Documents for the Record

Energy and Commerce Committee

Subcommittee on Oversight and Investigations

1. "Public Funds Are Better Spent on Propane School Buses" – Tucker Perkins, *Buffalo News* (04/26/2023)
2. "Cold Weather Considerations for Electric School Buses" – *EPA Joint Office of Energy & Transportation* (04/19/2023)
3. "School official laments electric buses cost '5X more' and are riddled with 'performance issues'" – Heather Hamilton, *Washington Examiner* (05/29/2023)
4. "Cold Weather Effects on Electric Bus Range" – *The Center for Transportation and the Environment* (11/2023)
5. "In Chicago, adapting electric buses to winter's challenges" – Tom Krisher, *AP News* (03/04/2023)
6. "Impact of Climate on the Range of Electric Vehicles" – *Power Integrations* (05/16/2023)
7. "Electric school buses are giving kids a cleaner, but costlier, ride to class" – John Rosevear, *CNBC* (12/10/2022)
8. "The $200 billion electric school bus bust" – Duggan Flanakin, *Real Clear Energy* (05/29/2023)
9. "Bad News About Electric School Buses" – Mitch Kokai, *John Locke Foundation* (05/25/2023)
10. "EPA Requirement Keeps Buses out of Low-Income Schools" – Jo Borras, *CleanTechnica* (01/16/2023)
11. "Staggering results in first year of Clean School Bus funding" – Brian Richesson, *LPGas Magazine* (01/11/2023)
12. "Metro's First Electric Bus Delivery Delay Due to Battery Fire Recall – Jordan Pascale, *DCist* (03/10/2023)
13. "Of EVs and Heat Waves" – Holman W. Jenkins Jr., *Wall Street Journal* (07/18/2023)
14. "The Underbelly of Electric Vehicles" – Aaron Steckelberg, Washington Post (04/27/2023)

https://buffalonews.com/opinion/letters/letter-public-funds-are-better-spent-on-more-propane-school-buses/article_728d5924-c574-11ec-a78f-179880a76e87.html

Letter: Public funds are better spent on more propane school buses

Apr 26, 2022

We agree with the editorial board that the price of inaction with regard to a warming climate could be dire. But we also believe there is a more cost-effective way to address this issue than electric school buses – and that answer is propane.

Gov. Kathy Hochul's decision to focus on electric buses is curious, considering all the factors involved. Propane buses are already here. Of the 22,000 propane buses transporting 1.3 million kids to school across 48 states, nearly 700 are in New York State.

So, it would seem the state's commitment to propane buses is already present. Why? For one, the answer is cost. Three propane buses can be purchased for every one electric bus, taking more dirty diesel buses off state roads faster.

Then there are the environmental factors. Just like electric buses, propane buses eliminate the harmful black smoke that comes out of a diesel tailpipe that you probably remember from your youth. But there's more.

People are also reading...

1 **New scoreboard among projects Buffalo Sabres are planning for 2024-25 season in KeyBank Center**

2 **Observations: Josh Allen's lone series g win over Bears**

3 **West Seneca eminent domain would take nearly half of resident's property**

4 **Former Nardin president files lawsuit, claims 'hatred, vitriol' and more by past and current leaders**

Electricity in New York is primarily produced by natural gas-fired generators. Battery electric buses don't eliminate emissions; they simply move those emissions upstream to power plants, which are typically in or near vulnerable communities. At the same time, propane buses take the pressure off our fragile electric grid, and there are no concerns about eventual battery disposal.

At 400 miles, propane buses also have four times longer range than electric buses, helpful especially for after-school activities. And, refueling takes minutes, as opposed to hours for recharging. Propane is also an exclusively domestic fuel – 90% is generated here in the U.S., with another 7% from Canada.

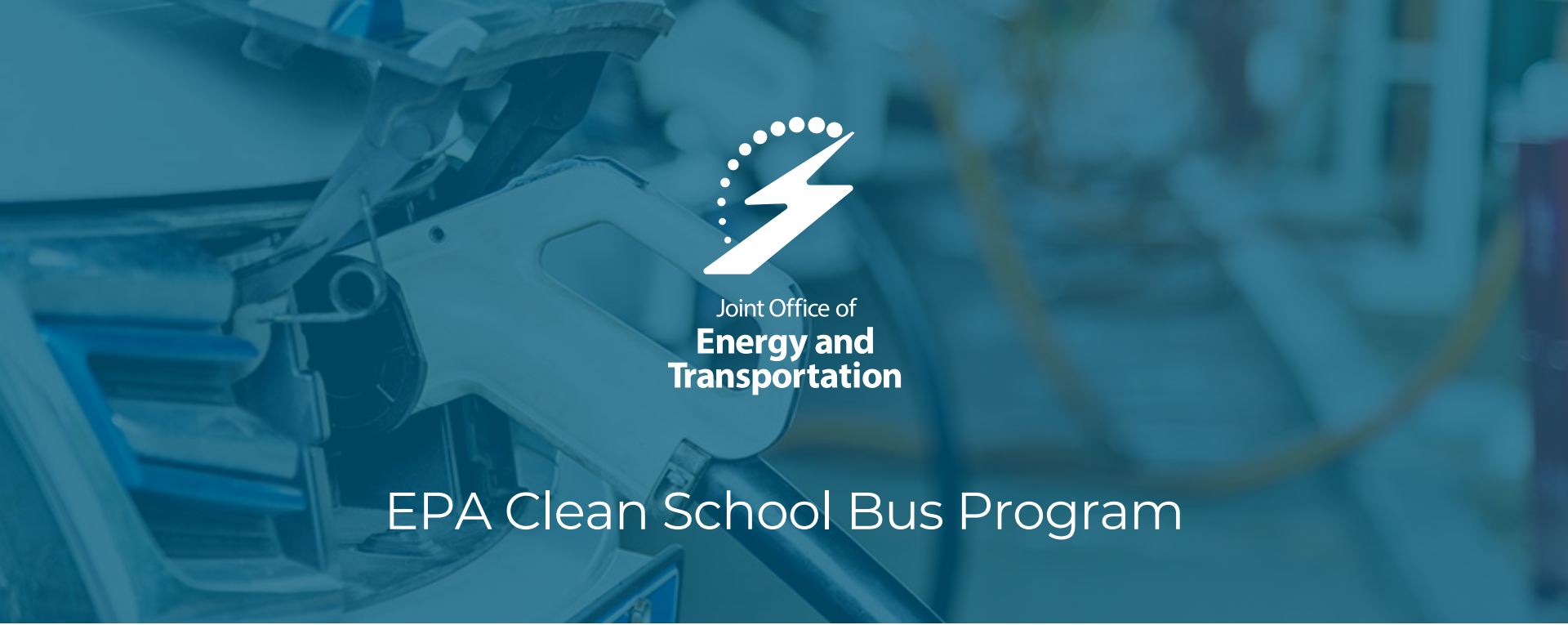
In short, we recommend Buffalo, and the state, take a hard look at propane school buses because they are the most convenient and cost-effective means to craft New York's clean future.

