

JOURNAL OF

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WATER – THE ABSOLUTE BASIC

WATERBRICKS
for Safe Water Storage

RADIOACTIVE WATER

DO'S AND DON'TS
on the coronavirus

**VECTOR & ZOOONOTIC
BORN DISEASE**

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PRESIDENT'S MESSAGE



TACDA Members,

We appreciate your continued support for The American Civil Defense Association, and we hope that you will inform your family and associates about the valuable information and guidance that you receive through this organization. I know that I benefit from the information and resources available through TACDA.

The recent concerns that we have faced due to the novel

corona virus that is now causing fairly significant disruptions in trade and travel illustrate a very important point; you never know when and how disasters can strike. This should be a very important lesson for us individually and for our society. We should put more emphasis and a higher priority on carefully and consistently preparing for potential disasters.

I wish you well in your efforts to prepare.

Sincerely,

Jay Whimpey, PE
TACDA President

FROM THE EDITOR

Why Civil Defense?

*By Roseanne Hassett
Executive Director*

Civil defense is defined as “an effort from ordinary people to protect the citizens of a state (generally non-combatants) from military attacks and natural disasters. It uses the principles of emergency operations: prevention, mitigation, preparation, response, or emergency evacuation and recovery.”

Many people erroneously think of civil defense as an arm of our government that takes care of its people in a disaster. They assume they should have no fear in an emergency because someone will be along in no time to ‘save’ them and bring them food, water, and shelter. If you have paid any attention to the disasters in our nations recent past or within other countries, you will have the foresight to know that in the event of an emergency or disaster, *you* will have to take the lead on the care and physical needs of yourself and your family until help arrives.

The latest catastrophe to plague the United States is of course the novel coronavirus. As the virus has spread, panic has stricken many people into activities such as hoarding and ‘runs’ on stores to gather supplies. These behaviors lead to stock shortages on important items that are needed in emergencies and leave the unprepared wanting.

If there is one thing that we would like every human being to know, it would be to prepare, prepare, prepare! If you are prepared with storage of water, food, medical supplies, and other emergency items, you will be far ahead of the average citizen. You can rest assured that your family will be safe and have

Continued on page 24

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WATERBRICKS

for Safe Water Storage

By Bruce Curley

NOW AVAILABLE IN OUR SURVIVAL STORE

<https://tacda.org/product-category/emergency-water-storage-containers/>



What are waterbricks?

While clean, safe water is essential to life, it is not always readily available. Considering that you can live for approximately three weeks without food, but only three days without water, you must have access to clean water... always. To make sure you have a safe water supply that is stored correctly that is clean and pure when you need it, consider using WaterBricks.

I have used WaterBricks for almost 10 years and find them rugged, easy to fill, carry, and stack, and very dependable. As they explain on their website, (<https://www.waterbrick.org/about-us/>) "WaterBrick is a container. But not just any container. Utility Patented design is uniquely multi-functional and wildly strong, serving many needs."

With every disaster, the first item that disappears from store shelves is water bottles. By keeping WaterBricks in your survival supplies and part of your grab and go kit, if you must flee, you just grab a few and put them in your car or truck to use on the journey.

I am on a well, so I have to have a good source of emergency water. These are the best water storage items I've found. They are like water LEGO's that stay in place, don't leak, and protect water for a very long time.

How you can use waterbricks?

WaterBricks make water storage easy. They can be stored virtually anywhere such as bedrooms, basements, kitchens, living and family rooms, or closets.

They are available in two sizes: 3.5 gallons and 1.6 gallons. This allows for long-term storage and short-term use. Each brick also has a sturdy, comfortable handle for carrying, as well as a rugged screw-on lid. This lid can be removed, and a spigot lid added to regulate the flow of water out of the container.

Water supplies can be cut off or contaminated during emergencies or disasters. That is a fact. Water is essential to health and life. Most people use 3 to 4 gallons of water a day. If your water supply is cut off, you will need to have access to at least that much water each day.

Once in a power outage I brought the 1.6-gallon containers up and placed them in my bathroom and my kids' bathrooms. I installed the spigots, and they were very easy to use to brush our teeth, wash our faces, and drink.

Due to the sleek design and comfortable, easy-grip handle, WaterBricks can be easily carried individually or two at a time. They work and act like bulk storage but carry like containers.

You can take them wherever you need them. You can load one in the trunk of your car for emergencies, as I do in my car and in my wife's and children's cars. You can fill them with water, sand, or pea gravel and they will stop a bullet. You can use them dry to maintain a waterproof enclosure for storage. Or if you are camping or boating, you can bring a few along and have clean fresh water to drink, clean up, brush your teeth, wash your clothes, or any other activity that requires water.

Due to their LEGO like design, WaterBricks can stack as a cube or tower for easy storage or to build furniture or shelter. They can also be broken down to fit in closets or under beds. These unique water containers can also hold food and other life essentials like ammunition, grain, food, coins, alcohol, sandbags, and more!

CAUTION: Never store water in used plastic milk cartons, water bottles, or soda bottles. These items can easily break and become unsafe and unsanitary.

Standard size specifications

- 3.5-gallon container
- 9" Width, 18" Length, 6" Height
- Weight Empty – 2.52 pounds
- Weight Full – 30 pounds
- 150 can be cross stacked per pallet

Half size specifications

- 1.6-gallon container
- 9" Width, 9" Length, 6" Height
- Weight Empty – 1.17 pounds
- 300 can be cross stacked per pallet



Waterbricks features and specifications

- Portable and easy to carry
- Durable. Made of tough, textured BPE-free HDPE (high density polyethylene resin)
- Average wall thickness of container approximately 3/32 of an inch (.090)
- Stackable (cross stacks and interlocks for safety)
- Two interior conical reinforcement columns give stacking strength
- Interlocking male and female connectors
- Wide lid opening is 3 1/4" in diameter - can fit average adult hand
- Full rubber gasket included inside lid
- Recommended stacking height: 4 feet
- Meets FDA standards and BPA free
- Can be frozen to extend food life or preserve medications
- Save space (store under a bed, behind a couch, in a closet, etc.)
- Versatile. May also store bulk food (beans, rice, grain, oats, cereal, etc.)
- Useful for family and business events (parties, camping, and others)
- Available in blue or tan
- Cost: \$180 for 10 WaterBricks



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<https://tacda.org/product-category/emergency-water-storage-containers/>

Portable | Stackable | Durable | Safe Dry Storage

Portable

At 3.5 gallons, it is small enough to carry with you in a time of need or to fit under beds or in the refrigerator.

Stackable

Cross stacks and interlocks up to 4 feet high in closets or the garage to create a bulk storage system. Insert standard ¾ inch PVC through the internal columns of these stackable containers for safer stacking heights.

Accessories



WaterBrick Spigot - \$16.49

An often-overlooked feature of water storage is how you get the water you need when you need it. Water delivery from water storage involves pouring it out (often hard and wasteful) or using a water spigot.

The WaterBrick Spigot solves this problem. It easily screws on to any WaterBrick lid for convenient water access. It has a gasket that keeps it tight and prevents any leaking. Simply turn the handle to open and close. No ventilation hole required.

Durable

Industrial grade cross stacking WaterBrick water containers are durable enough to withstand a high impact air drop or be used as building blocks in transitional basic shelters. The Ultraviolet additive will extend the life up to 15 years.

Safe Dry Storage

Stores water, food, ammo or anything you want to keep dry. The resin used in this food grade container meets FDA standards and is BPA free making them safe storage containers for food and water. Not for fuels or oils.



Replacement Carrying Handle 2 Pack - \$8.90

Two eyelet hooks at the top of the unit make it easy to install and remove the handle if desired. It is ergonomically designed to be comfortable in your hand when carrying.

Water Preserve Concentrate- \$17.95

This liquid additive disinfects, preserves, and extends the safe storage life of emergency drinking water. 5-year storage guaranteed.

Since 2007, Bruce Curley has been a member of the Board of Directors, now Vice President, of The American Civil Defense Association (TACDA). Through the TACDA Civil Defense Journal and his analysis on his civil defense blog (poetslife.blogspot.com) for 20 years, he creates, teaches, shares and implements civil defense strategies. Bruce is a member of the Carroll County, MD, Community Emergency Response Team and is NIMS 101/102 certified. He wrote the Emergency Response Plan for his hometown of Mt. Airy, MD. He is a member of the Safety and Security Committee at his church where he has helped write the Emergency Response Plan and taught staff how to deal with the threat matrix. More of his articles can be found at <https://poetslife.blogspot.com>

Purchase your WaterBricks now!

Purchase and fill your WaterBricks now to avoid not having water in an emergency. Also avoid the panic of running to the grocery store BEFORE a hurricane, flood, earthquake, snowstorm, or power outage. You will have the peace of mind of knowing you and your family have clean water and, therefore, one less thing to be concerned about in the stress of an event.

For more information visit:

<https://www.waterbrick.org/>
<https://twitter.com/WaterBrick>
<https://www.facebook.com/waterbrick>
<https://www.instagram.com/explore/tags/waterbrick/?hl=en>
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<https://www.pinterest.com/source/waterbrick.org/>
<https://www.youtube.com/user/waterbrick>

WATER – THE ABSOLUTE BASIC

By Dr. Landon Beales

**“Water, water, everywhere...but not a drop to drink”
The Rime of the Ancient Mariner – Samuel Taylor Coleridge**

Recommendations for Water Storage

Storing water is as easy as turning on the faucet— as long as you store it before an emergency arises! If you wait until it's critical, then both frustration and costs increase – in direct proportion to the water's availability! The following are some basic recommendations to guide you in this fairly simple storage project.

Recommendation #1: Store water from the source you are currently drinking.

Family members are accustomed to its taste and mineral content, so adjustment to “new” water won't be necessary. There are enough other challenges during emergencies without being frustrated by your water supply.

Recommendation #2: Store your water reserves in new, thoroughly cleaned, heavy duty, plastic containers with tight-fitting lids.

Heavy, plastic containers have the major advantage of being shatterproof and lighter than glass bottles or jugs.

The federal government, through the Department of Transportation, has developed a rigid burst test and handling standard (DOT #34) for plastic containers utilized in the interstate hauling industry. Plastic containers in this classification are designed to specifications for strength and transportability when filled with liquids. Plastic containers meeting DOT #34 are available in many sizes, ranging from 5-gallon to 55-gallon models. Water

weighs eight pounds per gallon, so the 5-gallon container (at 40 lbs.) is about the maximum weight most people can carry – and just the right size for water storage. The 5-gallon container is designed for stacking to conserve space and is easy to handle for rotating your water supply.

If you don't have a storage space problem, the larger containers are better for consolidating and organizing water storage. If your storage space is fairly limited, smaller storage containers facilitate stacking and moving them more often. Shipping-grade water containers, when filled with water, are capable of withstanding both hot and cold outdoor temperatures. This is important if some of your volume of water must be stored outside the protected environment of your living space.

There is always a great temptation to “keep it cheap” and store water in used containers. The difference in price of acquiring and preparing used containers is comparable to acquiring new equipment, all things considered. It's not worth risking loss of your water supply by using containers of unknown origin and quality.

New containers should be sanitized. Rinse the new container with drinking water from a new, dedicated ‘drinking water safe’ hose (such as those used in campers). Rinse 55-gallon containers with a 50% solution of water and bleach. Wear rubber gloves and eye protection. Leave the bung filler cap slightly loose. Swish and roll the container so the bleach solution reaches all areas of the container. Let it sit for 10 minutes. Pour the solution back into a clean bucket and use it for the next container. Repeat the process. Pour out the solution before filling with clean tap water. The remaining bleach will ‘shock’ the

drinking water. You may wish to add ¼ c. bleach per 55-gallon drum of water before tightly replacing the cap on the bung. Wash off the outside of the drum with clean water so as not to damage clothing or nearby items with bleach. Bleach residue is dangerous to your health. Filter water at point of use.

