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TERRA FIRMA

SEPTEMBER-DECEMBER 2022

PUBLISHED BY VOLUNTEERS FROM THE LOWER HUDSON GROUP SIERRA CLUB

VOTE ON NOVEMBER 8: OUR PLANET IS ON FIRE

Voter turnout has historically been lower for midterm elections than for presidential elections. Add to that all the confusion in 2022 related to redistricting and having two primaries this past summer, and we might see turnout depressed even further in November.

However, Americans might be waking up to the fact that their votes matter, even in non-presidential election years, since 2018 saw the highest voter turnout for a midterm election since 1914.¹ Recent decisions by the Supreme Court may also inspire voters to come out to vote this year.

What's at stake for the environment?

Greta Thunberg told us in 2019, "I want you to act as if the house is on fire. Because it is."² On April 4, 2022, the UN's Intergovernmental Panel on Climate Change reported that global temperature will stabilize when the world has achieved net zero carbon dioxide emissions; to keep global warming to 1.5°C, this must happen by the early 2050s.³

Yet the 2022 legislative session in NYS saw fossil fuel interests spending piles of money to fund misinformation about legislation to require building electrification for new construction in 2024, despite the fact that building a new all-electric house is \$7,500-\$8,200 cheaper than building one that also uses fossil fuel.⁴ Cryptocurrency miners using energy-intensive Proof of Work methods pressured lawmakers to sink a bill that would prevent the resurrection of the state's dirtiest retired fossil fuel plants which would spew greenhouse gases and foul the air in disadvantaged communities where they are located, just for the profits of a few wealthy individuals. Fortunately, dedicated efforts by environmental activists resulted in the cryptocurrency moratorium getting passed by the legislature.

Vote to elect candidates who will protect the environment

Legislation to reduce waste, protect our air, water and open space, and transition to a clean energy economy also passed in 2022 due to the courage and leadership of elected officials who understand threats facing our environment.

You can help ensure these and other environmental champions go to Washington, D.C. and Albany to advocate for the planet and the precious life it supports. Check out our list of Sierra Club endorsements at <https://atlantic2.sierraclub.org/> (click on the "Politics and Issues" link on the Home page) and consider these candidates as you go to the polls on November 8.

Also, don't forget to **turn over your ballot and vote YES on the Clean Water, Clean Air and Green Jobs Environmental Bond Act**. For more information, see pages 2 and 3 of this newsletter.

¹ https://en.wikipedia.org/wiki/2018_United_States_elections

² <https://www.weforum.org/agenda/2019/01/our-house-is-on-fire-16-year-old-greta-thunberg-speaks-truth-to-power/>

³ <https://www.ipcc.ch/2022/04/04/ipcc-ar6-wgiii-pressrelease/>

⁴ <https://newbuildings.org/resource/cost-study-of-the-building-decarbonization-code/>



Membership Meeting Schedule

Visit SierraLowerHudson.org and select Events

Visit RocklandSierraClub.org

All meetings via Zoom, link on websites



VOTE YES ON NOVEMBER 8TH

CLEAN WATER, CLEAN AIR, AND GREEN JOBS BOND ACT

New York voters have a once-in-a-generation opportunity to protect clean water, update infrastructure, and improve quality of life in every county of the state.



Safeguard clean drinking water, our most priceless resource



Support nearly **100,000** family-sustaining **jobs**



Update infrastructure including roads, sewers, and drinking water pipes



Conserve wildlife habitats, farms, forests, wetlands, and more

If approved by voters, the Clean Water, Clean Air, and Green Jobs Bond Act will:

SAFEGUARD DRINKING WATER

New York's rivers and lakes supply drinking water to millions of New Yorkers every day. The Bond Act will invest at least \$650 million to protect clean drinking water by replacing lead pipes, expanding sewers, updating water treatment plants, and preventing pollution and runoff.



PRESERVE FARMS AND FORESTS

From Ellis Island to the Adirondack Mountains, New York is defined by its unique, natural scenery. Parks, forests, and farms provide mental and physical health benefits. The Bond Act will invest at least \$650 million to conserve open space, protect family farms, and expand access to parks, campgrounds, and nature centers.

Paid for by Vote Yes for Clean Water and Jobs

STRENGTHEN NEW YORK'S ECONOMY

Replacing lead pipes, updating sewers, fixing roads, and retrofitting buildings - all create jobs. The Bond Act will help revitalize local cities, towns, and villages by supporting nearly 100,000 good, local, family-sustaining jobs.