Tucker Perkins

President and CEO

Propane Education & Research Council

Washington, D.C.



Joint Office of
Energy and
Transportation

EPA Clean School Bus Program

Cold Weather Considerations for Electric School Buses

April 19, 2023

driveelectric.gov

Basics: Electric School Bus (ESB) Cold Weather Operation

- ESB high-voltage (HV) batteries operate most efficiently around 70°F, making temperature regulation a critical consideration.
  - HV battery temperature is regulated by a battery thermal management system (BTMS).
- An electric on-board cabin heater is the largest load on HV batteries outside of propulsion.
- HV battery charging and discharging generates heat.
- HV batteries are generally at an optimal charging temperature after returning from routes.
  - If parked for long periods in the cold, the charger will need to utilize a portion of the power to regulate the HV battery temperature.

ESB Cold Weather Best Practices

Pre-condition the bus prior to each route

- Regulates the HV battery and cabin temperature while the bus is plugged in to the charger
- Conserves HV battery for on-route energy
- Can be done during driver's pre-trip routine

Turn off or lower cabin heat when students exit the bus

- Conserves HV battery and extends range
- Consider heated driver's seats during procurement

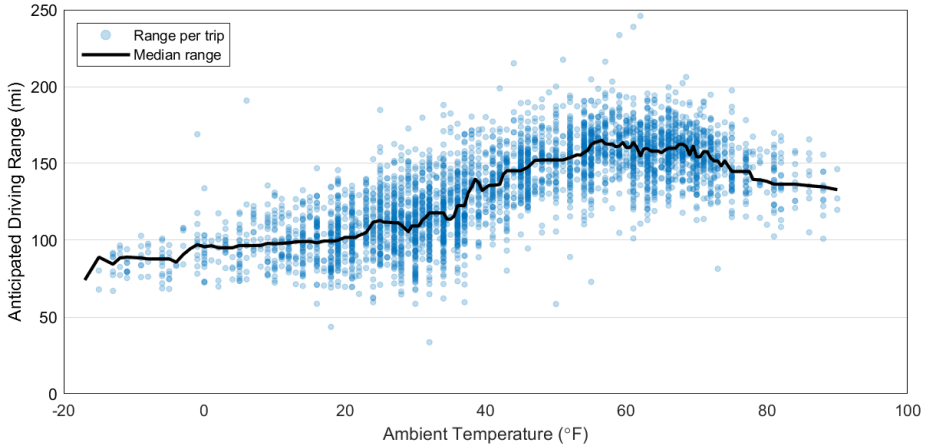
If possible, charge indoors in a temperature-controlled environment.

- Will reduce power needed to regulate temperature
- Will improve heater efficiency

Real World Cold Weather Examples: ESB and Battery Electric Bus (BEB) Fleets

Duluth Transit Authority – Duluth, MN

- 2019-21 study saw a range decrease of approximately 33% for a temperature decrease of 30°F. (https://www.nrel.gov/docs/fy22osti/83038.pdf)
- BEBs are approximately 3x as energy efficient as the diesel fleet
- BEBs utilize auxiliary cabin heaters in colder weather.



Tok Transportation – Tok, AK

- Has operated one Type C ESB since 2020 with only electric heat.
- Successfully completing routes under -35° F
- Experiences an efficiency decrease of 20-25% for every temperature decrease of 30°F, which maxes out around 55% efficiency decrease at negative 10-20°F.
- Bus is stored and charged inside.
- Utilizes 25kW DC fast charger.

Additional Considerations for Mitigating Cold Weather Impacts

Consult similar ESB fleets on their experience

- Climate, bus size, battery size, route distances, storage location, etc. will all affect cold weather operations. It is important to know what ESB fleets with similar use cases are experiencing to make the right decisions.

Consider larger HV battery options

- Evaluate worst-case cold weather when doing route analysis

Consider auxiliary heaters in extreme cases

- Available on most ESB models
- Negatively impacts emission reduction goals

Cold Weather Concerns?

Contact cleanschoolbusTA@nrel.gov for assistance with:

- Evaluating specific cold weather concerns and options
- Completing route analysis
- Incorporating utility or infrastructure considerations
- Connecting with local fleets or Clean Cities Coalitions
- More information on ESB and BEB data logging studies and real-world examples.

Image: *Battery electric school bus in Massachusetts*
Photo by Brian Foulds /Concord-Carlisle Regional School District; NREL Image Gallery

School official laments electric buses cost ‘5X more’ and are riddled with ‘performance issues’

by Heather Hamilton, Trending News Editor
May 29, 2023 10:12 AM

One Michigan school official admitted his district’s move to using electric buses was less than the government has touted it to be.

Emile Lauzzana, the environmental sustainability director of Michigan’s fourth-largest school district, recently told the Ann Arbor Public Schools Board of Education that the district’s electric bus fleet has had “a lot of downtime and performance issues.”

“It’s been a tough 2 1/2 years with this program,” Lauzzana said.

“We’ve been learning a lot about this technology,” Lauzzana also said. “Electric buses are approximately five times more expensive than regular buses, and the electrical infrastructure, which was originally estimated to be only about $50,000, give or take, for those four buses ended up being more like $200,000."

Lauzzana explained the district attempted to utilize "Vehicle to Grid" interconnection, which helps push energy back to the grid when buses are not being used, but that the “technology was not working.”

“I will say that I have a number of colleagues in different states who are facing similar challenges,” he added, noting the differences between electric cars versus buses. “For the school bus market, it’s been challenging for us.”

Ann Arbor Public Schools reportedly purchased its electric buses with a state grant that was funded by Michigan’s portion of a Volkswagen environmental settlement.

Last year, the Biden administration announced $17 million in grants to fund zero-emission electric school buses.

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FOR IMMEDIATE RELEASE:

Cold Weather Effects on Electric Bus Range

Atlanta, GA, November 2019: The Center for Transportation and the Environment (CTE) with the Midwest Hydrogen Center of Excellence (MHCoE), Cleveland State University (CSU), and the Stark Area Regional Transit Authority (SARTA) have released a study evaluating the relationship between ambient temperature and fuel economy for zero-emission buses. This study builds upon previous efforts by incorporating daily-level data into the analysis, allowing the team to capture extreme temperature values that would be masked in an evaluation of monthly data.

