



November 30, 2021

State of Wyoming
Attn: Cori Schrinar
5300 Bishop Blvd.
Cheyenne, WY 82009

RE: RFI 22-011CS, Zero Emission Vehicle Infrastructure Program

Dear review committee,

National Car Charging is pleased to present this response to your RFI for a Zero Emission Vehicle Infrastructure Program.

Our company is the largest independent distributor of EV charging equipment in the United States and our headquarters are only 100 miles from the Wyoming border. Since our founding a decade ago, we have sold and installed over 6,400 charging ports in 45 states for over 800 customers. About 60% of our volume last year was with municipalities, states, and other public entities.

As the CEO of National Car Charging, I have the authority to bind the company to all of the representations made in this submission.

If you have any questions about this submission, please reach out to us. My direct line is (303) 437-4947 and my email is jburness@nationalcarcharging.com.

Regards,

A handwritten signature in blue ink, appearing to read "Jim Burness".

Jim Burness
CEO/GM
National Car Charging LLC

1A. National Car Charging Information

- Legal name: National Car Charging LLC
Main office: 209 Kalamath St., Ste. 4, Denver, CO 80223
Toll free: (866) 996-6387
Website: www.nationalcarcharging.com

1B. Vendor Background & Work Experience

NCC is one of the largest independent specialty distributors of EV charging equipment in the United States, having sold/installed almost 6,500 ports across 45 states for over 800 clients.



Some of our public entity clients include:

- City and County of Broomfield, CO
- City and County of Denver
- City and County of Honolulu
- City of Arvada, CO
- City of Aspen, CO
- City of Aurora, CO
- City of Avondale, AZ
- City of Boulder, CO
- City of Bridgeport, CT
- City of Brighton, CO
- City of Chandler, AZ
- City of Clinton, UT
- City of Colorado Springs, CO
- City of Concord, NC
- City of Coralville, IA
- City of Cortez, CO
- City of Creede, CO
- City of DeWitt, IA
- City of Dubuque, IA
- City of Durango, CO
- City of Durham, NC
- City of Flagstaff, AZ
- City of Fort Collins, CO
- City of Gastonia, NC
- City of Glenwood Springs, CO
- City of Golden, CO
- City of Grand Junction, CO
- City of Grand Rapids, MI
- City of Hanford, CA
- City of Healdsburg, CA
- City of Iowa City, IA
- City of Lakewood, CO

- City of Carson, CA
- City of Louisville, CO
- City of Minneapolis, MN
- City of Orem, UT
- City of Parkland, FL
- City of Redding, CA
- City of Rushville, IN
- City of Salt Lake City, UT
- City of Sandy, UT
- City of Santa Clara, CA
- City of Scottsdale, AZ
- City of Sedona, AZ
- City of Steamboat Springs, CO
- City of Tempe, AZ
- City of West Jordan, UT
- City of West Union, IA
- City of Westminster, CO
- State of Colorado Department of Agriculture
- State of Colorado Department of Law
- State of Colorado Department of Public Health and Environment
- State of Colorado Department of Transportation
- State of Colorado Department of Natural Resources
- Utah Department of Transportation
- Town of Bedford, NY
- Town of Breckenridge, CO
- Town of Buena Vista, CO
- Town of Crested Butte, CO
- Town of East Hartford, CT
- Town of Erie, CO
- Town of Estes Park, CO
- Town of Glastonbury, CT
- Town of Jackson, WY
- Town of Mancos, CO
- Town of Morrison, CO
- Town of Mountain Village, CO
- Town of Nederland, CO
- Town of Plymouth, MA
- Town of Rico, CO
- Town of Silt, CO
- Town of Superior, CO
- Township of O'Hara, PA
- Southeast Colorado Enterprise Development
- Adams County, CO
- Boulder County, CO
- Contra Costa County, CA
- Davis County, UT
- Eagle County, CO
- Jackson County, MI
- Jefferson County, CO
- Jones County, NC
- Napa County Office of Education
- Person County, NC
- Salt Lake County, UT
- San Miguel County, CO
- Summit County, CO
- Weber County Library, UT
- Ventura County Housing Authority
- Arizona State University
- Black Hills State University, SD
- Carnegie Mellon University, PA
- Central Piedmont Community College, NC
- Colorado College
- Colorado School of Mines
- Colorado State University
- Coast Community College, CA
- Davis Technical College, UT
- Dixie Technical College, UT
- Fort Lewis College, CO
- Hawaii Community College – Palamanui
- Kettering University, MI
- Otis College of Art & Design, CA
- Pacific Lutheran University, WA
- Salt Lake Community College
- Texas State University
- University of Colorado
- University of Denver
- University of Hawaii, Maui College
- University of Hawaii, Manoa
- University of Northern Colorado
- University of Pittsburgh
- Utah Valley University
- Windward Community College, HI
- Yosemite Community College, CA