ADVANCE ENVIRONMENTAL JUSTICE

Every New Yorker deserves clean air to breathe, clean water to drink, and access to nature. But not everyone does. The Bond Act will help advance environmental justice by directing at least 35-40 percent of total funding to disadvantaged communities, those most harmed by pollution.

UPDATE COMMUNITY INFRASTRUCTURE

The Bond Act will invest at least \$1.1 billion to update aging or failing infrastructure and conserve wildlife habitats. Funds will help update roads, bridges, and stormwater systems and repair wetlands, forests, and shorelines, improving quality of life and saving taxpayers' money.



IMPROVE PUBLIC HEALTH AND SAFETY


Bond Act programs will bring cleaner air to breathe by investing \$1.5 billion in projects that cut pollution. Funds will help expand clean energy infrastructure; retrofit public buildings; plant street trees; build green roofs; create community gardens; purchase clean school buses; and build cooling centers that save lives during heatwaves. These projects will increase energy reliability and improve public health and safety.


Visit Us



Vote Yes for Clean Water & Jobs is a broad coalition working in support of New York's 2022 Clean Water, Clean Air, and Green Jobs Bond Act.

Paid for by Vote Yes for Clean Water and Jobs

 voteyescleanwaterandjobs.com

 info@voteyescleanwaterandjobs.com

   @NYBondAct

LONG-DURATION STORAGE CRITICAL FOR A RENEWABLE ENERGY GRID

By Laura Burkhardt

The main argument against a renewable energy grid put forth by fossil fuel and nuclear proponents is that the wind is not always blowing and the sun is not always shining. Ergo there will be periods, such as extended cold spells, summer heat waves, days of continual rain, when the grid will not be able to provide needed electricity. During these times we need firm dispatchable resources, i.e., natural gas, oil, nuclear energy, to power the grid – or so the argument goes.

But there are alternatives to these firm dispatchable resources. One of the most important is long-duration energy storage. Lithium-ion batteries currently dominate the energy storage market, but they are better suited for short-term storage because the charge they hold dissipates over time. Storing sufficient energy for months or years would require many batteries, which is too expensive to be a feasible option. These batteries have several other shortcomings which make them infeasible for grid-level power.

Short-term storage: Most battery-based solutions store energy from one to four hours. Longer-lasting solutions (12+ hours) are not cost-effective.

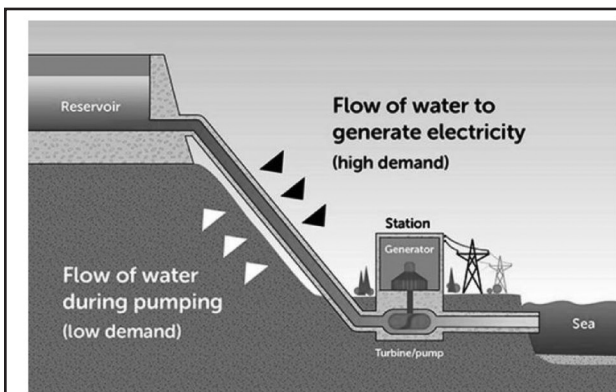
Limited battery life: Batteries last for a finite number of recharge cycles, and their life is shorter in cold weather use.

Overheating risk: The risks are seen when operating temperatures are high, and when batteries are charged in freezing temperatures.

Environmental concerns of lithium: Production of lithium batteries is energy intensive with a high carbon footprint, and the disposal of such batteries is an environmental concern. Lithium on a large scale is associated with resource depletion, global warming, ecological toxicity, and human health impacts.

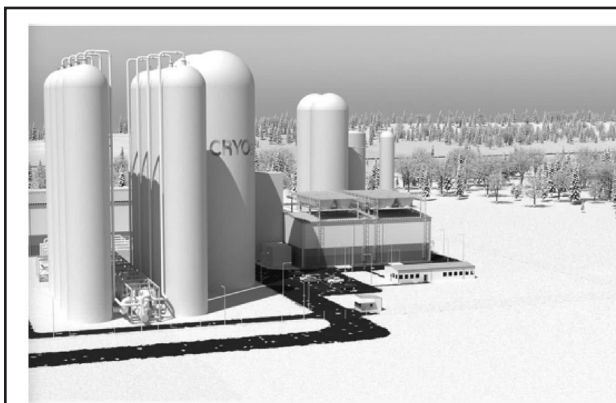
To have a reliable 100% renewable energy grid, we will need storage that can provide electricity to the grid for many hours or days and even weeks. Instead of looking at alternative fuels like hydrogen and RNG to power the grid, we should be going all out on long-duration storage. It will be hard and it will be expensive, but it is essential.

