



July 31, 2020

THE DANGERS OF DEHYDRATION

It's no secret that water is necessary for our survival. Our bodies are comprised of 60 % water, therefore, hydrating on a consistent and regular basis plays a key role in overall health and wellness. In the hot months of summer, however, dehydration is one of the common ailments seen. Many people don't realize just how dangerous it can be if left untreated.



WHAT IS DEHYDRATION?

Dehydration is quite literally the opposite of "hydration" in that it happens when there is too little water in the body to support optimal functionality. The human body loses varying amounts of water through activity, breathing, conversing and even sleeping. When this water is not replenished, dehydration occurs— it's as simple as that. At its mildest, dehydration can be unpleasant. At its worst, the condition can be fatal.

Those considered to be at "high-risk" for experiencing dehydration include athletes, the elderly and those who live at higher altitudes, as higher elevations can lead to

faster loss of water from the body.

Common causes of dehydration include:

- Not drinking enough water
- Heat exhaustion
- Diarrhea
- Vomiting
- Sweating
- Diabetes
- Intense physical activity

WHAT ARE THE SIGNS AND SYMPTOMS OF DEHYDRATION?

Initial signs and symptoms of dehydration may be relatively mild, including thirst, decreased urine production and darkening of the urine. As the condition progresses and fluids are not replaced, however, a number of additional symptoms can occur. These may include:

- Fatigue
- Headache
- Dry mouth
- Weakness
- Muscle aches

WHAT ARE THE SIGNS AND SYMPTOMS OF DEHYDRATION? (Continued)

In extreme cases, fever, delirium and even unconsciousness may occur. These symptoms should be considered signs of a medical emergency, and treatment should be sought immediately.

DIAGNOSING AND TREATING DEHYDRATION

Dehydration is usually simple to diagnose via physical examination and patient symptom reporting, which can be beneficial in creating a treatment plan. If severe dehydration is expected, treatment with IV fluids may be recommended. Additional at-home care is often sufficient to clear up mild-to-moderate cases of dehydration.

FOUR TIPS FOR PREVENTING DEHYDRATION

While the symptoms of dehydration can be extremely unpleasant, they're also preventable. Here's how to stay hydrated and avoid "drying up" when participating in outdoor activities this summer:

1. Drink plenty of water. Drinking water is the key to hydration and will always be the first line of defense against experiencing symptoms of dehydration.
2. Stop all activity if you begin to feel symptoms. "Pushing through" an instance of dehydration may lead to additional, worse symptoms, as well as complications such as heatstroke.
3. Rest in the shade or a cool indoor space. Getting out of direct sunlight can help to halt the progression of dehydration symptoms.

BATTERY STORAGE— AN INFINITESIMAL PART OF ELECTRICAL POWER

By Steve Goreham

Published June 28, 2019 in [Energy Central](#).

Large-scale storage of electricity is the latest proposed solution to boost the deployment of renewables. Renewable energy advocates, businesses, and state governments plan to use batteries to store electricity to solve the problem of intermittent wind and solar output. But large-scale storage is only an insignificant part of the electrical power industry and doomed to remain so for decades to come.



Hybrid Battery Storage System (Image by Ysc Usc)

Last year, Senator Susan Collins of Maine introduced a bi-partisan bill named "The Better Energy Storage Technology Act," proposing to spend \$300 million to promote the development of battery solutions for electrical power. Collins stated, "Next-generation energy storage devices will help enhance the efficiency and reliability of our electric grid, reduce energy costs, and promote the adoption of renewable resources."

Arizona, California, Hawaii, Massachusetts, New Jersey, New York, and Oregon adopted statutes or goals to

develop storage systems for grid power, with New York committing to most ambitious target in the nation. In January, 2019, as part of his mandate for "100 percent clean power by 2040," New York Governor Andrew Cuomo announced a target to deploy 3,000 megawatts (MW) of storage by 2030.

Today, 29 states have renewable portfolio standards laws, requiring utilities to purchase increasing amounts of renewable energy. But the electricity output from wind and solar systems is intermittent. On average, wind output is between 25% and 35% of rated output. Solar output is even less, delivering an average of about 15% to 20% percent of rated output.

Mandating the addition of wind and solar to power systems is like forcing a one-car family to buy a second car that runs only 30% of the time. The family can't replace the original car with the new intermittent car, but must then maintain two cars.

Renewable advocates now propose electricity storage to solve the intermittency problem and to help renewable energy replace traditional coal, natural gas, and nuclear generators. When wind and solar output is high, excess electricity would be stored in batteries and then delivered when renewable output is low, to try to replace traditional power plants that generate electricity around the clock. (Continued, Page 3)

BATTERY STORAGE—AN INFINITESIMAL PART OF ELECTRICAL POWER (Continued)

Headlines laud the growth of battery installations for grid storage, growing 80% in 2018 and up 400% from 2014. But the amount of US electricity stored by batteries today is less than miniscule.

Pumped storage, not batteries, provides about 97% of grid power storage in the United States today. Pumped storage uses electricity to pump water into an elevated reservoir to be used to drive a turbine when electricity is needed. But less than one in every 100,000 watts of US electricity comes from pumped storage.

In 2018, US power plants generated 4.2 million GW-hours of electrical power. Pumped storage capacity totaled about 23 GW-hrs. Battery storage provided only about 1 GW-hr of capacity. Less than one-millionth of our electricity is stored in grid-scale batteries.

