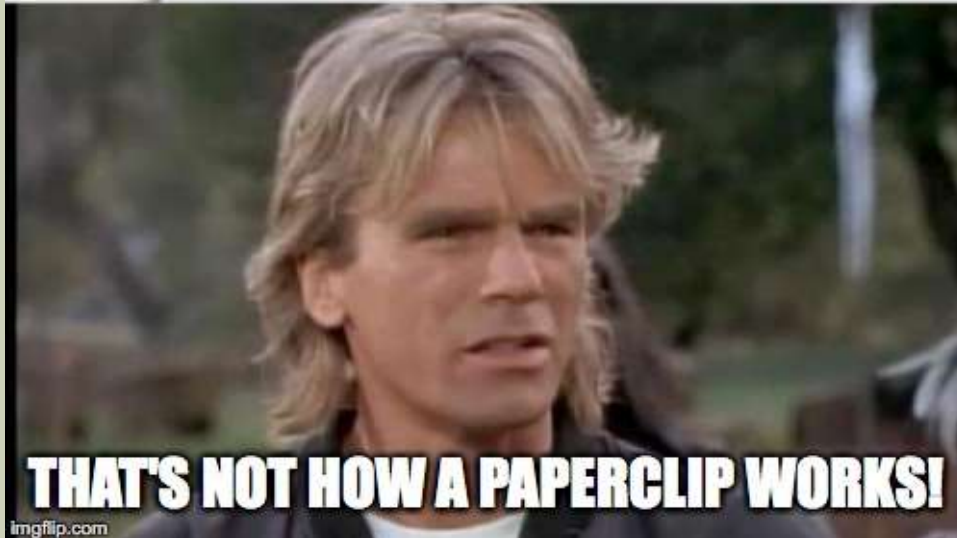
Down stroke

WHAT SHOULD I DO TODAY?

- Download this presentation
- Buy one (or more!) AA emergency chargers and AAA-to-AA adapters, \$3.41 each
- Buy one (or more!) \$32 inverters
- Download and print articles and ebooks. More resources on the next slide.
- Bookmark the videos
- Watch one video
- Make a paper tube phone charger



RESOURCES



- Paul Wheaton
 - [Permies.com](#)
 - [RichSoil.com](#)
- [Journey to Forever](#)
- [Build it Solar](#)
- [GREENPOWERSCIENCE](#)
- [Robert Murray-Smith](#)
- [WayPoint Survival](#)
- Steven Harris' talks [here](#) and [here](#)
- [SolarCooking.org](#) (more than just solar cooking)
- [CD3WD](#) (LOTS of cool stuff)