2. Technical Response

1. Infrastructure Installation, Placement, and Operation

a. What considerations should be taken into account when developing DCFC or hydrogen refueling stations?

Like most industry analysts, we believe that the vast majority of vehicles in the near and mid-term future will be battery-electric with hydrogen being restricted to heavy duty vehicles such as over-the-road trucks and potentially aircraft. Even so, there will still be battery electric semis that will compete with hydrogen. Since the production of hydrogen is still largely reliant on fossil fuels, we feel the vast majority of the focus, and the biggest “bang for the buck,” is in supporting battery-electric vehicles.

When developing DCFC depots, we recommend that they be placed every 50 to 100 miles along major corridors, with multiple dispensers at each charging depot for both redundancy and to ensure drivers don't have to wait too long to recharge.

b. How does corridor development and funding help or hinder statewide infrastructure emplacement?

Level 2 charging is best for location with long dwell times, such as housing, office places, and in some cases, retail. DC Fast Charging, on the other hand, sees a variety of different audiences. One is drivers who live in housing that doesn't have charging. Another is ride share and delivery services. Yet another is the long-distance traveler. It is this last group who will be using EV charging the most in Wyoming in the near future.

Because of this, we recommend that the majority of the focus in this stage of planning be on corridor charging. Much of the Wyoming economy relies on tourism and it is also home to I-80, one of the most traveled shipping routes in the nation. By electrifying corridors first, the state is encouraging EV tourism, while at the same time providing critical support to those passing through, whether it is passenger cars or over-the-road carriers.

Additionally, studies have confirmed repeatedly that one of the biggest barriers to EV adoption is the perceived lack of EV charging infrastructure. If installed along corridors first, the high visibility of these installations will communicate to local drivers that the infrastructure is indeed ready.

c. How close or far from major travel routes should refueling and charging station be located?

The answer to this question depends on the local community in question. If the community itself is close to the corridor, then charging depots should be fairly close to the highway. On the other hand, if the community is a few miles off the highway (within about 3-5 miles), then locating the depot there is reasonable.

The bigger question is what amenities are available near the charging depot (more details in the next section).

d. Are there any additional environmental, safety, or other issues that must be addressed (parking, access, amenities, future expansion)?

Amenities play a very big role in the success of an EV charging installation. Since drivers are often charging for up to an hour or so, they need things to do while they wait. We often say the best charging installations have multiple dispensers, are well-lit and safe, have clean 24/7 restrooms, a place to get food and drinks, and good WiFi and strong cellular service.

e. As a REV West signee, Wyoming voluntarily agreed to mutual coordination of signage and other common infrastructure, are there any other considerations necessary outside of the REV West agreement?

While roaming agreements have been signed between the major network providers and some have already been implemented, it is worth putting at least some value in consistency of experience of the drivers. It would be inconvenient for a driver to be using one of the major networks in one state, only to find the state next door has chosen to deploy a little-known network they don't yet belong to, thereby having to sign up with a new network "on the fly."

The EV charging industry is understandably attracting a lot of attention, which is attracting new entrants all the time who try to make a splash with big promises. With many public entities being budget-conscious, they will often take a risk with these start-ups, only to find they can't deliver on their promises and end up with sub-par support. We feel it is vitally important to choose providers who are financially secure and have proven themselves over time.