Some of the major reasons for utilizing only new, storage-quality containers are:

- Water quality is more easily maintained
- Storage is neater and easier due to standard sizes
- Containers are less likely to break
- Supply is more transportable
- Supply is more easily rotated

Recommendation #3: Don't re-use lightweight, food-grade plastic containers previously filled with foods (ketchup, etc.), fruit or commercial drinks, milk, nonfood products (pet food, etc.), alkali-based or acid-based products (pickles, vinegar, household cleaners, etc.), or chemicals.

The residual taste and odor of previous contents is often retained in the plastic, even though not immediately detected by smell or color, and may eventually cause contamination of water supply. Water resources are too important for your survival to risk having a contaminated supply.

The thinner plastic utilized in the commercial food industry is designed to be thrown away after a single use. Many of these lightweight plastic containers meet only the minimum standards for bursting strength and durability and are not stable for long-term storage.

Commercial 1-gallon and 2 ½-gallon plastic water bottles were designed and utilized originally for water-based products and may be re-used for storing water in a protected (in-home) area.

Recommendation #4: Store your water supply away from paint products, all petroleum-based products, acids, or anything releasing objectionable odors, such as equipment, animal waste, fertilizers, etc.

The composition of plastic containers acts as a permeable membrane which “breathes”, allowing contamination of your stored water from strong odors, especially from petroleum-based products.

Recommendation #5: Don't use metal containers for water storage.

Cans without a special coating of enamel or plastic on the inside tend to impart an unpleasant taste to stored water, especially after lengthy storage. Water makes metal containers rust!

Recommendation #6: Rotate! Rotate! Rotate!

We can't emphasize this enough! Rotate your water supply as a means of continuously checking its quality and shelf life.

Water that is bacteria-free when stored in thoroughly clean containers will remain safe for several years. Tests of water quality after long-term storage showed that water stored properly for several years could not be distinguished by appearance, taste, or odor from water recently drawn from the same source. However, the principle of rotation is the best guarantee for monitoring stored water's purity and taste.

Water is not only relatively inexpensive and easy to store, but it also stores indefinitely when care is given to its selection and preparation!

Steps for Water Purification

Important: It is important to try to avoid pouring treated (purified) water back into a container which has just had untreated water in it. If possible, clean the container with chlorine water (about ½ tsp. per cup of water) for 2 minutes. Pour the cup of cleaning solution into a gallon container to be cleaned and shake/soak the inside of the container to disinfect it, then drain it and use it to put the purified water in.

Step 1 – Clarify the Water

Use a tightly woven cloth, or paper filters (such as coffee filters), as a filter to remove floating or suspended particulate matter or use a small amount of powdered alum (from the kitchen spice supplies) and sprinkle it on the surface of the water. Allow it to settle to the bottom and pour off the clear water into another container.

**Note: If the water is obviously 'crystal clear' with no suspended particulate matter, then this step is unnecessary.*

**Note: Suspended particulate matter tends to hold onto infectious agents and make them less vulnerable to iodine and chlorine.*

Step 2 – Biological Purity

Boiling

Boiling water is highly preferred over any kind of chemical additives. Cryptosporidium organisms are quite resistant to chlorine and iodine and are best removed from water either by boiling or filtration. Boil the water (heat to at least 158 degrees F) for 10 minutes. This will kill viruses, bacteria, and protozoal (giardia and cryptosporidium) organisms effectively. Boil water before drinking it or using it in food preparation.

**Note: It's hard to satisfy thirst (especially in children) with hot or warm water. If possible, cool the water before drinking.*

**Note: Use clean cooking pots and utensils.*

**Note: Fuel and fire may be in short supply, or it may be impractical to complete this process.*

Filtration

Filters vary greatly in quality and durability. Good filters are expensive (such as the Katadyne or MSR). Inexpensive filters may be used to remove chlorine from treated water, but will not be effective against all viruses, bacteria, cryptosporidium and other parasites. To effectively remove cryptosporidium, purchase a high quality filter with an absolute pore size of less than 1 micron. Note the use of the word, 'absolute'. Do not trust an inexpensive, poor quality filter.

GOOD quality filters against parasites will make such claims as: ABSOLUTE pore size of 1 micron or smaller; or Tested and certified to NSF/ANSI Standard 53 or NSF/ANSI Standard 58 for cyst reduction.

POOR quality filters will make such claims as: One-micron filter; Effective against Giardia; Effective

against parasites; Carbon filter or Activated carbon; Chlorinated; Removes chlorine; UV light; Pentiodide resins; Water softener; Water purifier; EPA approved, registered, or tested (the EPA does NOT approve, register, or test filters).

**Note: In order to prolong the life of the filter, clarify the water (with methods above) before putting it through the filter. Many filters claim to have tested their filter against clogging, with huge amounts of water. These tests, however, are misleading as they are normally done on drinking water, which has already been clarified.*

**Note: Arsenic, benzene, bromoform, herbicides, lead, mercury, MTBE, pesticides, radon, THMs, and VOCs, can be reduced or eliminated with a good carbon filter.*

**Note: Carbon filters should be thoroughly air dried before storing to prevent bacterial growth.*

**Note: Radioactive particles can be filtered from water with a simple 'clay' filter. *See the article, 'Radioactive Water' in the Journal of Civil Defense (April 2020).*

Chemical Additives

If fuel is unavailable and boiling is impossible, bleach or iodine may be used as an alternative process. Chlorine and iodine will kill most viruses and bacteria dependably. Cryptosporidium, however, is best removed by filtration or boiling. In general, the required levels of chlorine preclude the use of chlorine disinfection as a reliable method to control Cryptosporidium in drinking water.

Add 1 drop of household bleach per cup of water (4 drops per quart and 16 drops per gallon). Two drops per cup of water can be used for more severely polluted water. Only use household bleach (Clorox, Purex, etc.) made up of 5.25% sodium hypochlorite (with no other additives, fragrances, etc.). Or, add 2 drops of tincture of iodine per cup of water (8 drops per quart or 32 drops per gallon). Use twice as much chlorine or iodine if the water is badly polluted. Then, allow the water treated with chlorine or

iodine to stand 15-30 minutes. Longer times may be necessary for cold or cloudy water with up to 8 hours to destroy giardia cysts with 99.9% certainty. A good filter, however, will remove these contaminants to 99.9999% certainty!

**Note: If the treated water doesn't have the odor of iodine or chlorine, then add more of either.*

**Note: Iodine is more effective than chlorine for killing giardia cysts.*

**Note: Bleach deteriorates over time (changes to salt and water) and can only be dependably stored for about 1 year.*

**Note: A small amount of vitamin C (ascorbic acid such as in powdered 'Fresh Fruit') will effectively remove the iodine taste in the treated water.*

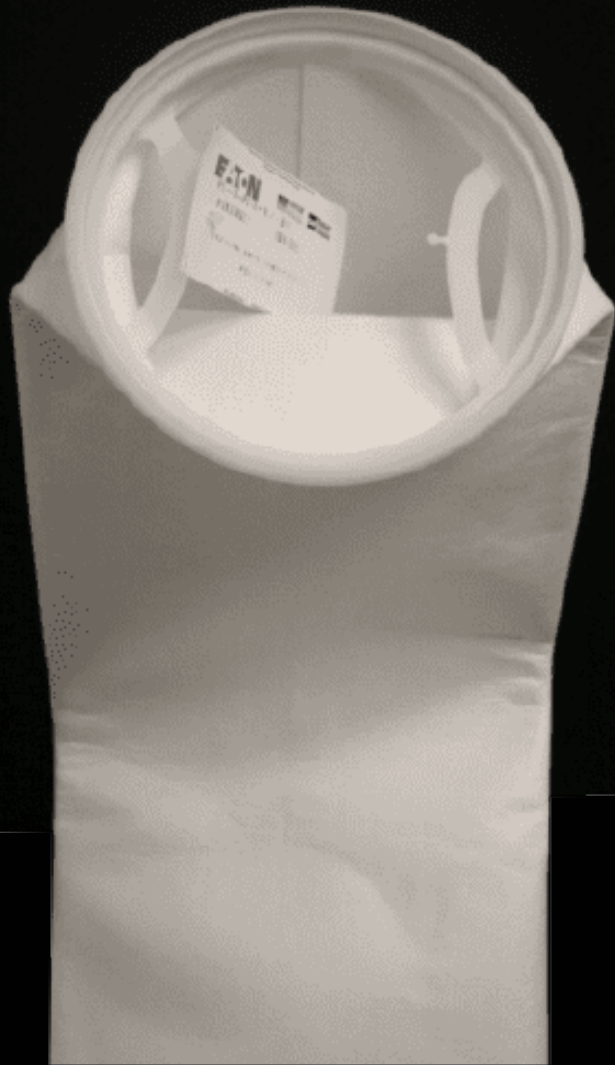
Pour the treated water through a carbon (activated charcoal) filter to remove the chlorine or iodine taste and chemical contaminants. (Carbon can be purchased in an aquarium supply department).

Dr. Beales was a member of the University of Utah School of Medicine clinical faculty in the Internal Medicine department for over 30 years. He has a special interest in the treatment of chronic fatigue and fibromyalgia syndrome. He enjoys exploring the back roads of Utah in his Jeep, camping with family and friends, being an amateur radio operator, playing his violin and working on cars.



Quick Guide – Emergency Water Resources

INTERIOR WATER SOURCES	
House source water	Best water to use in emergency. Everyone is familiar with taste, odor, mineral content, and quality of water. Know where to find main water valve for cut-off. Have proper valve key.
Water lines	Contain several gallons of water, depending on house size. Easiest water to access. Turn on faucet at lowest point in line. If water doesn't flow, also open the faucet at highest point in line.
Hot water heater	Contains 15-40 gallons potable water, depending on size. Open drain faucet at bottom of heater. You may need to screen or filter out sediment before drinking or cooking with it.
Tubs and sinks	Fill ahead of time when possible, for additional storage.
Toilet tanks (not bowls)	Contains 5-7 gallons in tank. Always treat (boiling is preferred method) before using. Caution: Not potable if commercial disinfectants or cleaners are used in tank.
Appliances	Use appliances for emergency water storage.
Refrigerator/ freezer	Consume cooled and frozen drinks & liquid sources (fruits, vegetables, etc.) first—they become less palatable over time during power outage. Ice cubes provide some drinking water; may also be important for first aid or to preserve food longer.
Water cooler, clothes washer, tubs, buckets, pots, and pans	Fill to capacity for additional reserves. Most of these containers will not be clean, and stored water must be purified.
Waterbed storage	<p>Controversial storage source: To use waterbed water for emergency purposes, follow these requirements:</p> <ol style="list-style-type: none"> 1. Use only a new mattress. 2. Fill Mattress with fresh tap water. 3. Add 2 ounces of bleach per 120 gallons of water (do not use toxic algae inhibitor solution!) 4. Rotate water at least yearly. 5. Test 3-4 times yearly for algae and toxins. 6. Not potable. Use water for cleaning purposes only.
EXTERIOR WATER SOURCES (Purification is recommended)	
Yard	Water hoses, buckets, barrels of rainwater, puddles, ditches, and troughs all may contain water.
Water hoses	Suspect contamination in all outside hoses. Hose may have been in buckets, barrels, ditches, or puddles. Hoses lying on the ground may have siphoned contaminated water or been infiltrated by small animals. Water in hoses must be treated, unless purchased new and dedicated for drinking water.
Hot water spa or swimming pool	Controversial source. Could provide both emergency and long-term storage. Use only for non-drinking purposes. Most likely contains chemicals.
Precipitation	Rain and snow provide water. If caught in clean containers, may be used for drinking, but purification is recommended.
Snow	First snow to fall contains environmental contaminants. Use only clean-fallen snow as a water source. For old snowfall, remove 'crust' and use protected snow underneath. Purification is recommended.
Surface water, lakes, streams, ponds, rivers	Collect water, then clarify, filter, and purify.
Ground water	Puddles, ditches, and any ground depression can contain water. All groundwater sources must be treated as contaminated.
Well water	Unless covered and used as primary water source, test before using. Check for contamination after any unusual disturbance to area.
Natural springs	Suspect Giardia and Cryptosporidium in all springs, rivers, and lakes. Could have been inundated by flood waters or contaminated by oil, chemical spills, dead animals, etc. Filter and purify.



