Jenna Kay

From: Thilo Kluth <tkluth@mitchell-bros.com>
Sent: Wednesday, August 21, 2024 9:09 AM
To: Jenna Kay
Subject: Charging Infrastructure Report
Attachments: doc03329020240821090755.pdf; doc03329120240821090817.pdf

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Jenna,

I thought this might be of interest for the group.

Thanks,

Thilo Kluth
General Manager
Mitchell Bros. Truck Line
600 SE Maritime Ave. #100 Bldg #3
Vancouver, Wa. 98661
360-693-7477 xt 240
tkluth@mitchell-bros.com

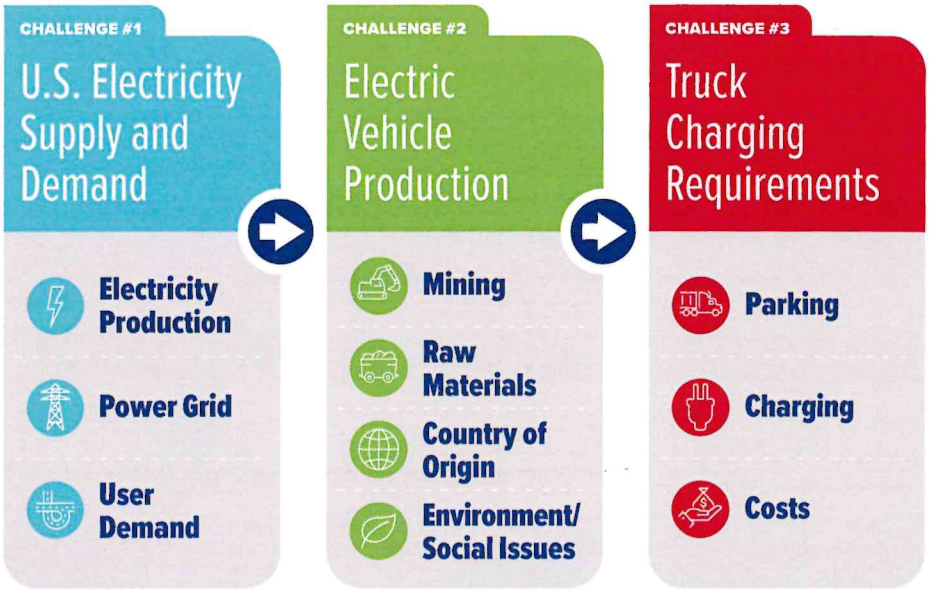
NEW REPORT!

ATRI American Transportation Research Institute

Charging Infrastructure Challenges for the U.S. Electric Vehicle Fleet

New research from the American Transportation Research Institute (ATRI) provides an assessment of the infrastructure needs for electrification of the U.S. vehicle fleet, with an emphasis on the trucking industry. This analysis focuses on three infrastructure components that may prove challenging for electrifying the nation's vehicle fleet:

1. **U.S. Electricity Supply and Demand**
2. **Electric Vehicle Production**
3. **Truck Charging Requirements**



ATRI's research identified key findings in each of these three infrastructure components.

