Addenda #37 – December 2025 Update
Re: Ch. 8, 2050 Net-Zero Emissions; Impossible!!

SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all
SDG 3 – Ensure healthy lives and promote well-being for all at all ages
SDG 17 – Strengthen the means of implementation…

The background:
In the New York FY2023 state budget, Governor Kathy Hochul mandated the electrification of all school buses in NY state. By 2027, all new school bus purchases must be zero-emissions, and by 2035, all school buses on the road must be zero-emissions. Governor Hochul touted this mandate, claiming it would reduce emissions, result in better health outcomes for students and create hundreds of new jobs in the state.

Charging Forward: New York's Costly Rush to Electrify School Buses
Empire Center, November 4, 2022

A new law requires New York State's school bus fleet be entirely zero-emission by 2035. But the higher price of electric school buses relative to diesel buses, the cost of necessary new infrastructure to support electric buses, and the limited funding available for the transition make it unlikely that the state can achieve full electrification by that deadline.

Replacing all of the state's diesel-fuel school buses with electric buses will cost between $8 and $15.25 billion more than the cost of replacing them with new diesel buses. Of that amount, less than $800 million – less than 10 percent of the transition cost – may be available from a combination of state and federal sources to help school districts and private fleet operators make the transition.

The extra cost of electric buses, their limited range compared to diesel buses, and their more rapid battery depletion in cold weather and hilly terrain will create substantial challenges for local school districts.

'In a Bind': Some New Yorkers Reject Transition to Electric School Buses, Despite Mandate
New York Focus, December 18, 2024

New York's push for electric school buses by 2027 has districts across the state struggling with voter approval and funding.

Of the state's 31 districts that tried to pass propositions this year specifically to purchase an electric bus, 10 had their measures rejected by voters, according to data compiled by the New York State School Boards Association.

New York Pushes Forward with Electric School Bus Mandate Despite Opposition
School Transportation News, March 5, 2024

"The reliability problem is a major drawback, but unfortunately just one among many when it comes to this still-new technology," said Borrello, citing a news article last week on experiences of Bethlehem Central School District near Albany, where five of seven electric buses were reportedly out of commission for repairs. "These buses carry an exorbitant price tag, not only for the vehicles themselves, but for the needed infrastructure and transmission upgrades, and their traveling range is far less than conventional buses, even in ideal weather conditions."

The Fayetteville-Manlius school district in Central New York sent out a newsletter this May, detailing the district's 2025-2026 School Budget which included the purchase of 6 diesel school buses. The newsletter noted that by New York state law, all school bus purchases must be electric beginning in 2027, preparing voters for inevitable cost increases. (The cost of a typical 70-83 passenger type C diesel school bus starts at $140,000 while the electric version starts at $320,000 before state or federal grants are applied.) The newsletter also included an article about a "trial run" the district conducted in February with an electric school bus to see how it would perform on typical F-M bus routes. The article title; *F-M conducts trial runs with electric buses; Performance falls short of expectations.*

The transportation department conducted two trials on different days, leaving the transportation center fully charged with enough battery to travel an estimated 94 miles according to the dashboard battery gauge. The New York State Energy Research and Development Authority (NYSERDA) website claims this bus has a range of 100 miles when fully charged, so the driver begins his run with 8% less range than advertised.

The first trial was conducted at temperatures ranging from 10 to 15 degrees. After traveling 45 miles, the battery had just 5% charge remaining. As I noted in the original Addenda #37, electric batteries lose their charge much quicker in colder weather, having to keep the components and occupants warm using battery charge for electric heat and leaving little room for error in case of travel delays. Note: Fayetteville NY had 16 days of below freezing temperatures in February; five of them at or below zero degrees with windchill.

The second trial was conducted at temperatures ranging from 20 to 25 degrees. The article stated *"Trial run 2 yielded better results, with 50% of the battery charge remaining after traveling 42 miles. This was due to the driver periodically turning down the heat inside the passenger cabin, a practice that is recommended to conserve battery energy."* (Funny how *that* recommendation is never mentioned by Democrats promoting the benefits of electric buses your children will ride in) In temperatures below freezing, the bus would only be able to travel a little more than 80 miles, 20% less than it's rated distance. And *only* if the driver "periodically" turned down the temperature heating the cabin where dozens of children would be traveling 30 minutes or longer to school during the coldest months of the year.