WATER

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RADIOACTIVE WATER

Questions & Answers

By Sharon Packer

Question

Will water become radioactive after a nuclear detonation? If so, how do we find safe drinking water?

The short answer to this question is: “Water can become radioactive for a very short time, but radioactive drinking water will not be an issue”. There are, however, some very important guidelines for the consumption of food and water after a nuclear event, and the full answer requires some basic review about half-life decay and radiation contamination.

The time required for the radioactivity of a given quantity of a particular nuclide to decrease (or decay) to half of its original value is called its half-life. Each radioactive element decays at a given rate. This means that half of the total amount of the element decays during a set (or definite) half-life. Half of the remaining element decays in the next set time period, and so on. In ten half-lives the activity of the isotope will decrease to about 1/1000th of its original level. After ten half-lives, most radioactive isotopes will decay to a level that is not considered harmful.

There are four basic types of concerning radiation in a nuclear event: gamma, alpha, beta, and neutron. Neutrons (unlike gamma, alpha, and beta radiation) can activate water and other items of concern. However, neutron activation can only occur within a one mile radius of a nuclear detonation. Beyond that radius, neutrons lose the energy required to activate elements. In any event, there is very negligible activation of water caused by neutron activation. Our drinking water consists of hydrogen and oxygen. When neutrons are captured by the hydrogen nuclei in water, the product is nonradioactive (stable) deuterium, so there is no resulting activity. The activity induced in the oxygen in the water molecule can be ignored because of its short half-life (29 seconds). Therefore, our

drinking water would only be radioactive for about 5 minutes. One can only assume that anyone, finding themselves unprotected within the 1.5 mile radius of neutron activation, would be incapable of consuming activated water within the required 6-minute decay time. Weapons effects (blast, thermal radiation) within 1.5 miles of a nuclear detonation will cause trauma injuries resulting in death, unless the person is in a fully protected (including neutron protection) NBC shelter. Our bodies contain about 57% water. Without neutron shielding in our shelter, the neutron damage to our bodies would eventually be fatal in a war time scenario.

Sea water (which, of course, we should not be drinking) contains sodium chloride. The activation of sodium produces sodium-24 (half-life of 15 hours), so in 6 days it decays to only 0.1% of the original value. The chlorine activates to chlorine-38, which has a 37-minute half-life (6-hour reduction to 0.1%). Manganese in the soil can dissolve in the water but has a half-life less than sodium. Other radioactive elements, however, with various and possibly longer half-lives, can find their way into the water and must be filtered from the water before it is further purified for consumption.

Gamma shielding requires 90-degree turns and shielding of high-density mass, but neutron shielding requires slowing the ‘very fast’ neutrons with barium or iron, and then decelerating the ‘moderately fast’ neutrons with low density materials (such as water).

****As a side note, shielding in a shelter against neutrons can be achieved with at least 7 feet of dirt cover overhead, and with the tightly placed insertion of shielding materials (such as equal amounts of water containers and bags of rice) placed 7 feet into the horizontal runs of the shelter entrances. Keep the entrances to a small diameter (36” to 48”) if your shelter is in close proximity to a primary target, so that the shielding material can be quickly put into place. Gamma radiation is***

attenuated by 90% by each 90-degree turn. Neutrons, however, have very small deceleration with 90-degree turns.

Gamma radiation does not cause water to become radioactive. However, fallout from a nuclear detonation can settle to the bottom of open water containers, lakes, and slow running streams. Fallout particles emit gamma, alpha, and beta radiation, and if consumed, can cause various radioactive damages to the body.

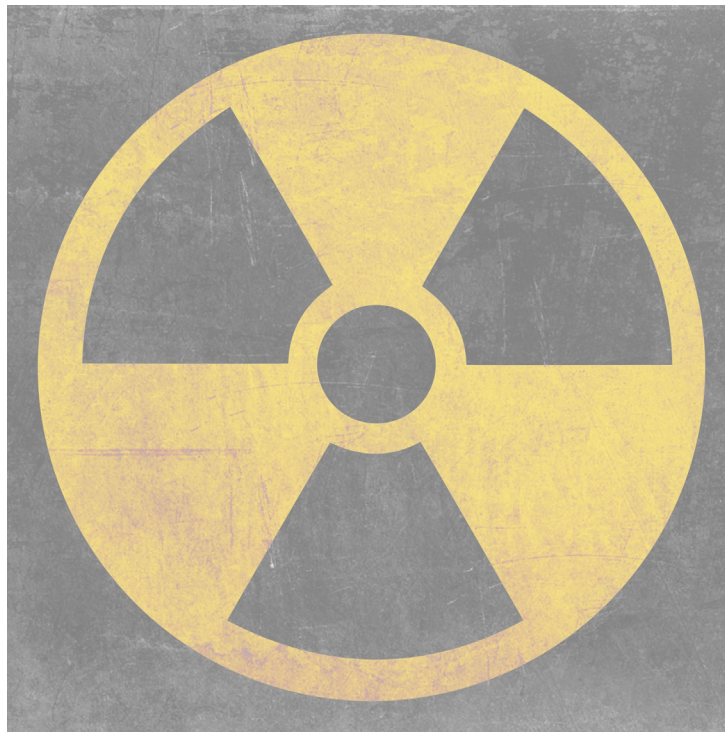
Neutron activation is the only common way that a stable material can be induced into becoming radioactive and, as noted above, areas and items within the 1.5 mile radius of the detonation may become neutron activated and should be circumvented. Huge amounts of dirt and debris are contaminated with fission products in a ground burst detonation and literally fall out of the sky onto the ground. This 'fallout' contaminates food sources and water in a widening area (depending on the height of burst, prevailing winds, and weather patterns).

Water in closed containers can be safely consumed. Fallout on top of the container will not damage the inside content. Clean the dust from the top of the container before opening the lid. If foraging for unprotected water, do not stir the bottom of the container (or lake). Fallout has mass and will settle to the bottom of the lake or container. Dip the water from the top levels without disturbing the bottom. Contaminated water must be both filtered (clarified) of debris and then purified with a good water filter or by boiling. Water sterilization by boiling is preferred over ANY method of chemical disinfection because disease-causing microorganisms cannot survive the heat from a sterilizing boil. There are very good water filters available, but this information is covered in other articles of the journal.

Clay binds to radioactive particles. If radioactive fallout has contaminated the water supplies, a simple earth filter utilizing clay type soil will effectively remove the radioactive particles from the water. This method is

better than distillation, ion-exchange filters, or charcoal filters for this purpose.

Perforate the bottom of a 5-gallon can or wastebasket with holes punched within two inches of the center. Place a two-inch layer of washed pebbles on the bottom of the can. Cover the pebbles with one thickness of terry cloth towel or other porous cloth. Scrape the top 4-5 inches of soil off the ground to get below the fallout and dig enough clay-type soil to fill the can to a depth of 8 inches, packing it tightly against the sides. Cover the soil in the can with another thickness of toweling and another one or two inches of pebbles. Suspend the can over a clean container and pour the contaminated water into the top. Clear (but unpurified) water will come out the bottom at the rate of about 6 quarts per hour.



Fallout is visible. It looks like dust. If there is no dust layer outside, there has most likely not been significant fallout. Many foods can still be eaten after being contaminated with fallout. Any food items in closed, airtight containers are safe to eat. Food in paper or cardboard containers is not safe to eat. Food with hard skins that can easily be peeled (potatoes, carrots, apples, etc.), can be peeled, washed and eaten. Foods with soft skins (strawberries, peaches, raspberries, etc.) should not be eaten if fallout contamination is suspected.

Animals that do not appear to be ill can be slaughtered and consumed. Strip the meat from the bones and discard the organs. Do not eat 'dead fall' animals that you find, as you will not know the cause of their death.

Fish can be consumed if they are not 'bottom-feeders'. Do not eat shellfish, carp, or catfish. Eggs can be consumed since radiation will accumulate in the shell, but not in the yolk and white of the egg.

Do not eat shellfish, carp, or catfish. Eggs can be consumed since radiation will accumulate in the shell, but not in the yolk and white of the egg.

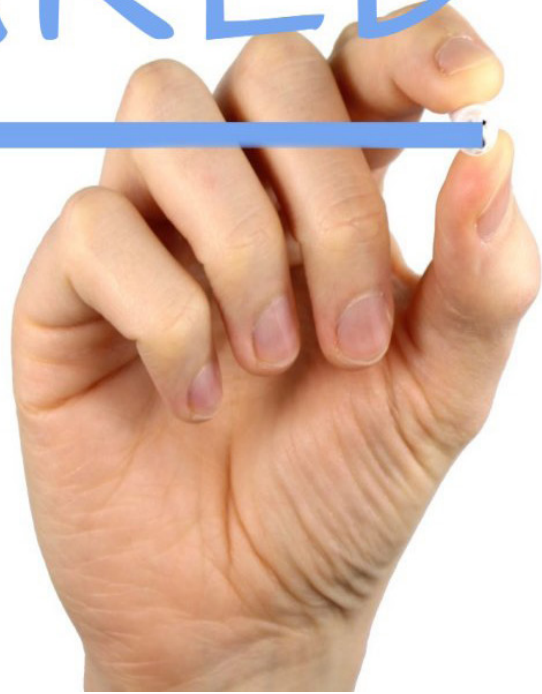
Sharon Packer has a Bachelor's degree in Mathematics with a minor in Physics, and a Master degree in Nuclear Engineering. She has served on the TACDA board of directors for over 20 years in several different capacities. Sharon is an expert in civil defense and in NBC shelter design.

PREPARED -

NESS

IN A NUTSHELL

By Bill Perkins



September was preparedness month, but it was pretty much ignored by the media. Depending on where you live, you might need to be prepared for an earthquake, winter storm, tornado, flood, fire, hurricane, even a solar flare (CME) from the sun, or a pandemic in the making. There is always good reason to prepare our families against natural disaster.

We also need to worry about what our fellow humans might do. The world seems to be less safe each year. More nations are acquiring nuclear weapons and the ability to produce and deploy an EMP device. Terrorism is a constant threat. Any one of these events could cause major disaster along with civil unrest for an extended period of time.

The likelihood of these things happening may be low. However, looking at them as a whole, and considering the severe consequences of the occurrence of any one of them, we feel it would be prudent to begin making some serious preparations.

Consider the Following List for Some Suggestions:

WATER

Water is more important than food, as you can only go about three days without water. The amount of water you need depends on how many people are in the group. You need at least one gallon per person per day. For example, four (4) people for 15 days require 60 gallons (and don't forget your pets.) The ability to filter unsafe water is very

important. A water filter like the Big Berkey with the black filters is a good choice. It is also a good idea for each person to have a "Life Straw Filter" or a portable filter for temporary use.