Furthermore, it is important to assess what providers are best positioned to serve the drivers and station owners of Wyoming. A provider from the east coast with no formal service network would not be able to offer the same level of support as an established, national provider with nearby partners and service providers.

f. How can revenue be collected from users after refueling?

All of the EV networking providers offer ways to collect revenue from the drivers at the point of sale. It is critical, however, that the State allow station owners to charge drivers by the kilowatt-hour instead of being restricted to time-based charges or flat-rate charges, neither of which are equally fair to all drivers as kWh pricing is.

g. If the strategy is route or corridor based, what considerations should be given to prioritizing route or corridor buildout?

In the simplest terms, priorities should be assigned based on traffic counts, both for private vehicles and over-the-road carriers, followed by the most popular

tourism destinations.

h. What is the best way to address off corridor or route communities?

After the corridors are built out, we suggest the next focus be on multi-family housing followed by convenience/grocery stores and retail. Another focus could be schools as they often are a community hub.

i. The National Institute of Standards and Technology (NIST) publishes Handbook 44, Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices. Currently, Section 3.40, Electric Vehicle Fueling Systems – Tentative Code, has not been fully approved by the National Conference of Weights and Measures and is non-enforceable.

i. What is your familiarity with the development of the code?

Since we do business in California, we are somewhat familiar with the code. Overall, we are supportive of the code since the market is being flooded with cheap, untested hardware. It is becoming increasingly important to use standards like these to separate the quality products from those “not ready for prime time.” The NIST code is designed to protect consumers by communicating accurate information to drivers so they will know what to expect, both in terms of energy dispensed and the cost. “Ugly surprises” for drivers negatively impacts the EV driving experience and should be avoided whenever possible.

While not currently part of the NIST code, some states are considering mandating the use of magnetic-stripe credit card readers, which is a policy we strongly object to. Mag-stripe readers have proven to have a high failure rate in the field, especially in harsh elements, which is a problem for both station owners and drivers. Additionally, EV chargers are often in areas that aren’t frequently monitored, which makes them especially vulnerable to skimmers if equipped with a mag-stripe reader. Stations that use RFID-only do not have these reliability and identity theft issues (and banks are doing away with mag-stripes soon anyway).

ii. Are you manufacturing or installing charging equipment that complies with the current version of the tentative code?

Some of the manufacturers we represent already have interactive screens and some do not.

iii. Do you anticipate any difficulty supplying charging equipment that will meet the requirements of the National Type Evaluation Program administered by NCWM?

No, since our largest suppliers already comply.

j. In what ways can we posture aviation infrastructure to be ready for the integration of zero emissions aircraft?

The first place to start with aviation is the electrification of airport ground equipment, which can be done right away. Electric aircraft is still in the early stages of development, to the point where connection standards have not yet been established, however we do know that electric aircraft will require lots of power, so any new airport construction should plan for significant power draws.

We anticipate the development of eVTOL aircraft (“drones for human passengers”) to accelerate more quickly than the electrification of more traditional aircraft. These too will require high powered chargers, but exactly where and how these will operate is still undetermined.

2. Statutory and Policy Considerations

a. What current Wyoming statutes hinder infrastructure development? How should they be changed?

The #1 policy the State of Wyoming should adopt as soon as possible is the allowing EV charging pricing by the kilowatt-hour, which is most likely going to require a law to be passed by the legislature.

To date about 2/3 of the states allow for this and it has proven to make EV charging much easier than it is in states where it is prohibited. The main reason for this is that different cars charge at different speeds. For example, a Tesla will charge twice as fast on a 6.6kW Level 2 unit as a Chevy Volt. As a result, the Tesla owner gets twice as much energy in an hour as the Volt driver during the same period of time, which is inherently unfair. If both drivers are paying \$1.00 per hour, the Chevy driver is subsidizing the Tesla driver.