All transit buses, regardless of fuel source, experience some loss of range in extreme weather. As transit agencies plan to replace their traditional diesel-fueled buses with zero emission buses, they will need to consider the effects of extreme weather on the new buses replacing their existing fleets. Andrew Thomas, Director of the MHCoE said "Transit agencies located in cold weather climates will need to consider the effects of winter on range when planning a transition to zero emission buses. Hydrogen fuel cell buses appears to offer cold weather ranges that will be most compatible with traditional route planning." This paper attempts to compare both battery electric and fuel cell electric buses' fuel economy in relation to varying temperature trends.

"As someone who has relied on a bus year round in an area of the country with very cold weather – I haven't forgotten standing outside in -30 degrees Fahrenheit last winter – it is important to me that we share these real-world range results of zero-emission buses under a wide range of temperature conditions to ensure that they are deployed successfully throughout the United States," said Alison Smyth, Engineering Consultant at CTE.

The Study Team collected data from eight transit agencies: four that deployed hydrogen fuel cell and four that deployed battery electric buses. The results of the analysis show that the loss in range during a temperature change from 50-60°F to 22-32°F was greater for battery electric

buses (37.8% decrease) than for fuel cell electric buses (23.1% decrease). Since battery electric buses typically have a smaller range than fuel cell electric buses even under optimal conditions, this is an important consideration for transit agencies that are seeking one for one bus replacements.

This study seeks to provide transit agencies with planning insights as they consider strategies for replacing existing fleets, and does not intend to recommend one technology over another. “As a transit agency operating in the Midwest it is our goal to provide the best service possible to our riders,” said Kirt Conrad, CEO of SARTA. “This includes being able to operate our fleet with the greatest efficiency possible. This study, and its findings, help to show that hydrogen fuel cells are a viable option for other transit agencies in addition to their success here in Stark County.”

This effort was funded under a National Fuel Cell Bus Program grant provided by the Federal Transit Administration.

ABOUT CTE

The Center for Transportation and the Environment is a 501(c)(3) nonprofit organization with a mission to improve the health of our climate and communities by bringing people together to develop and commercialize clean, efficient, and sustainable transportation technologies. CTE collaborates with federal, state, and local governments, fleets, and vehicle technology manufacturers to complete our mission. Learn more at www.cte.tv.

Impact of Climate on the Range of Electric Vehicles

05/16/2023

Electric Cars

Electric vehicles (EVs) are a key piece in many governments' plans to reduce carbon emissions. As more are deployed in a wider range of climates, we are learning about the effect of those climates on EVs. This blog will look at the impact of climate on EV performance, the issues that it can create and some solutions being deployed.

Ambient temperature effects range

While all vehicles are impacted by temperature, EVs are particularly vulnerable due to their battery-centric systems. Batteries work through a chemical reaction which slows down at lower temperatures, resulting in lower efficiency.

An even bigger problem is warmth. Without an internal combustion engine (ICE) to create heat, an EV draws power from the battery to warm the cabin. Cold temperatures mean windows fog up, requiring an electric defogger. Winter brings longer nights, resulting in headlights being used more. Cold tires and driving through snow and slush increase rolling resistance. Using the AC on hotter days pulls more power from the battery. Even the battery thermal management system has to work harder in temperature extremes. All of these contribute to higher power draws from the battery, leaving less power to propel the vehicle.

External temperature can have a dramatic impact on range

EV manufacturers only publish range data at nominal temperatures, but there have been a few studies that examine the impact of the climate on usable range.

A recent UK study of electric cars showed cold weather can reduce the range by up to 30%. A 2019 study from the American Automobile Association (AAA) in the US tested five car models at 20°F and found the range was cut by 12% without heating in the cabin and dropped further to 41% with heating.

Consumer Reports (CR) studied multiple short trips (2019) and also highway driving (2023). The short trip test showed a drop of 50% in range, attributed to repeatedly heating up the cabin. Highway driving showed a drop of 30 to 35% in range at an ambient of 16°F. Testing on a hot day of 95°F, resulted in a 4% drop without air conditioning and 17% drop in range when using AC.

These tests show that colder weather is more of a concern than warmer weather. Heating and cooling are the main culprits and range reductions of 30% in moderate cold and up to 50% in colder regions should be expected.

Challenges for public buses

Electric buses haul more weight and operate longer hours than electric passenger cars, making them a great case study on the weather challenges facing battery-powered vehicles.

Ideally buses are in use almost constantly throughout the day. Buses also have a larger demand for heating (or cooling) as each time a bus makes a stop, the doors open, acclimatized air is lost, and a new batch of air needs to be heated or cooled. And, while a full bus will benefit from the warmth of its passengers in the winter, during the summer they will place an extra strain on climate systems.

Let’s look at lessons learned from some case studies from cooler climate electric bus installations, as cold weather has a larger impact on EV than warm weather.

Extra charging stations

In Chicago, where daily winter temperatures are on average between 25°F and 35°F, with a lowest of -9°F in 2022, the Chicago Transport Authority (CTA) started experimenting with electric buses in 2014 and plan to have an all-electric fleet by 2040.

CTA has built fast-charging stations on both ends of the No. 66 bus route to plug into the bus rooftops. Drivers constantly monitor the batteries to prevent them from being depleted and risking the bus getting stranded.

On each 10-mile one-way trip on the No. 66 route, the electric buses lose about 8% of their battery energy. In the winter, they start with approximately 100 miles of range when fully charged, and drivers are required to charge as the buses get below 50%. That means a bus can run about six trips between charges. With enough chargers, the electric buses can run all routes.

Extra heaters

Not surprisingly, the CTA reports heating as the main battery drain. To combat this, older vehicles have small diesel engines added to provide additional heat for extreme weather, taking some of the load away from the battery. New buses on order have newer, more efficient heat pumps, so they won't need the extra heater.

Alternative planning

Juneau, Alaska is also planning to convert to 100% electric buses. The newer buses the city has on order have larger batteries and provide a 282-mile range, which is expected to drop to 182 miles during wintertime but still enough to cover all of the city's bus routes. The city plans to use its older electric buses, which have a more limited range, on commuter routes that only run during peak hours.

Technology improvements

Companies like Letanda, an electric bus manufacturer in Quebec, Canada, are developing buses specifically designed for cold climates. These buses feature lightweight aluminum construction, heated surfaces to reduce condensation, and underfloor heating to enhance passenger comfort while minimizing energy consumption.

Electric heat pumps are replacing traditional heaters not only in buildings but in large vehicles with up to four times the efficiency. Power Integrations offer AEC-Q100 qualified **InnoSwitch3-AQ** and **LinkSwitch-TN2Q** offline switcher IC products that allow simple and efficient design of power supplies for heat pumps.