FOOD

Cans of food with recent dates are good for the short term (don't forget your can opener). For the longer term, companies like Mountain House make freeze dried foods in #10 cans. All you need to do is add hot water. Storage life on most of those types of products is 25 years. MREs will store for 5 to 7 years if kept in a cool dry place.



MEDICAL SUPPLIES

Good quality first aid kit. Include medications that anyone in your group may need. You may also need a medical handbook. EMT training books are available

at Jr. Colleges. “The Survival Medicine Handbook”, by Joseph Alton MD, is a good resource. Attend a Red Cross CPR/ First Aid class. A good supply of over-the-counter meds like antibiotic ointment, aspirin, Tylenol, ibuprofen, antacids, alcohol and antidiarrheal meds are just a few of the items you may need.



SANITARY SUPPLIES

Toilet paper, disinfectant, household bleach, soap, personal hygiene items, feminine products, plastic bags (assorted sizes), plastic bucket with tight lid, tooth brush and paste and baby wipes.

COMMUNICATIONS

Radio receiver AM/FM / WEATHER/ SHORTWAVE, extra batteries, and a compass and map. Ham or CB radios are also good to have and the emergency broadcast system now comes over the weather radio.

TOOL KIT

Basic hand tools plus saws, shovels, a wrecking bar, a small ax, a good hammer, two rolls duct tape, two plastic tarps, a good knife, plastic tie wraps (6”, 8” 12” and 24”), two pair of good gloves, a Para cord (550), and any special tools you may need such as tools to turn on/off gas and water.



PREPARE FOR WINTER

Wood for fire place, propane tank (filled), warm clothes and hats, proper shoes, one space blanket per person, matches, lighters, fire starters. Be sure your car has been prepared for winter.

LIGHTING

LED lanterns and flashlights, extra batteries, head lamp, rechargeable batteries, solar charger, oil lamps (extra oil/wicks).

SAFETY AND PERSONAL PROTECTION

The banks may be closed during a major disaster, so have some extra cash. You may not be able to depend on the fire or police departments. You should have a minimum of two (ABC) fire extinguishers (2A-40BC). Personal protection will vary greatly with individual homes. If you have weapons, you must know how to use them. Go to the range and practice, NOW. A good shotgun is a great weapon to start with. You could be on your own for days, weeks, or months.

IMPORTANT PAPERS

Have your important papers, birth certificates, passports, deeds etc. in a safe location and place them in a water proof plastic bag.

Many articles have been written on each of the ten headings I discussed above. Hopefully, this will help motivate you to expand your knowledge of preparedness. The American Civil Defense Association website is a great place to start. (www.TACDA.org)

What you do in the few hours before a disaster (if you have warning) and the few hours after a disaster can make the difference in survival.

90% of your chance at survival is based on your knowledge, skills, and your will to survive. 10% is based on the equipment and supplies you have gathered.

Remember, when the time of need arrives, the time to prepare has passed.

Bill Perkins has served on the TACDA Board of Directors for many years in several different capacities. He served eight years in the US Air Force. While there he attended numerous electronics and instructor schools and the University of Southern Mississippi. He was an instructor for communications/missile electronics. Major awards included: Bronze Star with 'V' Device, Air Force Commendation Medal, South Vietnamese Government's Medal of Honor. Mr. Perkins has been married to his wife Donna for 44 years. His hobbies include reading, ham radio(KD4FJL), scuba diving, target shooting and horses. He has always been interested in civil defense and recently completed the National Guard Trained Crisis Responder Course (TCR) for Terrorism and Disaster Response.

NEW! In the **Survival Store** at www.tacda.org

The **Freedom** Flashlight



\$21.95

Member price

No batteries needed! By simply shaking the flashlight, electromagnetic power is generated which lights the LED bulb. 60 seconds of shaking provides hours of light. Waterproof, lightweight, and it floats!



- Ideal for home, auto, boat, outdoor, & emergency use
- Super bright LED light
- Stands on either end
- Shock resistant
- Rubber guarded
- Waterproof
- It floats
- Just shake the flashlight to charge
- No batteries needed!
- No maintenance required

Waterproof, EMP Resistant 16GB USB Device!

\$23.99

Member price

Waterproof to 100m depths

- 16GB
- Shock Resistant
- Military grade USB drive
- EMP Resistant
- Chrome Plated Shell

A perfect gift! Comes pre-loaded with all the TACDA resource essentials.

- All Journals of Civil Defense since 1968 (That's 237 JCD to date!)
- TACDA Academy
- Nuclear Weapons Effects
- Only takes 2.5GB of space on the 16GB flash drive





ON THE CORONAVIRUS

By Jane M. Orient, M.D.

Some of the views expressed here are controversial. So, do ask your doctor. I hope you have one—not just the HMO or retail clinic “provider.”

Don't panic. That is always good advice. If you, like the world's economy, operate on just-in-time inventories, and did not take advice to stock up 3 weeks ago, do not join a mob at a big-box store. Somebody there is no doubt infected. Plus, there's the risk of getting trampled or injured in a fist fight over the last roll of toilet paper. Most of the world survives without that luxury good. If you have no rice or beans or pasta in the pantry, that is more serious, but you should still avoid mobs if at all possible. Take-out and drive-through places are booming.

If you are a member of TACDA, you should already know about the need to have food reserves for all kinds of emergencies including war, famine, epidemics, or unemployment. Many vendors offer supplies for long-term storage. The most cost-effective advice was worked out long ago at Oak Ridge National Laboratory, although unprocessed wheat, beans, and corn require preparation. If you don't have a copy of the indispensable *Nuclear War Survival Skills* by Cresson Kearny, download and print one now (www.oism.org/nwss). It is best to also order a bound and printed copy. You can purchase one in the Tacda Survival Store.

(<https://tacda.org/product-category/books-manuals/>) Water storage and purification, sanitation, improvised clothing, and many other topics are included. And all the advice is field-tested.

Don't treat fever without a doctor's advice.

Fever is not a disease. It is an important defense mechanism. Very high fevers (say 105 degrees) can cause brain damage, and children can have seizures. But don't pop Tylenol or ibuprofen at the first sign of fever. Many of the casualties in the 1918 pandemic might have been caused by heavy use of aspirin. Like aspirin, popular non-steroidal anti-inflammatories (NSAIDs) such as ibuprofen also have detrimental effects on blood clotting. Try lukewarm sponge baths for comfort.

Don't rush out and get a flu shot. I know, a lot of doctors and public health authorities urge everybody to do this. Influenza can kill you, and the flu shot decreases that risk by 30% to 60%—but there is evidence that it can make COVID-19 worse, both from the earlier SARS epidemic and lab research. Like with so many things in medicine, we have to play the odds.

Don't go to events that are crowded, especially indoors in poorly ventilated rooms. Staying home is good.



Emergency →

Don't go to the emergency room or urgent care unless you are severely ill. There will be sick people there, and you might catch something. You also might end up with a big bill, say for a CT scan you didn't really need. And if you have the flu or a cold or COVID-19, and don't need IV fluids or oxygen, they can't do anything for you. Telephone advice lines could help greatly.

Don't demand to be tested and rely on the results. The tests are still in short supply and not very accurate. If you are at low risk, a positive test is likely to be a false positive. And if you are infected, the test may be negative at first. We need much more testing—mainly for public health monitoring.

Don't waste. Expired medications are probably still good. Dependent as we are on just-in-time inventories and a single-source supply chain that starts in locked-down factories in China, we will soon run out of essential drugs. Masks (also mostly made in China) are meant to be disposable, but likely can't be replaced (see below).

Doctors for Disaster Preparedness worked out suggestions about things to store in 1987, some requiring a doctor's prescription (www.ddponline.org.htm). The most out-of-date information there is the 1987 prices—which are very instructive.

As Rosemary Gibson writes in her book "China Rx", the world is now dependent on China for 90 percent of all drugs, both prescription and over-the-counter, including penicillin and vitamin C. The federal government has until recently declined to recognize this as a national-security issue.

Don't touch your face or your eyes. That is very hard—preventing that is one function of a mask and eye protection.

Don't fall for internet scams or malware.

Hucksters will always be around to try to profit from panics. A new type of malicious virus is embedded malware in sites that come up on a search for information. (If you want to find the Johns Hopkins University dashboard of cases and deaths, go to the university's website. Don't Google "coronavirus map.")

Now For Some Do's

Do prepare to take care of yourself and your family. Be sure you have a fever thermometer, disposable gloves, plastic garbage bags, and cleaning supplies. A pulse oximeter, available in many places for around \$40, is good to have to check oxygen levels. The book "Three Seconds until Midnight" by Steven Hatfill, M.D., et al., is full of useful information, including links to free self-help medical resources, referenced in the September 2019 Doctors for Disaster Preparedness Newsletter.

<https://www.ddponline.org/2020/01/04/pandemic-preparedness/>

Do clean and disinfect surfaces such as doorknobs, telephones, computer keyboards, toilets, and countertops often. Viruses can persist there for days.

Do remember that sunlight is the best disinfectant. If you don't have a pocket ultraviolet lamp (they are or were available on amazon), try putting things like masks or paper currency out in the sun. The idea should be rigorously tested, but in times of need, you may have to guess.

Do wash your hands often and use hand sanitizer. With SARS-CoV-2, most disinfectants work, including 70-percent-alcohol-based sanitizers.

Do put a mask on sick people if you can. For protecting yourself you need a minimum of an N95 mask and eye protection.



Do take your vitamins. Most people may be vitamin D deficient. Your need for vitamin C escalates with infection. Some 50 tons of vitamin C was shipped to Wuhan, and studies of effectiveness are underway. How much should you take? Some recommend 5,000 IU of vitamin D daily, or even more—far greater than government standards. Intake of vitamin C is generally limited by diarrhea. You can tolerate much more in the lipospheric form. The government's or medical authorities' definition of "highdose" may be far less than what you need when a serious infection is increasing your body's need. One source that has been censored by Facebook is

<http://orthomolecular.org/resources/omns/v16n15.shtml>.

Do get your essential prescriptions refilled for 90 days. If your managed-care plan won't pay, consider paying cash. You may be able to get a good price with a coupon from goodrx.com.

Do protect your immune system, with adequate sleep, exercise, fresh air, and diet, especially avoiding sugar if you feel ill.

Do help your neighbors and be responsible about protecting others as well as yourself from contagion.

Resources to check for updates:

Facebook. Search for "medical news discussion," curated by the Pima County Medical Foundation. Please comment on entries and send new topics to hollygruhl@gmail.com or janeorientmd@gmail.com.



Jane M. Orient, M.D. obtained her undergraduate degrees in chemistry and mathematics from the University of Arizona in Tucson, and her M.D. from Columbia University College of Physicians and Surgeons in 1974. She completed an internal medicine residency at Parkland Memorial Hospital and University of Arizona Affiliated Hospitals and then became an Instructor at the University of Arizona

College of Medicine and a staff physician at the Tucson Veterans Administration Hospital. She has been in solo private practice since 1981 and has served as Executive Director of the Association of American Physicians and Surgeons (AAPS) since 1989. She is currently president of Doctors for Disaster Preparedness. She is the author of "YOUR Doctor Is Not In", "Healthy Skepticism about National Healthcare", and the second through fifth editions of "Sapira's Art and Science of Bedside Diagnosis" published by Wolters Kluwer. She authored books for schoolchildren: "Professor Klugimkopf's Old-Fashioned English Grammar" and "Professor Klugimkopf's Spelling Method", published by Robinson Books, and coauthored two novels published as Kindle books: "Neomorts" and "Moonshine". More than 100 of her papers have been published in the scientific and popular literature on a variety of subjects including risk assessment, natural and technological hazards and non-hazards, and medical economics and ethics. She is the editor of AAPS News, the Doctors for Disaster Preparedness Newsletter, and Civil Defense Perspectives, and is the managing editor of the Journal of American Physicians and Surgeons.