The article noted that both trial runs were done on days with calm weather and clear roads. Imagine being stuck on a school bus on a windy, snowy day when the driver has to travel slower than normal, increasing the amount of time spent on a cold bus and depleting the battery charge even faster. This creates a potential safety hazard for the students, if they were ever to be stranded in winter weather with their only source of heat, electric batteries, rapidly losing their charge. The article continued…

At the end of trial 1, the bus was charged inside the bus maintenance garage, an option that would not be viable long-term. The estimated time to fully recharge the battery, as indicated by the bus's dashboard battery gauge, was 26 hours. Charging the electric bus outdoors proved to be problematic. When the electric bus was parked outside in the cold with a low battery, the bus blew a fuse multiple times. This is due to an increased need for energy to charge the battery and simultaneously run the heater to keep the battery warm.

Conclusions:
1. The range of the school buses, new "out of the box," is not what they're advertised to be. School districts may not be able to complete full schedules or as many runs per bus.
2. The range of the electric bus is further reduced by having to run heaters to keep the equipment and students from freezing in extreme weather conditions.
3. Problem #2 can be solved by turning heaters down or off "periodically." But this affects the comfort and health of children traveling for extended periods of time in cold weather.
4. Inclement road conditions can increase the length of runs, leading to even more charge depletion. This is a potential safety issue for the dozens of elementary school children riding on electric buses.
5. Charging electric buses outside in cold weather further increases the charging time, creating situations in which the bus may not be able to return to service the following morning with a full charge to begin its first run.
6. Problem #5 can be solved by constructing indoor heated maintenance garages for storage ang charging of buses during extreme weather conditions.
7. School Districts in cold winter climate locations will have to spend tens of millions of dollars on new transportation facilities capable of charging electric buses and protecting them during extreme weather conditions.

Lake Shore unveils 20 new electric buses with $7.9M EPA grant
Observer, Dunkirk NY, July 2, 2025

ANGOLA — Lake Shore Central School District officially cut the ribbon Monday on 20 brand-new electric school buses, a milestone made possible through a $7.9 million grant from the U.S. Environmental Protection Agency (EPA), championed by Senate Majority Leader Chuck Schumer as part of the Bipartisan Infrastructure Law. This marks one of the largest single-district electric bus deployments in New York State.

"This project represents years of planning, collaboration, and commitment to innovation," said Superintendent Daniel Pacos. "We've replaced nearly half of our fleet with zero-emission buses — at virtually no cost to local taxpayers. These new buses will provide a quieter, healthier, and more efficient ride for our students while reducing emissions in our community."

Parents raise concerns over heat issues in electric school buses in Lake Shore Central School District
WIVB4 News, Buffalo NY, December 18, 2025

ERIE COUNTY, N.Y. (WIVB) — On the heels of a statewide mandate requiring all school bus purchases in New York State be electric by 2027, parents in the Lake Shore Central School District are speaking out, claiming some bus drivers are turning the heat down, or off completely, in an attempt to conserve battery life on their electric school buses.

WIVB News 4 has received several calls from concerned parents in the school district, which covers parts of Angola, Brant, and Derby, regarding their child's bus trips to and from school, claiming they're coming in freezing when they get home after getting off the bus. The kids are coming home saying their bus is freezing cold and the parents are giving them hand warmers.

What was the conclusion of that Fayetteville Manlius trial again? Oh yeah, *Performance falls short of expectations*

Erie County had already endured thirteen days of temperatures *below freezing* when this article was written, including "real feel" temperatures below zero. Parents of children traveling on electric buses reported that their children were coming home saying their bus is freezing cold. When parents complained to the transportation department, they were told running the heat drains the battery capacity of the bus itself. Parents also reported that they had heard at least one electric bus had broken down and showed a photo of it being towed by a heavy tow truck, while children waited more than half an hour outside in freezing temperatures for its replacement to arrive. One woman that watches her grandson after school told reporters, "My grandson came home from school last week when it was 23 degrees. He said they didn't have heat. He came in cold, and I told him, I said, 'isn't the bus warm?' And he said 'no, they can't put the heat on because it drains the battery.'"