Future Outlook

With cities like Oslo, Norway, planning to convert their entire public transport fleet to electric vehicles by the end of 2023, there is ample opportunity for innovation and growth in this sector. Although initial capital spending for the new buses and charging stations is large, the electric buses are much less expensive to operate, even with the extreme weather. For example, the CTA calculates it costs $2.01 per mile to run a 40-foot-long electric bus, compared to $3.08 for a diesel bus and $2.63 for a diesel-electric hybrid.

Transit authorities are also banking on the price of electric buses to come down significantly as more are sold. In the meantime, it is essential to understand and address climate related challenges to ensure a successful transition to a greener future. By focusing on solutions and embracing technological advancements, electric buses can become a reliable and eco-friendly mode of public transportation, regardless of the weather.

Power Integrations supports the development of electric buses with **SCALE EV** gate driver boards. The single-board solution for automotive traction inverters is both AEC-Q100 qualified and ASIL certified. It provides a full range of functional safety features, including active discharge, active short circuit function and pre-testing of short circuit detection.

SCALE EV boards are designed to meet very large creep and clearance distances, enabling designs to comply with requirements of reinforced isolation, saving months of development and qualification time. Watch **this video** to learn more.

Electric school buses are giving kids a cleaner, but costlier, ride to class

PUBLISHED SAT, DEC 10 20227:00 AM EST

John Rosevear

BEVERLY, Mass. — It's a gray November morning, and we're on board a long, yellow school bus.

The bus bounces over this Boston suburb's patched streets in a way that would be familiar to anyone who ever rode a bus to class. But the bus is quiet – and not just because there are no kids on board.

This school bus is electric.

Right now, only a tiny fraction of the roughly 480,000 school buses in America are battery-powered. Most still use gasoline or diesel engines, just as they have for decades. But thanks to fast-maturing electric-vehicle technology – and the new incentives available under the Bipartisan Infrastructure Law and the Inflation Reduction Act – electric school buses are set to become much more common over the next decade.

"It's like a big huge go-kart," said the bus driver on that November day, who's been driving school buses, mostly gas-powered, for over three decades. "When you accelerate, you move. When you stop accelerating, you stop. And you don't hear any sound."

"Driving a diesel bus is not like driving a go-kart," she said.

Greener pastures

Environmental activists have been working for years to try to replace diesel and gasoline school buses with new electric models. Until recently, they faced some big challenges: Only a couple of companies made fully electric school buses, prices were very high, and the need for new "refueling" and maintenance infrastructure to replace tried-and-true diesel proved too daunting for many school officials.

The $200 Billion Electric School Bus Bust

"I love electric school buses!" – Kamala Harris

By Duggan Flanakin
May 29, 2023

The Beatles once sang, "All you need is love." But will Kamala Harris' professed LOVE for electric school buses – plus the $1 billion in taxpayer subsidies she announced last October – be enough to usher in the new paradise?

Hmm. Let's do the math. The $1 billion in rebates pledged is to help purchase 2,500 electric school buses in some 391 school districts around the nation. But there are in fact about 500,000 school buses transporting children to and from school, to and from ball games and other events, nearly every school day.

By simple calculation, this suggests it will take a **$200 billion** investment just to replace existing school buses – which must be done, Kamala tells us, by the 2030 deadline or else CHILDREN WILL DIE.

Do factories, batteries, and other raw materials exist to build (or retrofit) 500,000 school buses – and every other vehicle in America today – by 2030? By 2050? Does that much money exist? Does that much electricity exist?

To be sure, the demand (from mostly leftist school boards) is out there. Nearly 2,000 school districts applied for the free money last year, pushing the demand SO HIGH "that the EPA had to double the amount of funding" from the initial pledge of $500 million." Should Kamala keep her

LIBERTY

Bad News About Electric School Buses

by Mitch Kokai
Senior Political Analyst, John Locke Foundation

May 25, 2023

Collin Anderson of the Washington Free Beacon reports major problems for Biden administration advocates of electric school buses.

> *Michigan's fourth-largest school district is having "significant" performance issues with its expensive electric buses, issues that come after the Biden administration spent $1 billion to "transform America's school bus fleet" with electric models.*
>
> *During an April 19 presentation to the Ann Arbor Public Schools Board of Education, the district's environmental sustainability director, Emile Lauzzana, highlighted a number of issues with the district's electric bus fleet. Those buses, Lauzzana said, have "a lot of downtime and performance issues" and aren't "fully on the road," despite the fact that they are "approximately five times more expensive than regular buses." The infrastructure upgrades required to use the buses, meanwhile, were "originally estimated to be only about $50,000" but "ended up being more like $200,000," according to Lauzzana. "I have a number of colleagues in different states who are facing similar challenges," the district official lamented. "For the school bus market, it's been challenging for us."*
>
> *Just months before Lauzzana's admission, President Joe Biden's Environmental Protection Agency announced it awarded nearly $1 billion in taxpayer funds to "transform America's school bus fleet" with "over 2,400 clean school buses that will accelerate the transition to zero emission vehicles." But problems with electric buses occurred long before the agency's announcement.*
>
> *Electric bus company Proterra, which the Biden administration has lauded as "pretty amazing," saw Philadelphia remove 25 of its buses from the roads in 2020 due to structural problems. Those buses cost the city $24 million. Another Southern California city waited months in 2021 to repair nearly a dozen buses from its electric fleet, more than a third of which were out of service at the time. Ann Arbor Public Schools' electric buses also use Proterra batteries and drivetrain technology.*

EPA Requirement Keeps Electric Buses Out Of Low-Income Schools

Low-income school districts don't always own their own school buses, which means they won't qualify for a grant to buy electric buses.

By Jo Borrás

Published January 16, 2023

As part of the sweeping Inflation Reduction Act of 2022, the Environmental Protection Agency (EPA) launched a new Clean School Bus Program that earmarked $5 billion to help school districts switch from traditional diesel to "clean energy" electric school buses — but one of the program's requirements is keeping those buses *out* of the low-income school districts that stand to benefit the most from them.

What's Going On Here?

In order to qualify for first round of funding from these EPA grants, school districts are being required to identify the specific diesel buses they'd be replacing with the new, clean buses. The problem there is that many low-income school districts don't own their own buses. And, because they rely on contractors or subsidized lease deals, they can't meet the scrappage requirement.

In an open letter sent to the EPA, 14 members of Congress from Illinois wrote that, "These schools, regardless of their interest in the program or commitment to improving air quality for their students, are barred from funding to decarbonize their fleets." In Chicago alone, that one requirement means that several Chicagoland school districts — a list that includes Proviso, Rich Township, Lindop, Prairie Hills, and Waukegan — won't be able to participate in the Clean School Bus Program.