One other policy that can accelerate EV infrastructure buildout, but not without controversy, is allowing utilities to own and operate charging hardware. In Hawaii this has proven to be successful as the utility has stepped up to install DC fast chargers when the private sector has not. On the other hand, in Colorado the major IOU has taken a different approach and has gone into direct competition with the local EV charging providers, which inevitably will put the weaker companies out of business. As a result, we recommend that utilities be restricted to owning and operating DC hardware, leaving the Level 2 market to the private sector.

b. What state agency rules and regulations hinder infrastructure development? How should they be changed?

Unfortunately we are not familiar enough with Wyoming agency rules and regulations to comment on this.

c. What incentives should the state implement to encourage infrastructure development? What has worked best in other states?

Grants and rebates are by far the most common incentives used for EV charging

infrastructure across the nation because they can be managed (our outsourced) by local and state governments easily. More effective, but unusual for non-utility entities to offer, are subsidies and/or construction of the supporting infrastructure on the utility side of the meter.

Other incentives are utility rates specifically designed for EV charging. Furthermore, Low Carbon Fuel Standard credits (LCFS) are a powerful tool when priced correctly.

We elaborate on these in later questions.

d. Should the use of state lands be considered for infrastructure emplacement? Why or why not?

The answer to this question depends on the proximity of the state land to other charging options and what the intent is. If the goal is to provide recreational users with energy to get back home (such as a Level 2 charging station at a campsite), then the use of state lands should be encouraged.

On the other hand, if the intent is to use state lands to provide DC fast charging for corridor travelers, we would suggest giving the private sector a certain period of time (perhaps 24 months) to install EV charging systems before state land is considered.

e. What should be considered as “fair” road system maintenance taxation rates for zero emission vehicles?

Right now, the most common way EVs contribute to road maintenance is through an extra annual fee. In Colorado the fee is \$50, a portion of which goes to road maintenance and a portion of which goes to a fund for future EV charging incentives. Other states are less while some are more (to the point where it is punitive). We suggest that the annual EV fee be set as close to a vehicle owner would pay in taxes if they were driving an average number of miles annually using a vehicle with the median passenger car miles per gallon.

Eventually, however, we imagine most states will begin taxing all vehicles based on miles traveled (“VMT”). Right now there are a few pilot programs across the country, some using manual data collection and some using technology for remote data collection. Before long, however, as all new vehicles become connected, they will be able to easily share data if privacy concerns can be mitigated.

f. What are additional considerations for commercial vehicles?

Commercial vehicles should pay a higher annual fee, or VMT, based on weight since weight is the biggest factor in road degradation.

g. Are there climate change or carbon policy considerations?

Overall, any policy that encourages greater adoption of EVs will have a positive impact on the climate crisis.

3. Incentives

a. **Should corridor and local travel infrastructure incentives be handled differently? If so, how?**

Wyoming is in a somewhat unique situation in which the majority of EV charging in the near future is likely to be done by drivers passing through the state instead of full-time residents. Because of its location along major shipping routes, electrifying the highways of the state is critical to regional and even national EV adoption, especially in the heavy-duty truck sector. As a result, focusing on corridor charging is a very reasonable, and dare say, a necessary place to begin a structured strategy.

Approximately 66% of homes in Wyoming are single family detached houses, slightly higher than the 62% national average. It is our experience that single family homes tend to have lower barriers to installing charging than their multi-family counterparts, so we therefore suggest that the 34% of homes that are a multi-family environment be the focus after the travel corridors.

b. **What type and amount of financial incentives work best to encourage infrastructure installation?**

So far the most impactful incentives have been those from larger utilities in which the utility pays for (and usually installs) the underlying infrastructure that is so often the costliest portion of the project. This can include entirely new service, transformers, service panels, trenching, and more. To date we have not seen any state program that covers these costs as extensively.