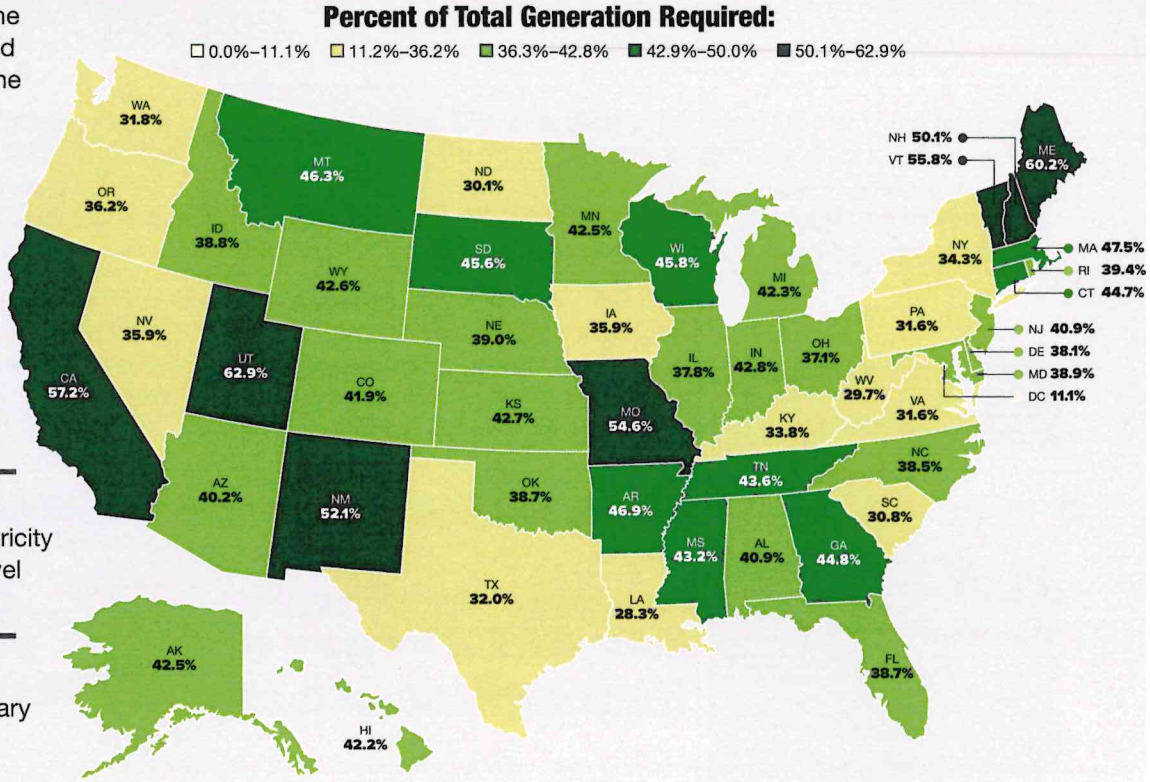
ELECTRICITY NEEDS ARE SIGNIFICANT

Full electrification of the U.S. vehicle fleet would require a large percentage of the country's existing electricity generation including:

- 26.3 percent for passenger cars and trucks
- 14 percent for all freight trucks, including 10.6 percent for long-haul trucks
- 40.3 percent for all vehicles

Some states would need more than 50 percent of current electricity generation to meet vehicle travel needs (see map at right).

Large-scale infrastructure investment would be a necessary precursor to electrification.



Key Findings

Continued

BATTERY MATERIALS DOMINATE BATTERY ELECTRIC VEHICLE (BEV) VIABILITY

Tens of millions of tons of cobalt, graphite, lithium and nickel will be needed to replace the existing U.S. vehicle fleet, placing high demand on raw materials.

Depending on the material, this represents:

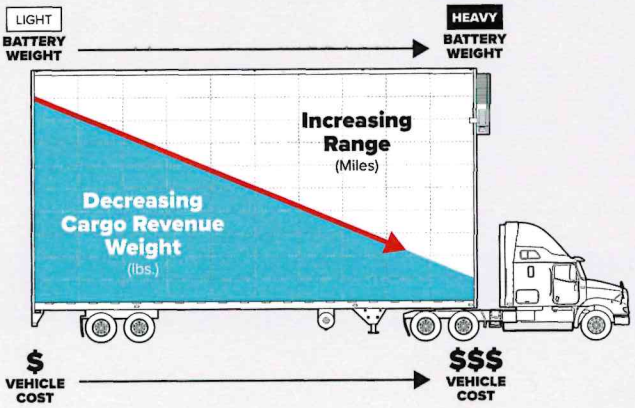
- 6.3 to 34.9 years of current global production.
- 8.4 to 64.4 percent of global reserves.

BEV production has considerable environmental and social impacts:

- Mining and processing produce considerable CO_2 and pollution issues.
- In some operations, a minimum of one million gallons of water must be utilized to produce a single pound of lithium.
- Exploitation of labor is common in some source countries.

BEV TRUCK CONUNDRUM

Battery weight increases price and vehicle range, but decreases cargo revenue weight. Ultimately more BEV trucks will be needed on already congested roadways to haul the same amount of freight.



TRUCK CHARGING AVAILABILITY WILL BE THE TRUCK PARKING CRISIS 2.0

Using today's truck and charging requirements, more chargers will be needed than there are parking spaces.

Regardless of advances in battery capacity or charge rates, BEV charging will be limited by federal Hours-of-Service rules for drivers and parking availability.

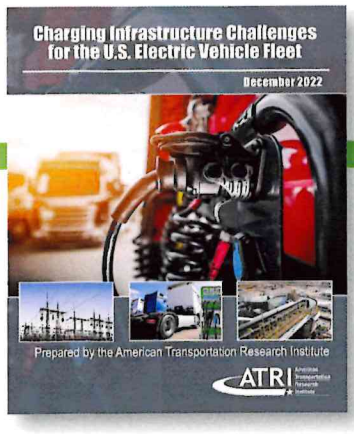
Initial equipment and installation costs at the nation's truck parking locations will top $35 billion, based on average per-unit purchase and installation costs of $112,000.

Additionally, to understand the truck parking challenges, ATRI quantified the truck charging needs at a single rural rest area, which would require enough daily electricity to power more than 5,000 U.S. households.

Other barriers include laws preventing commercial charging at public rest areas and the remoteness of many truck parking locations.

In the near term there are discrete applications for BEV trucks. Local and regional truck operations that rely on shorter trips and return the truck to terminals for nightly charging are feasible today. In the absence of public policies that mandate the purchase of these BEVs, carriers themselves will have to decide if the costs and benefits of a BEV truck fit well with their business models. And those decisions will be conditioned on truck costs, shipper/freight requirements, and access to abundant and inexpensive electricity. Issues arise however if any one or more of these decision-making inputs is not viable.

Producing BEV trucks that meet carriers' operational requirements, including impacts on operations and balance sheets and providing ample charging, must be addressed by the entire supply chain. Utilities must ensure that expanded electrification is feasible as well. It is inappropriate, however, to place these burdens squarely on motor carriers.



For a copy of the full report, please visit ATRI's website at TruckingResearch.org

ATRI American Transportation Research Institute