One of the districts negatively impacted by the EPA's scrappage requirements is Rich Township HSD 227 on the south side. D227 contracts with a private company to bus its students, and would have to convince their contractor to scrap their buses — and that's something they may not be willing to do. D227 Superintendent Johnnie Thomas thinks it's unfair for districts like his to have to rely on an outside entity in order to even be able to apply for the federal funding. "With (bus driver) shortages, with Covid and things of that nature, we have very little leverage in negotiating costs of those services," Thomas said. "This was a prime opportunity

‘Staggering’ results in first year of Clean School Bus funding

January 11, 2023 By Brian Richesson

The U.S. Environmental Protection Agency’s (EPA) Clean School Bus Program offered nearly $1 billion in 2022 rebates to replace existing school buses with clean and zero-emission models. The awards went to about 400 school districts in all 50 states.

Photo courtesy of Roush CleanTech

The results, however, weren’t favorable to propane. Of the more than 2,500 buses benefiting from the program, 95 percent were for electric buses (2,448). The funding allowed for 109 propane buses and 16 on compressed natural gas.

The Clean School Bus Program could have placed as many as 29,000 propane school buses on the roads, writes Todd Mouw, executive vice president of Roush CleanTech, in a blog post. He cites the cost, operational and environmental benefits of propane buses compared to electric.

“If the goal is to get as many dirty diesel buses off the roads as possible, did we actually do that with this round of funding? The answer is clearly no,” he writes.

Erin Hatcher, senior vice president of communications and marketing at the Propane Education & Research Council, called the results “staggering” during the council’s November meeting and underscored how the industry must target audiences beyond propane country. She cited young parents influencing a school district’s bus-purchasing decisions as one group impacting the industry’s future.

The 2022 awards represent the first $1 billion of a five-year, $5 billion program created by federal infrastructure legislation. EPA plans to make available another $1 billion for clean school buses in fiscal year 2023.

Metro's First Electric Bus Delivery Delayed Due To Battery Fire Recall; DASH Buses Also Affected

Jordan Pascale

Metro is still waiting for its first electric buses — originally scheduled to arrive in February — because a bus fire in Connecticut has triggered a recall and is delaying the delivery. Four Alexandria DASH buses have also been pulled from their routes.

Last July, a 2021 New Flyer Xcelsior (XE) electric bus run by CTtransit became fully engulfed in flames after liquid coolant accumulated in a battery area, which led to an electrical short and fire. The bus had been charged, but would not start. Just before 4 a.m. the rear compartment started smoking in a maintenance area. Workers moved it outside and it erupted in flames around three hours later. Firefighters had trouble putting out the fire and it continued to smolder for two days. (Battery fires can be hard to put out, the NTSB says.)

The incident sent two maintenance workers to an area hospital where they were treated for smoke inhalation, according to Connecticut Public Radio.

The National Transportation Safety Board released before and after photos of the bus.

The National Transportation Safety Board released photos before and after the fire.National Transportation Safety Board

The recall was issued in mid-February after a second bus started smoking in January and investigators found liquid in two other buses. New Flyer says 220 buses in the field have been affected.

The company is working on a remedy but suggests owners inspect battery packs prior to use. If liquid is found, they say the bus should be parked outside and away from structures. New Flyer has given instructions that will allow "for the safe operation while we identify a full solution… in a timely manner"

WMATA had ordered two 60-foot versions of the bus that is also under a National Highway Traffic Safety Administration recall.

"Although the delivery of our two new New Flyer buses is delayed while a remedy for the current battery recall is developed, we remain committed to our sustainability efforts and plans to transition our fleet," Metro said in a statement, "including the installation of charging infrastructure and evaluation of buses from Nova Bus, which are expected to be delivered in 2024."

New Flyer says its electric buses have completed 20 million miles of service and are "engineered, manufactured, innovated, and rigorously tested to be among the safest vehicles in North America, and the most reliable form of public transit in communities," the company said in a statement. "We are confident that the efforts taken through this recall will continue to enhance our safety performance and deliver better outcomes for our customers and their riders."

The company did not have an estimated timeline of when Metro might get their buses delivered.

Meanwhile, the DASH bus system in Alexandria, Virginia, has four 60-foot versions of the bus and has taken them out of service until further notice.

"Of the fourteen battery electric buses currently in service, the four newest are affected by this recall," DASH Director of Planning and Marketing Martin Barna said in an email. "In response, DASH immediately removed the affected buses from service and is working closely with the manufacturer to implement a compliant inspection and monitoring program.

"DASH monitors vehicle performance daily to ensure that all buses are operating safely, efficiently, and effectively."

Barna says DASH has been pleased with its electric bus program and has only had "minor challenges coming from operable range, charging infrastructure, and excessive battery drain in the winter months due to heating the passenger areas."

In a letter to transit agencies, a New Flyer representative wrote, "I apologize for the impacts of this issue, but please know we are committed to ensuring a remedy in as

timely a manner as possible and ultimately ensuring you the safest and best quality vehicle," the company wrote.

The company said the recall is unacceptable but other manufacturers have issued similar recalls as"the industry continues to learn and adapt these new technologies."

Metro has ordered five Nova electric buses that are due before the end of the year. Five other New Flyer buses are also on order, but it's unclear if those will also face delays. Metro was supposed to have 12 electric buses in operation by the end of the year. The transit agency hopes to transition to a fully-electric fleet by 2045, a deadline that environmental groups say is too slow.

WMATA has said it is working through several issues with infrastructure, power supply, and acquiring vehicles that are in high demand.

Montgomery County's Ride On bus service, D.C.'s Circulator, and Alexandria's DASH have several Proterra electric buses that have not had similar issues.

Maricela Cordova of Montgomery County's transportation department says the county has had a positive experience with its first four Proterra buses and is ordering 10 Gillig electric buses before putting out a request for 100 electric buses.

"Mileage range is still the main critical challenge with battery electric buses as they provide limited ranges and about half of our Ride On service routes are longer than the range we can service with battery electric buses," Cordova said." We are working on our first hydrogen fuel cell project. Hydrogen-fueled buses are also electric and zero-emission vehicles and provide longer mileage ranges, so as we get more electric buses, we expect that the County's zero-emissions regional impact will be broader, and we'll be able to serve more communities with green vehicles."

Autoweek reports that there are 1529.9 fires per 100,000 sales for gasoline vehicles and 25.1 fires per 100,000 sales for electric vehicles, according to the Bureau of Transportation Statistics. EVFireSafe.com has identified 18 electric bus fires as of April 2022, including one in Frederick County, Maryland in 2016.

Lithium batteries have started on fire in cars, e-bikes, and scooters, like one that started on fire in downtown D.C. in 2019.

https://www.wsj.com/articles/of-evs-and-heat-waves-range-anxiety-tesla-emissions-climate-7baa0f7d

OPINION | BUSINESS WORLD

Of EVs and Heat Waves

To help with climate change, grind your Tesla into small particles and inject it into the atmosphere.