"This is the third year Lake Shore CSD has had zero emission buses in service. Our students enjoy the quiet ride…"
Perry Oddi, Transportation Supervisor, Lake Shore Central School District

"They're"positive reviews" and effective climate change mitigation improving the air quality for our kids across the state, so, where these buses are in service, we're seeing a lot of positive reviews"
Adam Ruder, Director for Clean Transportation at the New York State Energy Research and Development Authority (NYSERDA), May 23, 2025

"New York continues to lead the charge on prioritizing student health. This additional funding reflects the state's commitment to delivering quiet, clean rides for the more than two million students who ride the bus to school in New York."
Sue Gander, Director of World Resources Institute Electric School Bus Initiative, May 9, 2025

Prioritizing "student health" by forcing them to ride cold school buses…

Cold weather reduces range and reliability of electric buses, Cornell study finds
WAER 88.3 Syracuse Public Media (NPR), May 29, 2025

Moving to electric buses will have challenges. Cornell University researchers completed a two-year study in Ithaca and found that electric buses struggled with cold weather, becoming unreliable with reduced range.

Cornell researchers found that getting and keeping bus batteries at proper temperatures and keeping bus interiors heated consumed 48% more energy at temperatures between 25 and 32 degrees. They also found that the bus breaking is impacted by cold weather, leading to potential safety issues. Their solution is to have school districts build facilities large enough to keep electric buses inside during inclement weather while charging and not in service. The West Genesee Central School District recently proposed a $77.9 million Capital Improvement Project, including electric charging infrastructure and a new 35,400 square foot transportation building. The proposed building would include just 8 maintenance and repair bays, with no storage for 112 electric buses that will eventually replace the existing diesel fleet. To construct indoor facilities for electric bus storage and charging would require more than 245,000 additional square foot structure, making the project "cost prohibitive."

Note: The Capital Improvement Project Referendum was defeated by district taxpayers.

Hot Weather Impacts on Electric School Buses
Federal Joint Office of Energy and Transportation, Technical Assistance Help Sheet, July 2024

Electric school buses are proven to operate effectively in hot weather; however, extreme hot temperatures could adversely impact their range and effciency… Hot temperatures (80°F and higher) can reduce vehicle effciency and performance and require additional energy for cabin and battery cooling.

Ok, now we find out that electric buses do not operate efficiently at temperatures below 32 °F or above 80 °F. In 2025, there were 131 days of temperatures below 32°F and 73 degrees above 80 °F in Syracuse New York, where the Fayetteville-Manlius and West Genesee CSDs are located. Last year electric buses (or electric cars for that matter) would ***not*** have operated at their listed efficiency on 56% of days in the year. One study done by the Hong Kong Polytechnic University found that increased demand for heating and air conditioning under "extreme weather conditions" can reduce battery performance and reduce driving range by up to 50%. Think of your children riding an electric school bus in extreme cold or hot temperatures, the driver reducing or shutting down heating, air conditioning and ventilation to save battery range. Think of people riding public transportation electric buses under the same conditions. Think of you, riding in your electric vehicle, mandated by New York Democrats, having to choose between comfort and range.

> *SDG 7 - Ensure access to affordable, reliable, sustainable and modern energy for all*
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Training current diesel bus mechanics to service and repair electric buses is going to be as much of a challenge as the actual performance issues electric buses (and cars) have.

Rush to deploy electric school buses raises worries over maintenance, safety issues
Herzog Foundation; The Lion, June 14, 2024

As hundreds of school districts nationwide work to replace gas-fueled school buses with electric ones, journalists and school officials are sharing concerns over maintenance and safety.

Districts in places such as Maine, New York, Michigan and California have reported issues with these buses – ranging from battery failure, steering problems and sudden power outages to charging logistics.

Anthony Watts, longtime meteorologist and founder of the award-winning "Watts Up With That" website, cautions against the "rapid push" to electrify public transport without considering the engineering challenges beforehand.