"YOUR Doctor Is Not In": Healthy Skepticism about National Healthcare <https://www.amazon.com/Your-Doctor-Not-Skepticism-National/dp/0517590115>

"Sapira's Art and Science of Bedside Diagnosis" https://www.goodreads.com/book/show/2543438.Sapira_s_Art_and_Science_of_Bedside_Diagnosis

"Professor Klugimkopf's Old-Fashioned English Grammar" and "Professor Klugimkopf's Spelling Method" <https://www.robinsonbooks.com/products/professor-klugimkopfs-old-fashioned-english-grammar>

AAPS News <https://aapsonline.org/>

Doctors for Disaster Preparedness Newsletter <https://www.ddponline.org/>

Journal of American Physicians and Surgeons. <https://www.jpands.org/>



CORONAVIRUS

Protective Measures

By the World Health Organization (WHO)

The World Health Organization (WHO) has suggested these basic protective measures against the new coronavirus

Stay aware of the latest information on the COVID-19 outbreak, available on the WHO website and through your national and local public health authority. Most people who become infected experience mild illness and recover, but it can be more severe for others. Take care of your health and protect others by doing the following:

Wash your hands frequently

Regularly and thoroughly clean your hands with an alcohol-based hand rub or wash them with soap and water.

Why? Washing your hands with soap and water or using alcohol-based hand rub kills viruses that may be on your hands.

Maintain social distancing

Maintain at least 2 meters (6 feet) distance between yourself and anyone who is coughing or sneezing.

Why? When someone coughs or sneezes, they spray small liquid droplets from their nose or mouth which may contain virus. If you are too close, you can breathe in the droplets, including the COVID-19 virus if the person coughing has the disease.

Avoid touching eyes, nose and mouth

Why? Hands touch many surfaces and can pick up viruses. Once contaminated, hands can transfer the virus to your eyes, nose or mouth. From there, the virus can enter your body and can make you sick.

Practice respiratory hygiene

Make sure you, and the people around you, follow good respiratory hygiene. This means covering your mouth and nose with your bent elbow or tissue when you cough or sneeze. Then dispose of the used tissue immediately.

Why? Droplets spread virus. By following good respiratory hygiene you protect the people around you from viruses such as cold, flu and COVID-19.

If you have fever, cough and difficulty breathing, seek medical care early

Stay home if you feel unwell. If you have a fever, cough and difficulty breathing, seek medical attention and call in advance. Follow the directions of your local health authority.

Why? National and local authorities will have the most up to date information on the situation in your area. Calling in advance will allow your health care provider to quickly direct you to the right health facility. This will also protect you and help prevent spread of viruses and other infections.

Stay informed and follow advice given by your healthcare provider

Stay informed on the latest developments about COVID-19. Follow advice given by your healthcare provider, your national and local public health authority or your employer on how to protect yourself and others from COVID-19.

Why? National and local authorities will have the most up to date information on whether COVID-19 is spreading in your area. They are best placed to advise on what people in your area should be doing to protect themselves from the spread of viruses and other infections.

Protection measures for persons who are in or have recently visited (past 14 days) areas where COVID-19 is spreading

- Stay at home if you begin to feel unwell, even with mild symptoms such as headache and slight runny nose, until you recover. Why? Avoiding contact with others and visits to medical facilities will allow these facilities to operate more effectively and help protect you and others from possible COVID-19 and other viruses.
- If you develop fever, cough and difficulty breathing, seek medical advice promptly as this may be due to a respiratory infection or other serious condition. Call in advance and tell your provider of any recent travel or contact with travelers. Why? Calling in advance will allow your health care provider to quickly direct you to the right health facility. This will also help to prevent possible spread of COVID-19 and other viruses.

Protect yourself and others from getting sick

This advice from the WHO was taken from www.who.int. For this and other information on the novel coronavirus see www.who.int/emergencies/diseases/novel-coronavirus-2019/advice-for-public

Wash your hands

Wash your hands with soap and running water when **hands are visibly dirty**



If your **hands are not visibly dirty**, frequently clean them by using alcohol-based hand rub or soap and water



World Health Organization

Protect yourself and others from getting sick

Wash your hands

- after coughing or sneezing
- when caring for the sick
- before, during and after you prepare food
- before eating
- after toilet use
- when hands are visibly dirty
- after handling animals or animal waste



World Health Organization

Protect others from getting sick

When coughing and sneezing **cover mouth and nose** with flexed elbow or tissue



Throw tissue into closed bin immediately after use



Clean hands with alcohol-based hand rub or soap and water after coughing or sneezing and when caring for the sick



World Health Organization

Protect others from getting sick

Avoid close contact when you are experiencing cough and fever




Avoid spitting in public



If you have fever, cough and difficulty breathing **seek medical care early** and share previous travel history with your health care provider



World Health Organization



Vector and Zoonotic Borne Disease

By Colonel Jim Smith

Vector borne diseases are defined as diseases transmitted by contact with an insect.

Zoonotic diseases are transmitted via animals. Parasites, viruses, and bacteria, for example, can all be transmitted by mosquitoes, ticks, lice, or various animals. In many instances, the animal may be infected, bitten by a mosquito perhaps, then bite a human where transmission occurs. Disease reservoirs, particularly in warm climates, provide sources for insects and animals to acquire the disease.

Zoonotic diseases, including the novel corona virus 2019 (COVID19), are worthy of attention. Although the crude mortality rate reported from 2% to 6% for COVID19 (varying sources reporting) is much higher than the seasonal influenza, it appears, according to the Centers for Disease Control and Prevention, to affect more seriously those older (note several fatalities have occurred in nursing homes) and those with existing comorbid diseases. Those without these factors seem to survive COVID19 with varying degrees of illness ranging from mild to moderate results.

Many of the corona viruses are zoonotic such as SARS and MERS. The concern with COVID19 is that it appears to transmit easily in humans, presumptively through droplets from coughs, sneezes, and potentially from fomites on environment surfaces. The primary concern is the higher mortality rate, ease of human to human transmission, concern for rapid spread overwhelming health-care resources, and adverse economic effects. The use of standard protective measures such as social isolation, covering coughs/sneezes, N99/95 respirator use, nitrile glove use, frequent handwashing, avoiding facial

touching, and keeping environmental surfaces clean, will reduce the spread according to many healthcare authorities.

One concern, however, is that the virus may mutate into a more virulent form. This emerging disease demonstrates how preparations are lacking within the global community to combat, contain, and control emerging viral diseases.

Some of the issues with vector borne diseases within the United States include mosquito borne viral illnesses such as zika, West Nile virus, Eastern Equine Encephalitis, dengue, Chagas, chikungunya, and others. Ticks who carry rickettsia transmit Rocky Mountain spotted fever and viral diseases. Contact with fleas can result in the transmission of typhus and plague if the flea has bitten an infected animal such as a ground squirrel, flying squirrel, or opossum. Plague is an endemic disease in some areas of the southwestern US.

In recent years, the threat from vector borne diseases has increased. According to the Center for Disease Control (CDC), disease cases from mosquito, tick, and flea bites tripled in the US from 2004 to 2016. Nine new germs spread by mosquitoes and ticks have been discovered or introduced since 2004. According to the CDC, in the US about 80% of the organizations responsible for vector disease control lack the ability to perform their mission. The CDC says between 2004 and 2016 more than 640,000 cases involving vector borne diseases were reported with likely many more unreported.

With this rapid increase in the number of diseases transmitted by vectors such as fleas, ticks, and mosquitoes, the need to prevent exposure and remove conditions conducive to reproduction of the disease-bearing vectors or disease pools is essential. Removal of mosquito breeding sites such as standing water or insecticide countermeasures to prevent reproduction is recommended. The same is true with fleas and ticks. Removal of breeding sites for rodents is another recommendation. Avoidance of contact with rodents is also recommended. Commercial pest control companies market effective countermeasures for mosquitos, fleas, and ticks in residential settings. The CDC recommends that a repellent containing 30% DEET, permethrin for clothing, or another rated insect



repellent be used when exposed to these insects. Long sleeve shirts and pant legs tucked into boots or socks is also recommended. Where flying insects and ticks are a substantial hazard, consider mosquito suits with gloves, a hat, and a face net. When exposed to ticks, a full body inspection immediately following is recommended with care paid to hair. Combing through body hair with a comb may help identify ticks.

A recent case in Alabama identified a child with no known exposure to ticks who experienced the classical signs of the rare tick paralysis syndrome with numbness and tingling in the limbs/face with ascending paralysis. An astute emergency physician noted the signs and symptoms and did a thorough combing of the hair of the child and located a tick “seized” to the child. Removal of the tick saw rapid clinical improvement. The CDC recommends fine tweezers placed as close to the skin as possible at the attachment point be used to remove the tick. Washing with soap and water at the site is

recommended. If any concerns regarding tick removal are present, seek professional medical assistance. Tick paralysis syndrome can be difficult to differentiate from Guillain-Barré, so a history of tick exposure is critical to the differential diagnosis. This same syndrome can be seen in canines and other animals. Pregnant women or those women who may become pregnant should take reasonable steps to prevent any contact with mosquitos regardless of the presence of zika virus in the area.

The key to prevention is to know what disease entities are prevalent in the region. Although many of the diseases are seen nationwide, many areas in the Western US see a totally different range of diseases than those in the Eastern US. Another issue is that most of the diseases present with fever, malaise, rash, and sometimes



GI upset. They mimic influenza and present as a “flu-like illness.” Therefore, a history of exposure to fleas, ticks, and mosquitos can help provide the physician a basis for inclusion of zoonotic or vector borne diseases in the differential diagnosis. Any travel outside the US should also be mentioned as many diseases not common to the US are present in other countries.

Becoming familiar with the types of diseases, the common vectors and zoonotics, and signs/symptoms for the disease entities of the region in which one lives is important. Some vaccines exist, but the better alternative is to limit exposure and use exposure prevention methods. If a flu-like illness is experienced (especially outside of influenza season), seek prompt medical attention. Early treatment of influenza or vector borne diseases is important as some of the diseases, unless treated quickly, have serious sequela which may not appear for months.

See these websites for more information.