By Holman W. Jenkins, Jr. Follow

July 18, 2023 6:32 pm ET

Tesla electric vehicles charge at a station in Hawthorne, Calif., June 22. PHOTO: CAROLINE BREHMAN/ZUMA PRESS

A just-so story is making the rounds. Consumer range anxiety is the stumbling block to increased sales of electric vehicles and also the reason car makers have been reduced to rolling out plus-sized EVs with batteries so big they defeat the purpose of emissions reduction.

Range anxiety is indeed a hang-up for consumers as shown in surveys. But this doesn't even scratch the surface of what has gone wrong—one might say, insane—in our EV policies.

If the goal were to reduce emissions, the world would impose a carbon tax. Then what kind of EVs would we get? Not Teslas but hybrids like Toyota's Prius. "A wheelbarrow full of rare earths and lithium can power either one [battery-powered car] or over 90 hybrids, but, uh, that fact seems to be lost on policymakers," a California dealer recently emailed me.

His numbers apparently originate with Toyota, setting off a small donnybrook in the green lobbying community. The same battery minerals in one Tesla can theoretically supply 37 times as much emissions reduction when distributed over a fleet of Priuses.

This is a shock only to those who weren't paying attention. It certainly isn't lost on government. Chris Atkinson, the Ohio State University sustainable transportation guru whose slogan I've cited before—"the best use of a battery is in a hybrid"—was a key official in the Obama Energy Department.

Our policies don't exist to incentivize carbon reduction, they exist to lure affluent Americans to make space in their garages for oversized, luxurious EVs so Tesla can report a profit and so other automakers can rack up smaller losses on the "compliance" vehicles they create in obedience to government mandates.

Mining the required minerals produces emissions. Keeping the battery charged produces emissions. Only if a great deal of gasoline-based driving is displaced would there be net reduction in CO2. But who says any gasoline-based driving is being displaced? When government ladles out tax breaks for EVs, when wealthy consumers splurge on a car that burns electrons instead of gasoline, they simply leave more gasoline available for someone else to consume at a lower price.

This may be a secret to you, the public. It's not to economists.

In Joe Biden, alas, we have a president less likely than many to distinguish something that sounds good from something that actually does good. The press is not much better. Even when willing to acknowledge policy irrationality, it remains cloyingly committed to the electric car as a virtue signal.

EV policy fulfills only one criterion of policy sustainability—it transfers consumer and taxpayer wealth to special interests in ways that voters can be conned into supporting.

The problem here is the problem with any plan to subsidize our way to emissions reduction. Humans are perfectly capable of consuming both renewable and dirty energy in ever-growing quantities if the price is right. The emissions data prove as much. How to explain, along the way, the coevolution of the climate empty gesture with climate rhetoric that increasingly shouts the unfounded claim that climate change threatens human survival? I explain it this way: When it became clear nobody was going to do anything about climate change, it became safe to engage in hysterical rhetoric about climate change.

At the very outset of my career, a wise mentor said of the then-new climate issue, "So what?" By which he meant he couldn't see humanity giving up fossil fuels.

In my mind, I later amended this: By incorporating carbon taxes into its tax systems, global society might at least slow the rate of CO2 emissions while simultaneously improving the efficiency of its tax codes. It still seemed unlikely, but it wasn't clear why. After all, politicians enact plenty of taxes. Governments have been advised for decades to adopt consumption taxes as a way to fund their welfare states without destroying the possibility of growth.

But here we are. The composition of the atmosphere is changing thanks to human activities. Compiling an annual average temperature for the Earth may be about as meaningful as averaging the numbers in a phone book. Unusual periods of warm, cold, wet or dry weather can happen in any climate. But as long as the universe is made of matter and energy, we should expect some effect on Earth from altering the amount of CO2 in the atmosphere.

A perhaps apocryphal Edwardian statesman sent his newspapers to the cellar because, he said, only in 20 years would it be clear which news was important. Feel free to ignore every climate headline until one arrives saying humans have started injecting sulfate particles into the atmosphere to reduce the amount of sunlight falling on earth. Only then will somebody be doing something about climate change.

Appeared in the July 19, 2023, print edition as 'Of EVs and Heat Waves'.

About this article

The underbelly of electric vehicles

What goes into making EVs, where it comes from and at what human cost

By Aaron Steckelberg, Hannah Dormido, Ruby Mellen, Steven Rich and Cate Brown

Updated April 27 at 8:15 p.m.
Originally published April 27, 2023

981

While electric vehicles are essential to reducing carbon emissions, their production can exact a significant human and environmental cost. To run, EVs require six times the mineral input, by weight, of conventional vehicles, excluding steel and aluminum.

These minerals, including cobalt, nickel, lithium and manganese, are finite resources. And mining and processing them can be harmful for workers, their communities and the local environment.

EVs have already secured a prominent place on our roads: They account for more than 10 percent of new-car sales globally. Recent U.S. legislation and regulations are expected to further increase demand.

Projections show global EV sales surpassing gas-vehicle sales before 2040.

The trend is expected to greatly reduce emissions from transportation, which now represent 14 percent of the global total each year.

As the demand for EVs rises, so will the demand for the minerals inside their batteries.

Your EV might look like a normal sedan or SUV from the outside.

But underneath the floor of your car is an approximately 900-pound battery block containing materials that have been mined from the ground, sent around the world and put through complex chemical processing to fuel your ride from point A to point B.

That supply chain has a significant human and environmental toll.

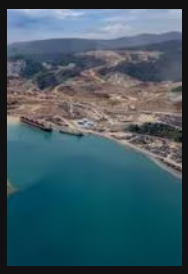
“If you are going to take a look at any source of energy, you always will have some trade-offs,” said Sergey Paltsev, a senior research scientist at MIT. “There is no magic solution.”

One of the most common batteries on the road, the NMC, used by companies including Volkswagen, Mercedes and Nissan, contains significant amounts of aluminum, nickel, cobalt, manganese and lithium.

But while batteries may vary in composition, they generally rely on the same set of materials.