There is a growing list of possibilities that use diverse technologies and are at different stages of commercialization. A few examples are shown below. For more description and comparison of these technologies, refer to the full article: [*Long Duration Energy Storage Technologies: A Survey*](#), which you can read at SierraLowerHudson.org; click on the Issues tab.



Pumped hydro physically moves water from a low to a high reservoir. The water descends, when needed, to generate electricity. This is a well-known and utilized concept.

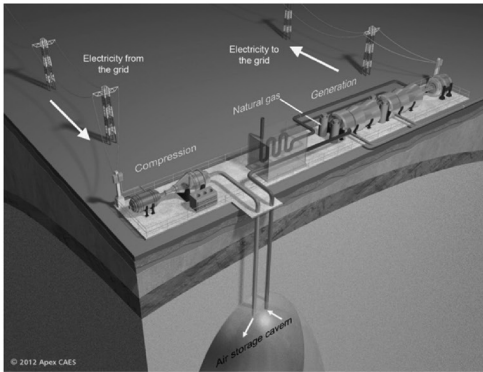
These systems can store massive amounts of energy but require mountains and reservoirs and are difficult to build.



Liquid-Air Energy Storage in Northern Vermont

In **Liquid-Air Energy Storage** electricity is used to cool air to -196°C , substantially shrinking its volume. This cooled air is stored in steel tanks. When it is exposed to ambient temperatures, the rush of air from its rapid expansion directly drives an electricity-generating turbine.

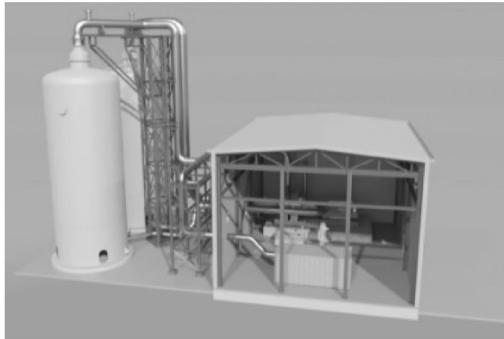
This technology is available today and has zero emissions and zero water impact. But it is only practical on a large scale and has a lower round-trip efficiency than batteries or pumped hydro.



Compressed Air Energy Storage System by Apex

Compressed-air energy storage (CAES) plants operate by using motors to drive compressors, which compress air to be stored in suitable storage vessels. The energy stored in the compressed air can be released to drive an expander, which in turn drives a generator to produce electricity.

These plants have a very large power rating and storage capacity, low self-discharge, and a long lifetime. But they require large areas for storage, such as underground salt caverns; such areas may not be readily available in New York.



The GridScale energy storage plant, consisting of an adjustable number of storage tanks and a charge-discharge system.

The GridScale system by Stiesdal Storage Technologies is a **pumped thermal energy storage** system that uses crushed basalt rock (which is abundant and low-cost) as a storage medium. The technology heats up pea-sized crushed stones in insulated steel tanks using an innovative pump-based system and releases the stored energy via a turbine to produce electricity.

The technology is not yet completely proven or commercialized. There are two trial projects ongoing.



CO2 battery facility in Sardinia, Italy

CO2 Battery by Energy Dome, not really a battery, is a system that stores energy by changing the state of CO2 in a closed loop. The CO2 is first pumped from a large, closed container and compressed, then converted to a liquid. To discharge, the liquid CO2 is released from the storage tanks causing it to convert back to a gas and expand. The pressure from the expanded CO2 powers a turbine, generating electricity.