Center for Disease vector borne disease:

<https://www.cdc.gov/ncezid/dvbd/about.html>

World Health Organization vector borne disease:

<https://www.who.int/test/hm/vector-borne/>

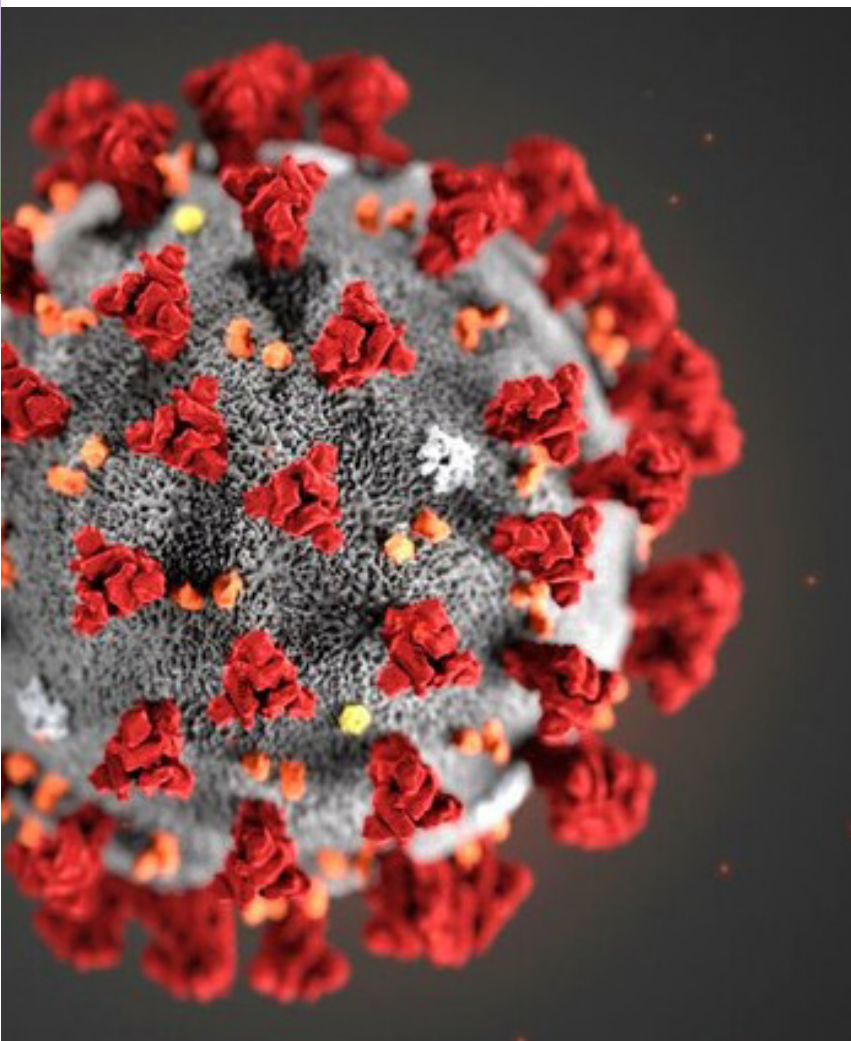
World Health Organization coronavirus:

<https://www.who.int/emergencies/diseases/novel-coronavirus-2019>

National Institute of Health website

<https://www.nih.gov/>

Colonel Jim Smith has more than 40 years of public safety experience with a master's degree in safety from the University of Southern California. He is the public safety director for a rural Alabama community. Smith teaches terrorism, emergency management, and counter terrorism classes for the University of Phoenix and Troy University. Smith has published five textbooks regarding WMD, emergency management, crisis management, and tactical medicine.



EDITOR'S LETTER, *Continued*

FROM THE EDITOR

Why Civil Defense?

*by Roseanne Hassett
Executive Director*

the necessary items they need to survive. What better assurance can you have than knowing that you are prepared? Civil defense is an action in emergencies and disasters that is undertaken by civilians. This means YOU. The mission of the American Civil Defense Association is to provide education, products, and resources that empower American Citizens to be prepared in the event of emergencies and disasters. We hope that you will take advantage of the information and resources that we provide on our website at www.tacda.org and in the Journal of Civil Defense and prepare!

As Benjamin Franklin wisely stated... we concur; "By failing to prepare, you are preparing to fail."



SOLAR ENERGY in the U.S.

By Daniel Powell



When Bell Laboratories announced they had produced a silicon solar cell boasting 6% efficiency in 1954, *The New York Times* heralded the milestone as “the beginning of a new era,” where mankind would finally harness “the almost limitless energy of the sun.” It wasn’t the first time anyone had tried; the first solar panels were installed on a New York City rooftop some 70 years prior, but it was the first time anyone had created something reasonably efficient out of inexpensive, earth-abundant materials (earth’s crust is approximately 28% silicon). The landmark stood at the forefront of more than 100 years of photovoltaic (PV) research, and those who marveled at the accomplishment were certain that solar technology would proliferate unencumbered. By 1979, President Carter had ordered the installation of 32 panels at the White House. During the dedication ceremony, he mused, “a generation from now, this solar heater can either be a curiosity, a museum piece, an example of a road not taken, or it can be just a small part of one of the greatest and most exciting adventures ever undertaken by the American people.” The panels were removed three years later.

Today, solar accounts for less than 1% of total US energy consumption despite drastic improvements in cell efficiencies. The highest solar cell efficiency, a measure of its ability to convert raw sunlight into usable electrical energy, achieved in a laboratory setting is just over 47%, and rooftop solar panels, made from arrays of individual cells, commonly range anywhere from 15-22% for the entire array. Additionally, solar technology costs over 100 times less per watt today than it did in the 1960s, and even garners tax-break incentives for new adopters through both state and federal subsidies. A road not yet taken indeed, but why has solar adoption proceeded at such a slow pace in the US?

In terms of the power grid, coal has been and continues to be the mainstay of electricity generation in the United States. Despite a steady decline since its peak in 2007, cheap and available coal still comprises roughly 32% of the electric power sector. Natural gas and nuclear power compete for second place at about 29% and 22% respectively, with wind and hydroelectric producing 7% each. Today, only about 1.6% of electricity is produced by solar, and the remainder is generated from small amounts of petroleum, geothermal, and biomass

sources. It's a relatively small fraction that has been steadily growing throughout the years and has been helped along the way by government subsidy. Without these subsidies, PV might not have gained much traction beyond wealthy adopters due to the large price disparity in favor of fossil fuels in those early days. The uphill battle to compete with mature technologies has only recently begun to equalize as global PV production has accelerated.

In 1936 Theodore Wright found an empirical relationship between airplane manufacturing and production efficiency, noting that costs decreased by roughly 20% every time manufacturing output doubled. This phenomenon came to be known as the Learning Curve, and some variant of it generally holds for most industries. Essentially, as a company makes more products, they learn how to make them more efficiently. In the case of electrical utilities, the costs associated with a given fuel source change relative to its installed capacity. As the coal-fired power plant proliferated in the 20th century, for example, it slowly became a more cost-effective means of producing electricity. Interestingly, coal has seen an average 8.3% reduction in cost for every doubling of installed capacity, natural gas an average 14%, wind 12%, hydroelectric 1.4%, and biomass 11%. Solar, meanwhile, has seen the most drastic improvement with a 23% average cost reduction per doubling. But the periods between doublings are vastly different for each technology, and for good reason.

The US government actively subsidized research and development of energy-related technologies following WWII as a means of stimulating economic growth, spending hundreds of billions in modern dollars on incentives for energy production aimed primarily at fossil and nuclear power. It wasn't until the energy crisis of the early 1970s and formal creation of the US Department of Energy (DOE) under the Carter administration that a significant portion of the budget was allocated to renewables (1978), but Americans kept our misgivings. In the subsequent 40 years, fossil fuels still received \$10 billion more in subsidies than renewables and nuclear received \$30 billion more. All in all, just 12.8% of US energy funding went to renewables in the years following WWII, while fossil and nuclear energies received 24% and 47.8% of the funding respectively. Moreover, solar was only allocated a fraction of the total renewable's budget. By the time solar panels had reached the market, fossil fuels had largely experienced their growing pains. From 1902 to 1970, the cost to produce electricity with coal had dropped by nearly 90%. The price disparity necessitated expansion into more niche markets which were slowly filled but remained cost-prohibitive for widespread use in the US. Today, all of that is beginning to change as China leads the march in solar panel production.





Gregory Wilson, director of the DOE's National Center for Photovoltaics at NREL, noted that

"PV is quickly positioning itself to be a really big player in the world... We argue so much about the silly politics of climate change and fail to recognize the gargantuan economic opportunity that this presents."

The energy system is going to get re-engineered... The Chinese seem to have recognized the significance of this opportunity." Indeed, the Chinese government is dumping billions of dollars into its solar programs, and American companies have suffered due to unanticipated price drops. Several companies have gone bankrupt in the last decade while others' stock prices have plummeted. In the 1990s the US led the world in panel production, but today China produces over 70% of the world's panels while less than 2% are manufactured in the US.

Increased dependence on foreign PV production in the coming decades is troublesome. Renewables are the fastest-growing energy utility in the US and are predicted to supplant fossil fuels as the dominant energy resource.

More than 100 US cities have committed to building an entirely renewable energy economy by 2050, with more likely to join their ranks in the near future. Additionally, since solar panels don't last forever, those installed in the future will eventually have to be replaced. If China succeeds in monopolizing what they call a "strategic industry," (PV manufacturing), then expansion of solar PV in the United States will coincide with economic sensitivity to tremors in Chinese markets, and déjà vu with our long history of dependence on foreign oil. Mitigation is still within reach for the US but will require a drastically different subsidy strategy to rival that of China.

The upside is that solar prices in the US have fallen drastically in just the last few years, making them much more affordable for everyday consumers to put on their roofs. Some even predict solar installation costs to drop below maintenance and operational expenses of some existing power plants causing a utility-scale shift beyond individual consumers. But there is a case to be made for home installation over utility solar. For one thing, rooftop solar panels are not sensitive to widespread power outages and offer self-sufficiency from the electric grid. Owners can become experts at maintaining and repairing their

systems in the event of a national crisis. Additionally, many states allow users to sell their surplus back to the power grid which contributes to a more efficient and widely distributed system.

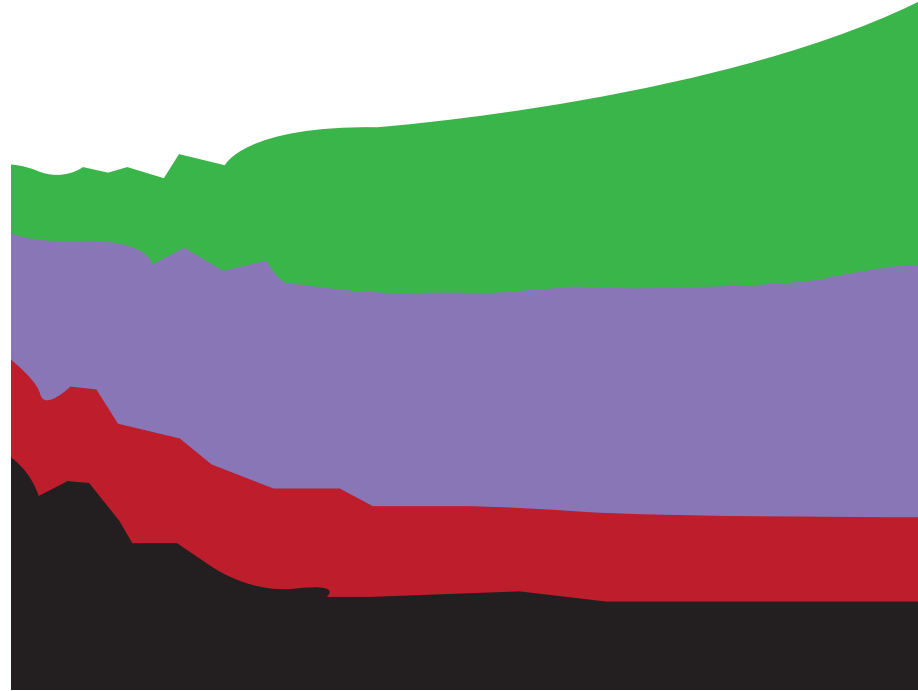
Still, technological hurdles must be overcome before solar can be fully integrated into the US electric grid. Stated bluntly, it wasn't built to accommodate solar. The grid design is based on a flow-in-flow-out principle wherein supply must match instantaneous demand. Energy must therefore be consumed right away and is never stored, but the sun only shines during the day, and while it shines complex weather patterns variably arise across different landscapes presenting a major engineering challenge for connected systems. Many have noted that reengineering the electric grid to accommodate solar is one of the most complex engineering problems in the modern world, but the challenges are not insurmountable. As the industry grows, more effort will be allocated to solving these problems. Promising new PV technologies and applications are emerging that stand to move technological advancement forward; solar windows and paints, self-sufficient greenhouses, perovskite materials that cost pennies on the dollar, and solar vehicles.