CLEAN CARS, HIDDEN TOLL

A series unearthing the unintended consequences of securing the metals needed to build and power electric vehicles



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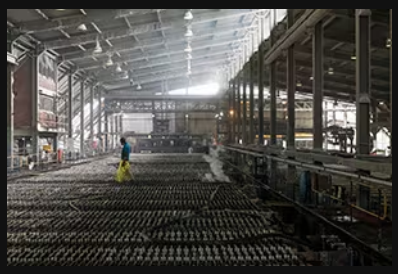


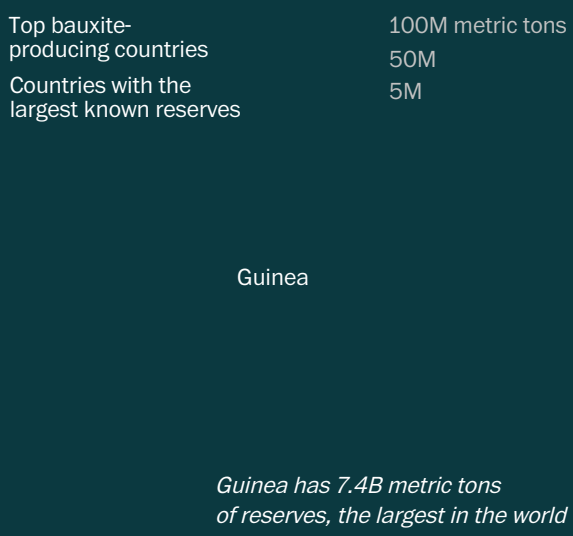
Imperiled workers

Boon for the T

Where the minerals are

The five minerals most critical to EV batteries are each concentrated in just a handful of countries. For these countries, the EV boom holds enormous economic promise, but also environmental, social and workplace challenges that have yet to be addressed.

Bauxite



Guinea has 7.4B metric tons of reserves, the largest in the world

PRODUCTION

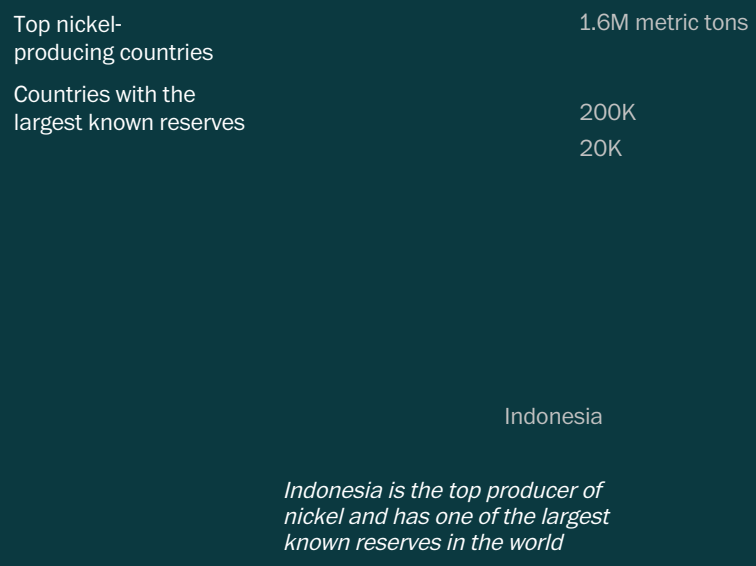
Bauxite, a reddish rock that is processed to produce aluminum, is mostly mined in Australia, China and Guinea. The lightweight metal enables EVs to travel

in Australia, China and Guinea. The lightweight metal enables EVs to travel farther without recharging than if they were made of steel. Aluminum is also one of the most essential minerals in EV batteries.

RESERVES

Guinea, one of the world's poorest countries, sits on Earth's largest bauxite reserves. By 2030, demand for aluminum will jump nearly 40 percent, to 119 million tons annually, industry analysts say. But the boom is taking a toll on the people who live on the land. Guinea's government says hundreds of square miles once used for farming have been acquired by mining companies for their operations and associated roads, railways and ports. Villagers have received little or no compensation, locals and rights activists say.

Nickel



Indonesia is the top producer of nickel and has one of the largest known reserves in the world

PRODUCTION

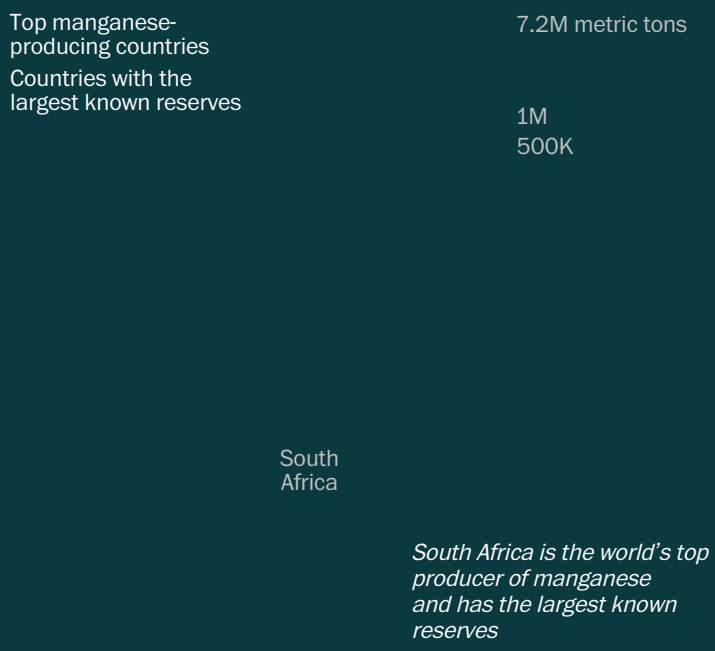
Indonesia is the world's top miner of nickel by a wide margin, and if trends continue, it will produce more than two-thirds of the global nickel supply by 2030. Global demand for nickel is expected to increase nearly 20-fold by 2040, and Indonesian officials have approved the construction of nine new nickel smelters in an attempt to capitalize on the boom — with tariffs and export bans to maximize profits at home.

But local communities are fearful of the effects of extraction and processing on their environment.

RESERVES

Sixty percent of the world's nickel reserves are concentrated in three countries: Indonesia, Australia and Brazil. China's proximity to the nickel-rich nations in the South Pacific has brought in foreign investment that will probably drive growth despite the environmental drawbacks.

Manganese



South Africa is the world's top producer of manganese and has the largest known reserves

PRODUCTION

South Africa's mines produce more than one-third of the world's manganese supply, and analysts predict that global demand from the battery sector will increase ninefold over the next decade as EV suppliers use high-purity manganese to increase battery efficiency and reduce combustibility.

Workers in these mines say they have experienced memory loss, slurred speech and other physical impairments tied to ingesting the mineral's fine dust.

RESERVES

South Africa also sits on the world's largest reserves of manganese. Ukraine has the fourth-largest known reserves. One manganese basin rests in the country's south, which Russia continues to bombard in its invasion.