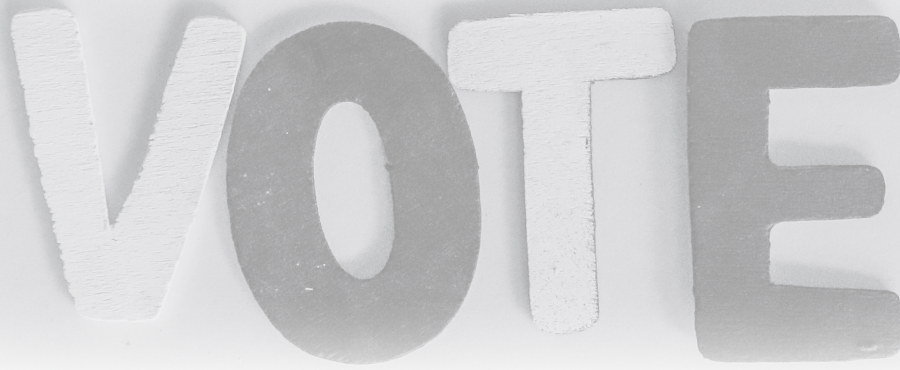
This system uses off-the-shelf equipment, is cheaper than batteries and has a lower environmental impact. But it has a large footprint, which may be a limiting factor.

There are four conclusions that can be drawn about long duration energy storage.

- **There is no one perfect solution.** Some of the more advanced concepts have many advantages but have not been yet fully proven or commercialized.
- **Long-duration storage should be an essential part of large-scale wind and solar installations.** Wind and solar power (especially wind) that needs to be curtailed¹ must have a place to go, namely, long-duration storage. Provision for on-site storage should be part of these large-scale projects.
- **The Climate Leadership and Community Protection Act (CLCPA) enacted in New York State in 2019 should be modified to specify the amount of long-duration storage that is needed.** CLCPA specifies 3,000 MW of energy storage by 2030, but does not specifically address long-duration storage. Battery storage by itself is not sufficient.
- **There should be an incentive and financing program for long-duration storage.** There should be NY legislation to subsidize long-duration storage, similar to bills to subsidize renewable hydrogen (e.g., S.3281/A.3788).

Note: The opinions expressed in this article are solely those of the author and are not necessarily supported by Sierra Club.

¹<https://www.nyiso.com/-/unbottling-wind-how-we-can-expand-clean-energy>



2022 ELECTION BALLOT
EXECUTIVE COMMITTEE, SIERRA CLUB LOWER HUDSON GROUP
VOTING DEADLINE DECEMBER 31, 2022

YOU CAN VOTE ONLINE!

Please check your email Inbox in December for your 2022 Sierra Club Atlantic Chapter and Lower Hudson Group ballots, which will be sent to all members with email addresses on file. You must choose to EITHER vote online OR by filling out this paper ballot.

There are four vacancies on our Executive Committee (“ExCom”).

Candidate Statement of Edward Berry:

Now more than ever our political process is essential to our survival as a democracy. We all must pay attention to who our political leaders are and what they stand for. This is why I volunteered to be the Political Chair for the Lower Hudson Group. Two years ago, through hard work by many like-minded citizens, we changed the leadership in the House of Representatives. We also brought about key changes in NY State government. We have witnessed the effects of those positive changes already. Our state is leading the way on legislation dealing with climate change. This November we will be faced with a decisive battle for the future of our country. It is a fight we need to win. Together we can. Remember our shared values and vote!

Candidate Statement of Linda Brunner

It's been an adventure to be on the ExCom of the LHG these past few years. My role has primarily been as a liaison with organizations such as Friends of the Great Swamp in Putnam County and the Airport Coalition, and elected bodies (Westchester County Board of Legislators and Yonkers City Council), where our impact is increased by cooperation. Representing LHG in committees such as Container Gardening, and Steering for the Planting Westchester effort initiated by County Executive Latimer was another great way to cooperate. I especially appreciate being involved in vetting with candidates for election and determining whether we will endorse them. I am convinced that knowing whom we can rely on to vote and exercise their voice and power in line with Sierra Club principles and guidelines is critical.

Candidate Statement of Peggy Kurtz

With its nationwide network of activists, I believe Sierra Club can play a key role in creating a strong grassroots climate movement. A lifelong environmental advocate, I started Rockland Sierra Club in 2006 to work on climate change. I led the successful campaign to establish the Rockland Community Power renewable energy program, soon available to over half of Rockland's population. I co-founded the Rockland Water Coalition, which stopped Suez's energy intensive desalination proposal. As an appointed member of the Rockland County Water Task Force, I've also led efforts to ensure thorough cleanup of toxic PFAS chemicals in Rockland's drinking water and helped lobby for stricter regulation of PFAS and a ban on PFAS. I would welcome the opportunity to continue to serve on the Executive Committee of our group.