Perhaps in the face of climate change, our social, political, and economic resolve will overcome the many barriers that must be crossed. It would seem that general public sentiment toward renewable energy is at least as hopeful today, albeit more practical, as it was in years past. Optimism for a sustainable future is shared by many public figures and advocates whose language often portends that technology is just a few years from widespread adoption. As always, the new age of solar dominance is just on the horizon. The author remains skeptically hopeful; we have heard this type of language before.

Daniel Powell is a PhD candidate in the Department of Chemistry at the University of Utah. His work in the Whittaker-Brooks research group aims to develop and improve renewable energy harvesting technologies. Specifically, his research focuses on creating new strategies of electron doping in organic semiconductors, which may have applications in solar energy, thermoelectricity, batteries, computing, and electronics.



THE U.S. ANNUAL ENERGY OUTLOOK



By Dr. Gary Sandquist PhD, MBA, PE, SE, CHP, CQA

The Annual Energy Outlook (AEO) with projections from 2020 to 2050 (January 2019), U.S. Energy Information Administration, Office of Energy Analysis, U.S. Department of Energy Washington, DC. is given on the Web at: www.eia.gov/aeo. The AEO is developed using the National Energy Modeling System (NEMS), an integrated model that captures interactions of economic changes and energy supply, demand, and prices. Energy market projections are subject to much uncertainty because many of the events that shape energy markets as well as future developments in technologies, demographics, and resources cannot be foreseen with certainty. However, the AEO is published to satisfy the Department of Energy Organization Act of 1977, which requires the Administrator of the U.S. Energy Information Administration to prepare annual reports on trends and projections for energy use and supply. The AEO2019 Reference case represents EIA's best assessment of how U.S. and world energy markets will operate through 2020 to 2050, based on many key assumptions. The Reference case projection assumes improvement in known energy production, delivery, and consumption technology trends.

The economic and demographic trends reflected in the Reference case reflect current views of leading economic forecasters and demographers. The Reference case generally assumes that current laws and regulations that affect the energy sector, including laws that have end dates,

are unchanged throughout the projection period. This assumption is important because it permits EIA to use the reference case as a benchmark to compare policy-based modeling.

The Reference case should be interpreted as a reasonable baseline case that can be compared with the cases that include alternative assumptions.

Annual Energy Outlook assumptions follow:

The United States becomes a net energy exporter in 2020 and remains so throughout the projection period as a result of large increases in crude oil, natural gas, and natural gas plant liquids (NGPL) production coupled with slow growth in U.S. energy consumption. The fossil fuels, natural gas and NGPLs have the highest production growth, and NGPLs account for almost one-third of cumulative U.S. liquids production during the projection period. Natural gas prices remain comparatively low during the projection period compared with historical prices, leading to increased use of this fuel across end-use sectors and increased liquefied natural gas exports. The power sector experiences a notable shift in fuels used to generate electricity, driven in part by historically low natural gas prices. Increased natural gas-fired electricity generation; larger shares of intermittent renewables; and additional retirements of less economic existing coal and nuclear plants occur during

the projection period. Increasing energy efficiency across end-use sectors keeps U.S. energy consumption relatively flat, even as the U.S. economy continues to expand.

Key takeaways from the Reference case:

The United States becomes a net energy exporter after 2020 in the Reference case. The United States has been a net energy importer since 1953, but continued growth in petroleum and natural gas exports results in the United States becoming a net energy exporter by 2020 in all cases.

In the Reference case, the United States becomes a net exporter of petroleum liquids after 2020 as U.S. crude oil production increases and domestic consumption of petroleum products decreases. Near the end of the projection period, the United States returns to being a net

importer of petroleum and other liquids on an energy basis as a result of increasing domestic gasoline consumption and falling domestic crude oil production in those years.

The United States became a net natural gas exporter on an annual basis in 2017 and continued to export more natural gas than it imported in 2018. In the Reference case, U.S. natural gas trade will be increasingly dominated by LNG exports to more distant destinations. This currently includes shipments by pipeline from and to Canada and to Mexico as well as exports of liquefied natural gas (LNG). The United States continues to be a net exporter of coal (including coal coke) through 2050 in the Reference case, but coal exports are not expected to increase because of competition from other global suppliers closer to major world markets.

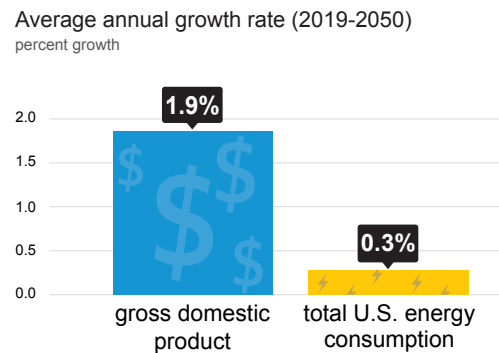
Dr. Gary Sandquist is a current member of the board for the American Civil Defense Association. He is also the Former Director of the Nuclear Engineering Program for the University of Utah and Professor of Mechanical Engineering. He has 659 publications & presentations in nuclear science, engineering, health physics, and environmental sciences including: 5 Books and Book chapters; 184 refereed Journal, Proceedings, Conference, and Transactions Articles; 145 Technical Papers orally presented at Technical, Scientific, and Government Meetings; and 325 Technical Reports for Academic, Industrial and Government Agencies. He has developed 17 major Technical Computer Codes used in industry and by government agencies, and has participated in 192 Technical Meetings, Conferences, Workshops, Seminars, and Government Hearings.



AEO2020 Reference case

U.S. energy consumption grows at a slower rate than gross domestic product through 2050 as U.S. energy efficiency continues to increase.

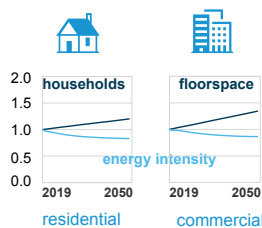
U.S. Energy Information Administration



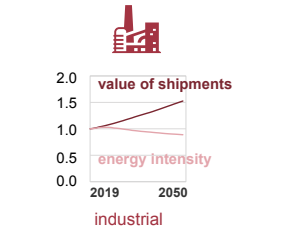
U.S. energy intensity continues its long-term decline through 2050.

Indexed end-use demand drivers and energy intensities by sector (2019–2050)

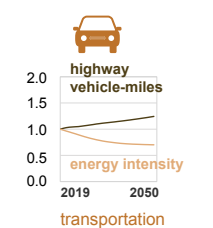
index (2019=1.0)



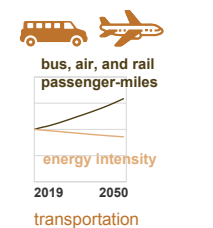
Residential and commercial sector energy efficiency improvements, increases in distributed generation, and regional population shifts partially offset the effects of higher growth rates in population, number of households, and commercial floorspace.



Energy intensity declines in the **industrial** sector as a result of increased energy efficiency of new capital equipment and the higher growth rate in non-energy-intensive manufacturing industries relative to energy-intensive manufacturing industries.



Energy use in the **transportation** sector per passenger-mile of travel in vehicles declines as newer, more fuel-efficient vehicles enter the market.



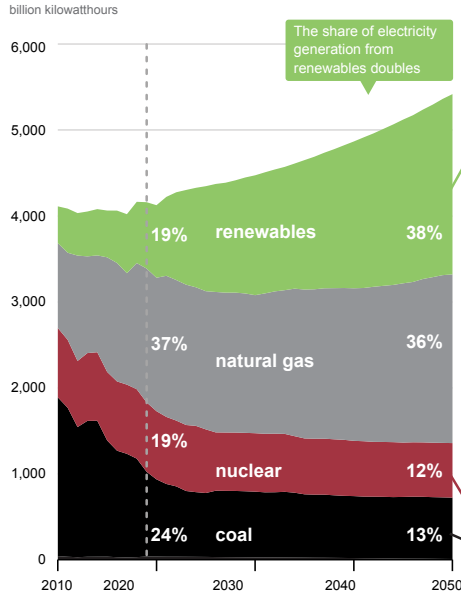
In the **transportation** sector, adoption of energy-efficient technology and practices results in decreasing energy use per passenger-mile for rail, bus, and air travel.

U.S. Energy Information Administration

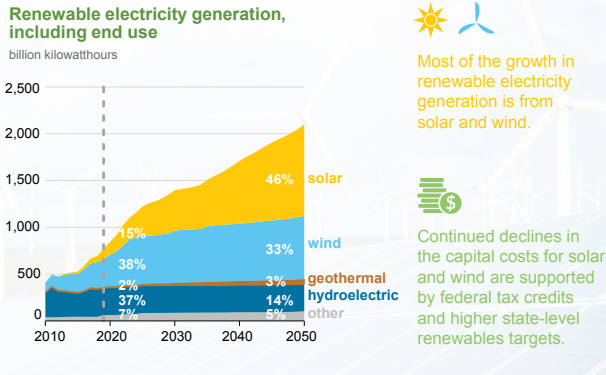


AEO2020 Reference case

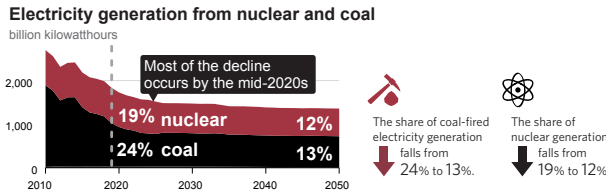
Electricity generation from selected fuels



U.S. renewable electricity generation is the fastest-growing electricity resource throughout the projection period.

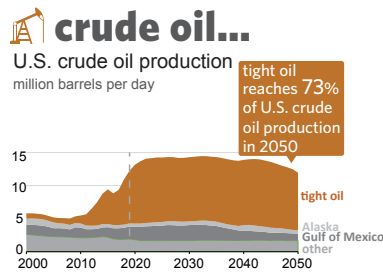


U.S. coal-fired and nuclear electricity generation declines



AEO2020 Reference case

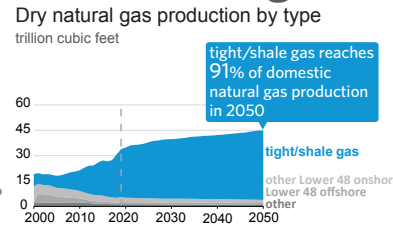
The United States continues to produce historically high levels of...



Tight oil development continues to be the main driver of total U.S. crude oil production.

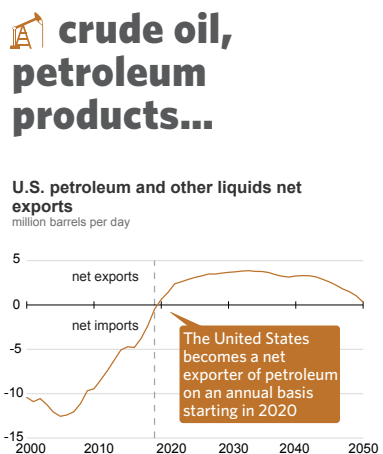
U.S. Energy Information Administration

and natural gas.