Lithium

Afghanistan's lithium reserves may rival the current largest known reserves in South America

PRODUCTION

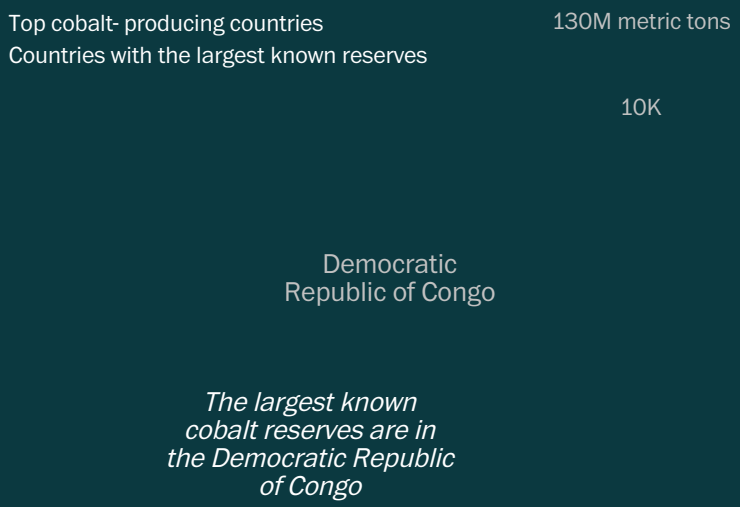
Lithium's reactivity and lightness enable EVs to generate the same energy and speed as gas-powered vehicles. Demand for lithium is expected to increase 40-fold by 2040, with 80 percent of that demand driven by EVs, according to the Natural Resources Defense Council. Australia, Chile and China lead in lithium mining.

RESERVES

Three of the largest current reserves are concentrated in South America's "lithium triangle," where arid salt flats in Argentina, Bolivia and Chile make it easy to extract lithium by simply evaporating the basins' brine water. Increased lithium demand threatens to exhaust the region's limited water supply, displacing Indigenous communities and disrupting the fragile ecology.

There may soon be another supplier. Afghanistan holds untapped lithium that may rival the world's largest known reserves. China has expressed interest in working with the Taliban government to tap those reserves.

Cobalt



The largest known cobalt reserves are in the Democratic Republic of Congo

PRODUCTION

Demand for cobalt is expected to increase 20-fold by 2040.

Seventy percent of the world's cobalt is mined in the Democratic Republic of Congo. State-owned and Chinese mining companies dominate the sector. But 15 percent of Congo's mining operations are in the informal sector, with more than 200,000 people working in unregulated and poorly ventilated mines.

The U.S. Labor Department estimates that between 5,000 and 35,000 children, some as young as 6, work in these unregulated operations.

RESERVES

Congo is also sitting on the world's largest reserves. As demand for cobalt rises, activists are calling for better monitoring and regulation.

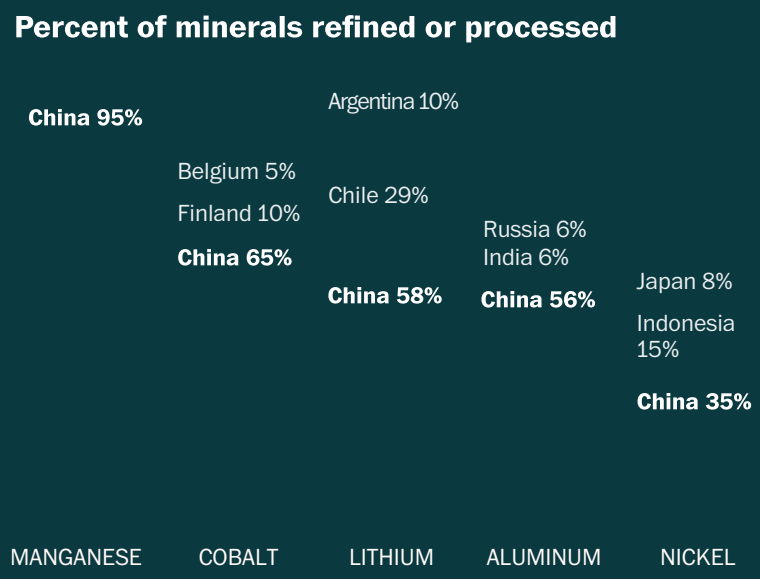
"Any truly ethical response to this problem would not support disengagement from [Congo] or involve the boycotts of its cobalt," wrote Mark Dummet, the

head of business and human rights at Amnesty International. "Instead, what we, as activists, consumers, auto makers, mining companies and governments alike need to be pushing for are practical solutions that place human rights at the heart of the energy transition."

China's grip on the supply chain

Taking the minerals out of the ground is only the first step. The ore is almost never pure and needs to be refined, or processed, to become the minerals that go into batteries.

When it comes to processing, there is one major player: China, which handles more than half of the minerals critical to EV batteries. These elements aren't used only to power EVs; they also appear in everything from building materials to toys. But as the demand for EV components soars, so could dependency on China's refining infrastructure.



The United States is trying to expand its supply chain. The 2022 Inflation Reduction Act offers a tax credit of up to $7,500 to consumers under certain income levels who buy qualifying EVs. But beginning in 2025, an EV that contains any minerals sourced or processed in China would not qualify for the full credit. This poses a problem for cost-conscious consumers, as Beijing

controls the lion's share of the world's processing infrastructure, and 75 percent of the world's battery production capacity, according to the International Energy Agency.

In the short term, EV buyers may have trouble securing the tax credits designed to incentivize a clean-energy transition. But over time, such policies could help diversify the EV supply chain.

"We still are going to be dependent on China for many, many years," Paltsev said.

CORRECTION

In an earlier version of this article, the Portugal symbol was misplaced on a map of lithium reserves and top-producing countries. The map has been corrected.

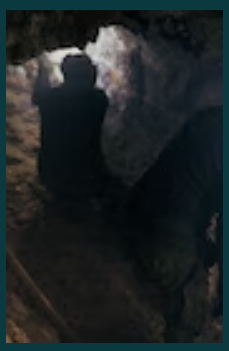
Clean cars, hidden toll

The hidden costs of your electric vehicle

April 27, 2023

Despite reforms, workers face danger to mine EV metals in Congo

Aug. 4, 2023



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Taliban and its n

July 20, 2023

About this story

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Clean cars, hidden toll

As the global demand for electric cars begins to outpace the demand for gas-powered cars, Washington Post reporters set out to investigate the unintended consequences of a global EV boom. This series explores the impact of securing the minerals needed to build and power electric vehicles on local communities, workers and the environment.

Methodology

Post reporters collected and analyzed data from the U.S. Geological Survey, the International Energy Agency, Bloomberg, the Princeton Zero Lab and the European Federation for Transport and Environment to piece together a comprehensive look at globally critical mineral supplies and the demands of the EV market.

Building on this data, reporters spoke with miners, lawyers, industry specialists and local activists in some of the countries most impacted to better understand how the demand for minerals will affect the environment and people's livelihoods.

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By Ruby Mellen

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By Cate Brown

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