Candidate Statement of Liam Robb O'Hagan

I was born and raised in New Zealand before moving to the US 20 years ago. I'm a life-long environmentalist with degrees in sociology and zoology, and I've worked as a trekking guide, journalist, website producer and most recently a lead parent. Now that my kids are able to fend for themselves, I'm looking for a new challenge. I want to do some good, rather than sell more stuff. When I was in Chicago, I helped with the campaign to close the city's coal-fired power plants, and I recently joined the Village of Mamaroneck Committee for the Environment and started helping the Lower Hudson Group with communications, through our website, newsletter and social media. Two years ago, I was elected to the LHG ExCom and I would appreciate your support to continue that work.

Candidate Statements continued from previous page

Candidate Statement of Jeff Schumann

I have been an active member of the Sierra Club in NY since January 2021, where my focus has been on the climate crisis, energy issues specifically. I have seen the successes we at both the Chapter and Group level have had here in NY in advancing renewable power generation and actions to ween us off fossil fuels. I am grateful to have played some small part in those efforts. I am on the Chapter Energy Committee, the Legislative Committee and am the chair of the Large-Scale Renewable Energy sub-committee. I believe that the LHG, in collaboration with others, has a great opportunity to promote and advance the development of small-scale renewable power generation in our area. I would welcome the opportunity to bring my thoughts and collaborative work style to the LHG ExCom team.

Candidate Statement of Martha Upton

I believe ending our dependence on fossil fuels is an urgent necessity, and I began volunteering with the Sierra Club because it is uniquely positioned to help lead the transition to a clean energy future. As LHG Conservation Co-chair, I've been working with the Chapter's Energy and Legislative Committees on a range of issues including renewable heat for buildings, the changeover to electric vehicles, responsible wind and solar siting, blocking new gas infrastructure, and protecting pollinators. I regularly help organize meetings and actions around critical climate and conservation issues for our LHG members. I also serve on the Climate Smart Task Force for Phillipstown, which has committed to carbon neutrality by 2040. It would be an honor to join the ExCom and help develop new opportunities for local members to become actively involved in our work.

BALLOT

Please vote for up to four candidates. If you vote by paper ballot, cut off this whole page and mail to Laura Burkhardt, 1401 Kendal Way, Sleepy Hollow, NY 10591 so that it is received no later than December 31, 2022. Member information, needed to verify that the member has not also voted online, will be separated from votes before votes are tabulated to ensure secrecy.

Vote here:

- Edward Berry
- Linda Brunner
- Peggy Kurtz
- Liam Robb O'Hagan
- Jeff Schumann
- Martha Upton

*If you have a joint membership, vote here also:

- Edward Berry
- Linda Brunner
- Peggy Kurtz
- Liam Robb O'Hagan
- Jeff Schumann
- Martha Upton

*If you have a single membership, this column will be ignored when votes are counted.

To help out with or be present at the vote counting in early January, 2023, please email sierralowerhudsonelection@gmail.com or call 914.922.1407 by 12/15/2022.

Join us to work on environmental issues in Rockland County!

Rockland Sierra Club was one of the groups leading the successful effort to defeat plans to desalinate Hudson River water for Rockland's drinking water. We are now helping the County craft a sustainable water management policy. We are also working to limit new fossil fuel infrastructure and have partnered with 350.org on efforts to address climate change through divestment and through promoting Climate Smart/Clean Energy Communities programs for towns and villages.

Rockland Sierra Club usually meets on the second Monday of each month.

Check RocklandSierraClub.org for dates and locations. For more information: pkurtz9@gmail.com or deby1012@gmail.com. Or call 845-709-0802.

VITAL NUMBERS LOWER HUDSON GROUP SIERRA CLUB

Local Sierra Club website:
SierraLowerHudson.org

Rockland Sierra Club website:
RocklandSierraClub.org

For contact info on our core activists,
please visit SierraLowerHudson.org
and select About Us



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WESTCHESTER, PUTNAM & ROCKLAND COUNTIES

"Cease being intimidated by the argument that a right action is impossible because it does not yield maximum profits, or that a wrong action is to be condoned because it pays."

-Aldo Leopold



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Inside

.....

Vote On November 8: Our Planet Is On Fire 1

Clean Water, Clean Air, And Green Jobs Bond Act 2-3

Long-Duration Storage Critical For A Renewable Energy Grid 4-5

Election Ballot for Lower Hudson Group's Executive Committee 6-7