Electricity storage is expensive. Pumped storage is the least costly form of grid storage at about \$2,000 per kilowatt, but requires areas where an elevated reservoir can be used. Battery storage costs about \$2,500 per kilowatt for discharge duration of two hours or more. Batteries are more expensive than onshore wind energy, which has an installed market price of under \$1,000 per kilowatt. But a key factor in the effectiveness of storage is the length of time that the system can deliver stored electricity.

In the case of New York State, plans call for the installation of 9,000 MW of offshore wind capacity by 2035 and 3,000 MW of battery storage by 2030. The wind system will likely cost in excess of \$9 billion, and the battery system will likely cost about \$7.5 billion. But this planned battery deployment is wholly inadequate to remove the wind intermittency.

If the wind system has an average output of 33% of its rated output, then the planned 3,000 MW of battery storage would only be able to deliver the average wind output for about two hours. To replace output for a full day when the wind isn't blowing, 36,000 MW of storage would be

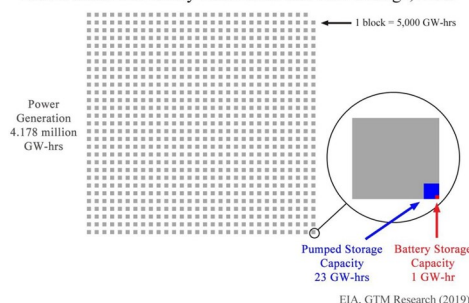
needed at a cost of \$90 billion, or about ten times as much as the wind system itself. Since several days without wind in most locations is common, even a day of battery backup is inadequate.

In addition, the 10-15 year lifetime of grid-scale batteries is no bargain. Wind and solar systems are rated for 20-25 years of service life. Traditional coal, natural gas, and nuclear systems last for 35 years or more.

Storage of electricity should be regarded as foolish by anyone in the manufacturing industry. For decades, major companies pursued just-in-time manufacturing, "lot size one," Kanban, lean manufacturing, and other programs designed to eliminate finished goods inventory to reduce costs. Electricity is delivered immediately upon generation, the ultimate zero-finished-goods-inventory product. But many organizations now clamor for electricity storage to try to fix the intermittency weakness of renewables.

Today, battery grid storage capacity is less than one millionth of national electricity output. Practical battery storage adds a cost factor of at least ten to the cost of the partner renewable system. It will be decades before battery storage plays a significant role in large-scale power systems, if ever.

United States Electricity Generation and Grid Storage, 2018



Steve Goreham is a speaker on the environment, business, and public policy and author of the book *Outside the Green Box: Rethinking Sustainable Development*.

American Public Power Association***APPA Requesting Assistance on Customer Non-Payment Survey***

Municipal electric utilities are being asked to participate in a short survey to determine the continuing financial impacts of COVID-19 on customer non-payments. APPA is conducting the survey in correspondence with efforts to secure direct financial assistance in subsequent COVID-19 legislation. Up-to-date information about customer non-payments is critical to these efforts.

The survey can be completed online [here](#).

The survey is a follow up to a longer survey conducted in May that requested information on load decline, reserve policies, and customer non-payment. While that information has been very helpful in crafting legislative language, APPA is concerned that the financial impact on public power systems may be substantially understated due to the timing of the first survey.

***INDIANA MUNICIPAL ELECTRIC ASSOCIATION******IMEA Annual Business Meeting Held October 14, 2020***

The IMEA 2020 Annual Business Meeting will be held on Wednesday, October 14, 2020. Registration is coming soon and will be held as a virtual Zoom online meeting. The meeting will be free of charge and will be useful and informative to all IMEA member utilities.

During the 2020 Annual Business Meeting, IMEA staff will provide brief updates about the numerous programs, activities, achievements and challenges of the previous year as well as the plans in place for the coming months of 2020 and the beginning of 2021. In addition to learning about what is happening inside of IMEA, staff will also provide a comprehensive review of financials, legislative & regulatory activities as well as new offerings in safety and training.

The annual business meeting is required in the IMEA by-laws for the association to conduct the formal business of the



association, including the election of leaders on the IMEA Board of Directors and Board Officers Committee. In a normal year, the IMEA Annual Business Meeting is held as part of the annual conference. Unfortunately, this year's conference had to be cancelled due to the ongoing COVID-19 pandemic. As such, IMEA is holding a virtual (ABM) this year via Zoom.



EVENT CALENDAR

August

August 3 - 7, 2020

IMEA 612 Intermediate Construction and Maintenance Workshop

Class #100118

Lebanon, IN

August 10 - 21, 2020

IMEA 610 Wood Pole Climbing Workshop

Class # 092120

Lebanon, IN

August 24 - 28, 2020

IMEA 611 Basic Construction and Maintenance Workshop

Class #093019

Lebanon, IN

October 14, 2020

IMEA Annual (Virtual) Business Meeting

Registration is coming soon!

Online

Jobs in Public Power

Public power is more to communities than just an essential utility. It is a source of unique and fulfilling career opportunities in your local community. Employees make a difference by serving their own neighborhoods and families. Talented high school, college and technical college graduates—and even technology, environmental and public service professionals—will find that competitive salaries aren't the only thing attractive about careers in public power.

To post a classified ad to our Jobs in Public Power page, please email text to janel@imea.com.

Do you have important news or photos that you would like to share in our bi-weekly newsletters? Please email all news and photos to janel@imea.com

INDIANA MUNICIPAL ELECTRIC ASSOCIATION

176 W. LOGAN ST. #225

NOBLESVILLE, IN. 46060

765.366.5506 | imeainfo@imea.com