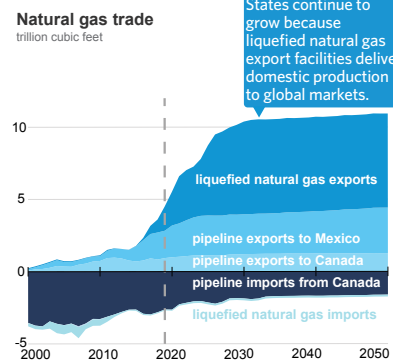


Development of tight and shale resources continues to be the main driver of U.S. dry natural gas production.

Slower growth in domestic consumption of these fuels leads to increasing exports of...



and liquefied natural gas.



COOKING WITH CHARCOAL

For Fun & Survival

By Jay Whimpey, PE

Charcoal cooking was formerly very popular before the advent of propane grills and cook tops. It is still the standard for those cooking with Dutch ovens. Many people still use charcoal due to the distinct flavor it gives to meats. Some businesses advertise that they cook with charcoal to produce better tasting food.

Everyone should perhaps take another look at charcoal cooking for their emergency backup cooking method because it is relatively inexpensive, safe, and simple. Charcoal itself is still widely available at very modest prices, especially if you buy it at the end of the summer outdoor cooking season. If you look for some no-name brands with larger packaging the pricing can be less than \$0.10 per pound. That compares very favorably with propane at over \$0.50 per pound (not including the cost of the expensive pressure cylinder). One also needs less charcoal than propane to cook the same amount of meat.

Charcoal cooking equipment is very simple and inexpensive as well. A small portable cooker (see picture) can be purchased for roughly \$10.00. There are some charcoal cookers called “Scotch Boxes” that look very much like a small metal tool box with a lip at the top to support a grill. The Scotch Box does not have adjustable vents in the bottom, side, and top like the small cooker, but it is

still very functional. To use it, you load it up with enough charcoal to cook several meals. Just open the lid, light the charcoal, and leave the lid open while you cook. When finished, the lid is closed and the burning ceases, leaving the rest of the unburned charcoal ready for the next time you want to cook.

Starting the charcoal is not as easy as with propane, but with a little bit of charcoal lighter fluid, you can cover the top surface of the charcoal in the cooker with the fluid, light it, and wait about 10 minutes. The lighter fluid will burn away and leave the charcoal burning. With a little bit of practice, you will get a feel for how much lighter fluid to use and how long to wait before cooking.

It should be mentioned that putting lighter fluid on hot charcoal can create an explosive vapor cloud. But it is not any more dangerous than propane in this respect because



you can build a cloud of propane if you let it run too long before lighting it. Charcoal also tends to produce much more carbon monoxide than propane, so it should always be used outdoors with plenty of ventilation.



Using a charcoal grill in a garage with an open door can actually build up enough carbon monoxide (CO) to be harmful for people in the house and garage. The fact that you are not dealing with a pressurized container of very volatile fuel, regulators, hoses, and valves can be an advantageous in many situations. The fact that the fuel is cheaper and easier to store with very little hazard is also advantageous. It should be pointed out that the charcoal absorbs oxygen when it gets wet and can create an oxygen deficiency in an enclosed area.

Charcoal definitely burns slower and does not burn as hot as propane. This can be an advantage if you do not want to burn your food, but it will take longer to

do the cooking. Boiling water with charcoal is almost impossible because you just cannot get the charcoal burning fast enough without providing active air flow to the charcoal.

Charcoal can burn with virtually no smoke even including the lighting process with moderate amounts of lighter fluid. This makes it very good for low observability in an emergency situation.

The modest cost of equipment and fuel, the simple and safe process, and the efficiency and smokeless operation of small charcoal cookers make them an ideal option for acquiring an emergency cooking capability with very little investment in time and money.

Jay Whimpey is the president of The American Civil Defense Association and the president of The Civil Defense Volunteers of Utah. He is a licensed chemical engineer with a vast amount of knowledge and experience in civil defense, developing new techniques and teaching preparedness skills.





Charcoal Grilled Steak & Vegetable Shish-Kabobs

Steak

2, 12 oz boneless rib-eye or New York strip steaks
 1-2 cloves minced garlic
 2 tbsp brown sugar
 3 tbsp low sodium soy sauce
 3 tbsp Worcestershire sauce
 3 tbsp honey
 1 tbsp ketchup
 ½ tsp ground ginger
 ¼ tsp ground cinnamon
 1 tsp onion powder

Vegetable Shish-Kabobs

1 zucchini
 1 red onion
 8 white button or cremini mushrooms
 1 yellow pepper
 1 orange pepper
 2 cobs corn
 1 cup cherry tomatoes

Herb Drizzle

¼ cup olive oil
 ½ tsp basil
 ½ tsp oregano
 ½ tsp garlic powder
 2 tbsp fresh squeezed lemon
 ½ tsp salt

Steak Directions

1. Mix all ingredients in a bowl to make a marinade. Reserve half of the mixture and set aside. Add the steak to the marinade and refrigerate 4 to 8 hours or overnight. Refrigerate reserved marinade.
2. Preheat an outdoor charcoal grill to high heat, (you should be able to hold your hand over the heat for only 1-2 seconds). Clean the grate and oil.
3. Remove the steak from the marinade and let rest for 20 minutes. Discard the marinade. Add steak to the grill and baste with previously reserved marinade. Grill 3-5 minutes each side for medium rare (135 degrees), 5-7 for medium (145 degrees), or 8-10 for medium well (150 degrees).
4. Heat remaining marinade in saucepan over medium heat until mixture comes to a boil then reduce to simmer. Marinade will thicken in about 5 minutes. Serve with steak.

Vegetable Shish-Kabobs Directions

1. Soak wooden skewers in water for 10-15 minutes to keep them from burning on the grill.
2. Cut vegetables into 1-inch chunks, and corn into 2-inch chunks and thread onto wooden skewers. While alternating the vegetables is a colorful display, it is best to put the same vegetables on one skewer as different vegetables have different cooking times.
3. Mix herbs, lemon and olive oil together and brush on vegetables. Repeat after turning.
4. Grill for 5-7 minutes each side or until tender on medium heat (you should be able to hold your hand over the heat for 5-7 seconds).



A Volunteer's Hard Lesson

**By Gail Ralston,
Member Contributor**

Several years ago, I joined the local chapter of the Greater River Valley Medical Reserve Corps, based out of Andover, Massachusetts. One of several MRCs throughout New England, the group identifies, educates and trains volunteers – both professional and not – to effectively respond and provide aid to areas whenever and wherever disaster strikes. The MRCs are also an offshoot of Civil Defense preparedness training, teaching citizens the importance of “planning ahead.”

As a non-medical volunteer, I have learned how to organize and set up shelters during disasters. Workshop titles included “Emergency Dispensing Sites,” “Stop the Bleed,” “Basic First Aid,” “Infectious Disease Threats and Reducing Fear,” “Natural Hazard Mitigation,” and “Preparing for the Unexpected.”

Another important part of training was learning not only to address the physical needs of disaster victims but also their emotional needs – called Psychological First Aid. While I found this aspect so important, I always wondered how effective I would be – would I be an asset to those whose lives had been horribly disrupted, would I remain calm myself, would I say the right thing and create a comforting environment for those in need?

I recently found out that the hardest – but most effective – lesson I learned was when disaster struck in my own backyard. On September 13, 2018, the communities of Andover, North Andover and Lawrence, Massachusetts were rocked by a gas crisis.

On a late Friday afternoon, I was with my grandson, Jack, who lives in the downtown area of Andover. My phone rang a town-generated “Red Alert” emergency, saying everyone had to get out of their homes – now!

Was this real? Why? What was going on? Slowly, people in homes and businesses emerged, not knowing exactly what to do. The sound of sirens seemed to be everywhere, and we were in the middle of the crisis. Emergency vehicles dashed up and down the street. Helicopters appeared overhead, hovering. The smell of smoke was in the air. I heard people wondering if we were being attacked!

For all my training, I must admit at first I was scared and unsure what to do. Gradually, information came through saying that explosions had occurred in over-pressurized gas pipes, causing random fires in homes throughout the three towns. There were no assurances where a fire could start.



Officials would not let people go back into their homes; all had to find temporary shelter. People outside of those communities were blocked from driving in – even if you were a resident. At one point, as many as 18 fires were burning at once, and Andover officials struck a maximum 10-alarm response.

While I volunteered through the MRC to help out at the hastily-opened shelters, I wasn't called. In a way, it was comforting to me, as I knew that others with no where else to go were being taken care of. I could concentrate on helping my own family and friends. I believe my Civil Defense training and education helped get me through my own situation.

It would be days before we knew of the full impact. My home, which had been affected, wasn't cleared for occupancy for eight weeks; my son waited nine weeks; others even longer. The ultimate toll tallied fires in nearly 40 homes. One person was tragically killed and roughly 30,000 had been forced to evacuate their homes.

The lesson I came away with had to do with the psychological aspects of the disaster – the human aspect. Being a victim, I experienced what it was like to be personally affected by a disaster with lots of uncertainties. Most significantly, how people spoke to me; what was helpful and what was not.

The one comment that made me cringe was when others not affected said to me, "You should be grateful; it could have been worse!" Frankly, I wanted to respond, "Easy for you to say." (At the time, I didn't feel grateful! I'm sure the family who lost a loved one didn't feel grateful.) I also didn't like it when someone said,

"I can imagine how you feel." (No, you can't!)

What would have helped? A simple, "I'm sorry" or "What can I do to help?" The biggest help were those who opened their homes, so folks could take showers, or offered meals. My daughter, Heather, who also lives in Andover but wasn't affected, had "weekend family shower time" where family would visit and luxuriate under a stream of hot water!

I learned that those of us in the middle of this crisis had our own language through our shared experiences and knew best what help was needed. All the time, I was learning how to be a better listener and how to be more effective toward others experiencing a disaster.

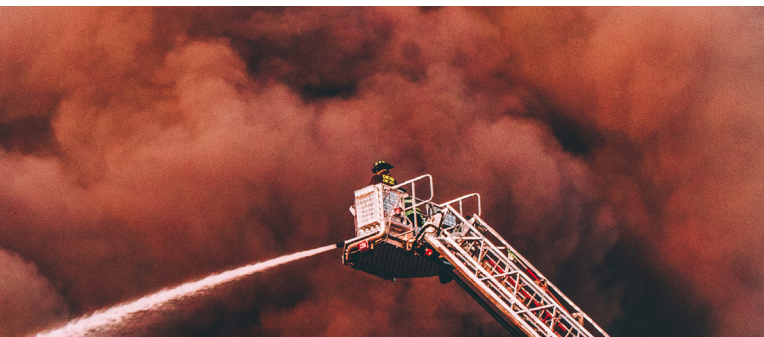
A year and a half later all is not forgotten. Those affected are back in their homes, but many are still dealing with insurance issues. When the mention of a "gas problem" pops up, all those earlier feelings are brought back. Life never will be the same – the stories are still often repeated.



This was a difficult lesson, one I couldn't plan on or really be educated for. But I know it has made me a better Civil Defense disaster volunteer through sharing my experience with others. It has helped me to think ahead when future disasters occur.

All told, there are many aspects to disaster relief, how to prepare, and the types of situations our emergency personnel face every day. I have learned one the hard way.

Gail Ralston lives in Andover, Massachusetts with her husband, Bob Decelle. For over five years, Gail and Bob have volunteered for the regional Greater River Valley Medical Reserve Corps. Gail is active in town government, currently serving on the town's Governance Study Committee and as Trustee of the town-owned Spring Grove Cemetery. Gail formerly served as Town Selectman and for many years on the Conservation Commission.



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