"The shift to electric buses is often touted as a necessary step towards combating climate change, yet the real-time execution of these policies must be scrutinized," he wrote in a recent article. "Are we advancing towards a future of sustainability at the expense of present-day reliability and economic accessibility?"

EPA Has Funded 8,000+ Electric School Buses – But Demand Still Outpaces Funding
Electric School Bus Initiative, July 8, 2024

In less than two years, the U.S. Environmental Protection Agency's (EPA) Clean School Bus Program (CSBP) has funded more than 8,000 electric school buses in 49 states, four U.S. territories, Washington DC, and 55 Tribal school districts.

Let's do the math on Joe Bidens school bus replacement program for a minute…

1. President Biden set a goal to replace the entire fleet of U.S. diesel school buses, by allocating $5 billion dollars to the *Clean School Bus Program* (CSBP) in 2021.
2. At that time, there were more than 475,000 school buses operated by over 11,000 school districts across the U.S.
3. Of that number, roughly 13,759 of those were electric school buses. That means there are still 466,764 diesel and gas fueled school buses in service to be replaced.
4. On December 30, 2025, the EPAs Clean School Bus Program webpage shows a total of $2.622 billion of awards to 1,152 school districts, replacing 8,236 diesel school buses.
6. Based on those numbers, that's an average cost of $318,452 per electric bus purchased.
7. At an average cost of $318,452 per electric bus, it will take an additional $148.641 billion to replace the remainder of the nation's diesel school bus fleet with electric buses.
9. There is $2.377 billion remaining in funding for additional CSBB awards. By my math, that means there is a shortfall of more than $146 billion in order to achieve Biden's goal.

Of course, Biden and the Democrats knew that would never be enough money to convert the nations school bus fleet. But getting enough votes to pass a bill including $5 billion for that purpose would be a whole lot easier than getting enough votes to pass a bill including $151 billion for that purpose. Biden figured he'd be elected for a second term in 2024, Democrats would retain or increase their control of the Senate and House, and he could go back to the well for that additional $146 billion at a later date. Didn't quite work out that way though…

New York State commits to 100% electric school buses by 2035
electrek, April 8, 2022

Governor Kathy Hochul (D-NY) yesterday agreed a $220 billion state budget with legislators, and it includes a plan to make the state's approximately 50,000 school buses 100% electric by 2035.

There are roughly 50,000 school buses on streets in New York State, polluting the communities they operate in with harmful emissions… "This plan makes New York the first state in the country to commit to fully electrifying its school bus fleet and sets a clear benchmark for other states looking to protect kids' health."

New York voters had no say in this decision, it was decided for them by progressive Democrat politicians. In November 2022, more than 3.5 million New York voters passed Proposal 1, the Environmental Bond Measure (EBM) and supported borrowing $4.2 billion for projects related to the environment, natural resources, and water infrastructure, as well as projects classified as climate change mitigation. This included $500 million for NYSERDAs *New York School Bus Incentive Program* (NYSBIP) to fund school bus electrification, including the purchase of 45,000 diesel and gas school buses.

Now let's do the math on Kathy Hochul's school bus replacement program…

1. Governor Hochul set a goal to replace the entire fleet of N.Y. diesel school buses, by allocating $500 million dollars to the *New York School Bus Incentive Program* in 2022. Note: This program awards vouchers in varying amounts to help school districts with the Cost of new electric buses, chargers and electrical infrastructure.
2. At that time, there were approximately 45,000 diesel and gas school buses operated by 900 school districts across the state, that would have to be replaced over thirteen years.
4. As of this summer, the NYSBIP had awarded $214.273 million in funding to 88 school districts, for the purchase of 685 new electric school buses, charging stations and infrastructure upgrades.
5. Based on EPA numbers above, the cost of each electric bus averages $318,452.
6. Using that average cost per electric bus, it will take an additional $14.1 *billion* to replace the remainder of the state's diesel school bus fleet with electric buses. This does not include any money for the infrastructure required to support their use.
7. As of December 2025, the NY State Energy Research and Development Authority (NYSERDA) has made *three* funding announcements totaling $500 million from the NYSBIP for the purchase of zero-emission school buses.
8. There is $0 remaining from the original Environmental Bond Measure allotment for the NYSBIP. By my math, that means there is still a shortfall of more than $13.8 billion in order to achieve Hochul's zero-emissions school bus goal.