Much more common at the state level are rebates or grants. The upside of a grant program, such as the one currently operating in Hawaii (\$4,500 for a dual networked Level 2 unit and \$35,000 for a new networked DC station), is that the station owners know exactly what their economics are going to be from the beginning of the project. The downside of grant programs is that there is often no oversight as to the quality of the project. For example, the question is never asked whether it going into a good location that will get used or not? Furthermore, simple grant programs like the one operated by Los Angeles Water and Power are ripe for fraud with unscrupulous vendors marking up cheap hardware 300% to 400% and pocketing the difference because the program has few requirements.

Alternatively states like Colorado have a competitive grant program. The Charge Ahead Colorado program offers the lower of \$9,000 or 80% of a dual networked Level 2 station or the lower of \$35,000 or 80% for a DC unit. It is a competitive grant and all applications are judged on their merits, which leads to higher quality projects. The downside, however, is that it is a lengthy and bureaucratic process and some projects just can't wait a third of a year to know whether their project will get funded or not (applicants are not allowed to take any action until they

know the fate of their application).

The ideal program would be somewhere in between these two, in which projects are not delayed unnecessarily, but also where funding is not distributed without some oversight and reporting expectations.

One common feature among many incentive programs is that only networked stations qualify. In exchange for the funding, site hosts are often expected to share usage data with the funding entity, which is a very reasonable exchange in our view. In addition, some programs (like Hawaii) insist on a multi-year warranty in order to ensure that projects are funded but are later found broken and unrepaired.

As for what amount is best, the answer unfortunately is “it depends.” We have seen programs that offer one amount for regular installations and a higher amount for installations in low-income census tracts. In general, however, \$5,000 to \$10,000 for a publicly-accessible networked Level 2 unit is a typical range, and \$35,000 to \$50,000 is common for a DC fast charger.

In addition to rebates and grants, one very successful incentive that is currently in place in California and Oregon is the Low Carbon Fuel Standard credit program. Station owners can earn credits based on use of Level 2 stations that can then be applied to future renewable energy expenditures. DC station owners benefit even more by having a guaranteed floor for the first five years. We’ve seen the presence of a LCFS program in California mean the difference between a financially viable DC fast charger and one that is not.

One policy question that should be addressed is whether third-party station owners are eligible for incentives or only site host owned stations. The challenge with third-party owned chargers is that their only source of income is the markup of electricity, which tends to lead to much higher costs for drivers. Site-host owned stations, however, can offer more competitive pricing to drivers since the site host is receiving other benefits of having a charging station, such as a higher spend in their store, etc.

c. Other than government financial assistance, what other incentives may be helpful?

One of the biggest barriers to creating a financially viable DC fast charger is utility demand charges, especially when charger usage is low in the beginning. Some utilities have realized this and have taken it upon themselves to create special EV charging tariffs that either employ a “demand charge holiday” program (such as Southern California Edison), or switch to a subscription model. Others, like HECO in Hawaii, at the behest of their PUC, have created an EV charging tariff that has no demand charge but a 15% premium on the usual kilowatt-hour price.

Our recommendation is for the Wyoming legislature or the Public Service Commission require the state’s utilities to develop special EV charging tariffs with low or no demand charges, at least for the first 10 years of operation.

One other successful policy we've seen across the nation is a pre-wiring requirement for new construction, both residential and commercial projects. Studies have shown that EV infrastructure retrofit costs are often 8x that of new construction.

d. If the strategy is route or corridor based, what is the best way to incentivize infrastructure installation in off-corridor communities?

Today 80% of all charging happens at home. While this is usually fairly convenient for single family homes, the real challenge is to make charging easy in multi-family communities, with smaller and older communities being an even bigger challenge. In addition to corridor charging for visitors passing through, we recommend the second focal point be incentives specifically designed for multi-family building owners.

The state could offer property tax credits for building owners who install EV charging, however Wyoming's relatively low property tax rate limits the effectiveness of this strategy. Instead, a rebate may be the best mechanism to encourage installation. We would recommend a rebate that declines over time in order to create a sense of urgency, rewarding the early adopters.

e. Are there climate change or carbon policy considerations?

Overall, any policy that encourages greater adoption of EVs will have a positive impact on the climate crisis.