Of course, Hochul and the Democrats knew $500 million would never be enough money to convert the nations school bus fleet when the bond measure was passed in 2022. But getting enough votes to pass a bill including $500 million for that purpose would be a whole lot easier than getting enough votes to pass a bill including $14.3 billion for that purpose. Hochul figured she'd be elected for a second term in 2026, Democrats would retain their control of the Senate and Assembly, and she could go back to the well for that additional $14.3 billion at a later date. Sound familiar?

Note: In May 2025, Governor Hochul signed a bill extending the time to transition bus fleets to zero-emissions. School districts will have to apply for a waiver, showing difficulties they are having with the transition, as well as showing the progress they are making towards meeting that goal. The pressure put on Hochul when she is running for reelection, came from constituents, fellow Democrats and school districts citing costs involved and the financial burden on taxpayers. Experts in the field of zero-emission buses have noted the move won't work for all districts, especially Upstate New York school districts with large numbers of students, cold weather, and hilly terrain. National Grid officials have said the states electric grid is not yet ready to support 45,000 electric school buses. There is also a shortage of mechanics trained to maintain and repair electric systems in buses, charging infrastructure and indoor storage facilities for buses in areas with extreme weather conditions.

The proposed extension is for the start of mandatory bus purchases only, the 2035 end date for 100% fleet replacements has not changed. Schools will have to start later, have less time and little state support to complete the transition to electric buses, putting the burden on school districts to raise taxes and go deeper into debt to meet the governor's mandate. The vouchers NYSERDA awards school districts are capped at maximum amounts for each electric bus purchase and for charging infrastructure, leaving school district taxpayers on the hook for the balance of spending required for fleet transition.

As of March 2025, only one Central New York school district had approved the purchase of an electric school bus. The rest continue to purchase diesel buses ahead of the 2027 start date. Superintendents of rural school districts worry about costs and reliability. Long Lake Superintendent and Principal Camille Harrelson stated, "Because we're a merged sports team, if we pick up our kids, go to Indian Lake to pick up those kids, and then travel to Chazy for a game, our buses can't make it back on an electrical charge. The area itself is just too great and too drastic." Rural utility companies don't have the resources to provide increased capacity required for charging electric buses either. There's no infrastructure for electric buses in this area. The electric companies don't have what they need to even support us to make that happen," Harrelson added.

Cummins CEO Says Mixed Fuel Approach is Key for Commercial Sector
School Transportation News, May 13, 2025

Jennifer Rumsey has spent the last 25 years at Cummins Inc., a global leader in diesel engines and power generation, first as a mechanical engineer and later as an executive. "I've seen us over the last several decades, we've made real progress, real impact together," she said, adding that even in terms of diesel engines, the industry has significantly reduced emissions and improved fuel efficiency. She noted in the article that "advancements in fuel injection systems, turbo chargers, after treatment and controls, have reduced NOx and particulate emissions by more than 98 percent in the U.S. and 90 percent globally. "To put that into perspective, today, it takes 60 class eight semis to emit what a single semi-truck emitted in 1988." According to Rumsey, Cummins has been able to improve per-gallon fuel mileage on heavy duty diesel engines by nearly 25 percent over the last fifteen years while reducing diesel engine greenhouse emissions by millions of metric tons. Rumsey says the balance between emissions reductions, fuel efficiency and engine reliability lies with the use of "mixed fuels" including batteries and biodiesel fuel, which will be "in the mix" for a long time yet. "We need to set clear and challenging but also achievable goals that drive innovation and allow the best technologies to compete and help meet the standards we set… no single solution will meet our broader goals."

Progressive Democrats supporting Agenda 2030 support the electric only option for a sustainable future. It is unachievable by 2027, by 2030, by 3035 or any other future date.

"It doesn't matter what is true, it only matters what people believe is true… "
Paul Watson, Co-founder of Greenpeace