Comments of the Vehicle-Grid Integration Council
on the Draft 2023 Colorado EV Plan

The Vehicle-Grid Integration Council (VGIC)[1] is a 501(c)(6) nonprofit trade association focused on accelerating the role of smart EV charging and discharging (i.e., vehicle-grid integration or "VGI") through policy development, education, outreach, and research. Scaling VGI is an essential part of transportation electrification and will help accomplish the following key policy goals:

- **Benefit drivers and fleet owners** by reducing the cost of ownership.
- **Decarbonize the transportation sector** by accelerating EV adoption.
- **Support decarbonization of the power sector** by providing essential grid services as renewable energy and distributed energy resource penetration increases.
- **Increase affordability** by reducing electricity bills for all customers.
- **Improve community resiliency** and security during planned and unplanned grid outages.
- **Foster economic activity** through innovation, competition, and market transformation.

With the proper policy and regulatory support and coordination, these goals can be achieved, and EV drivers and fleets in Colorado can play a critical role in the acceleration of both transportation electrification and grid decarbonization. **Our vision for VGI encompasses the following key elements:**

- **Ensure customer mobility needs are satisfied.** Drivers and fleets can participate in various VGI services without compromising their mobility needs.
- **Managed charging will benefit EV drivers and fleet operators**: Drivers and fleets in every state will be given the opportunity to align charging with the times of day when electricity prices are low, reducing operating costs by as much as 50% compared to unmanaged charging. Lowering the total ownership cost will accelerate overall EV adoption by drivers and fleet managers to meet Colorado's transportation decarbonization goals.
- **EVs offer community resilience benefits by providing emissions-free emergency power during blackouts**: During blackouts caused by extreme weather or other power outages, EVs can utilize bidirectional charging capabilities to send energy to a building or home (i.e., vehicle-to-building or V2B), serving as a generator and providing safe backup power for households and essential community services.

[1] VGIC member companies and supporters include American Honda Motor Co., Inc., Customized Energy Solutions, dcbel, Enel X North America, Inc., ENGIE NA, Fermata Energy, FlexCharging, FLO EV Charging, Ford Motor Company, FreeWire Technologies, Inc., General Motors, IoTecha, Kaluza, Kitu Systems, Nissan Group of North America, Nuvve Holding Corporation, Sacramento Municipal Utility District, Stellantis N.V., Sunrun, Switch EV Ltd, The Mobility House, Toyota Motor North America, Inc., Veloce Energy, Inc., Wallbox USA Inc., and WeaveGrid. The views expressed in these Comments are those of VGIC, and do not necessarily reflect the views of all individual VGIC member companies or supporters. (https://www.vgicouncil.org/)

- **Charging infrastructure dollars go further**: Smarter management of EV charging will help minimize investments in utility infrastructure to support economy-wide electrification, which reduces the overall cost burden on all electric utility customers, and avoids significant delays associated with upgrading distribution system infrastructure.
- **EVs provide valuable reliability services to the grid and get paid for it**: Unidirectional managed charging ("V1G") can provide demand response services and bidirectional vehicle-to-grid ("V2G") charging can enable EVs to feed power back to the grid to provide peak shaving and other ancillary services. Providing these services can unlock new revenue streams for EVs, lowering the total cost of ownership.

VGIC appreciates the opportunity to comment on the Colorado Energy Office's (CEO) Draft 2023 Colorado EV Plan. While the Draft Plan includes many ambitious and laudable goals and actions, advancing VGI would help deliver additional benefits to EV owners and the grid in Colorado, as discussed above. As an initial matter, given the importance and potential benefits of VGI, VGIC recommends that CEO identify advancing VGI as a goal as part of the EV Plan's "Cross-cutting" set of goals. VGIC also provides the following specific suggestions to help achieve this goal:

1. **Transportation electrification investments made through programs under the EV Plan should incentivize VGI capabilities where and when it makes sense.** VGI stands to offer substantial public benefits as EV deployment scales up. However, for these benefits to be fully realized, it is critical that VGI capabilities be considered and prioritized in infrastructure investment plan, rather than after-the-fact. VGIC recommends that CEO encourage VGI capabilities in EV charging infrastructure investments where and when it makes sense. For example, public access DC fast charging (DCFC) stations are unlikely to be well-suited for VGI in most instances (including both managed charging and V2X bidirectional charging). However, there may be significant opportunities to incorporate VGI capabilities at Level 1 and Level 2 charging locations with long dwell times as well as DCFC sites serving fleets. One overarching strategy to support VGI during – not after – the charger deployment phase is to provide a higher level of funding to be made available for bidirectional charging infrastructure. As referenced above, V2X bidirectional charging systems can support grid reliability and community resiliency. Today, V2X systems are DC-based where an inverter inside the EV charger converts the EV battery's DC power to AC power for use in buildings and the grid. When faced with the choice between a lower cost Level 2 or a bidirectional DCFC, customers often default to the less expensive Level 2 option. Thus, the incremental upfront costs of deploying and enabling V2X bidirectional charging today creates a barrier to realizing the significant public benefit that should be considered under the EV Plan.

   It is important to note that the incorporation of VGI solutions should include both charger-based VGI options and vehicle-based VGI options (i.e., leveraging on-board telematics). CEO should consider the potential benefits of leveraging both capabilities to enable VGI

use cases. VGIC believes both charging station and vehicle-based VGI solutions should be enabled through programs under the EV Plan.

2. **CEO should work with Colorado's utilities, including investor-owned utilities, rural electric cooperatives, and municipal utilities, to develop rates and programs that encourage VGI.** In order to unlock EV load flexibility (including both managed charging and V2X discharging), utilities must offer rates and programs that incentivize EV customers to shift charging to low-cost periods and export power to buildings or the grid during peak periods. This can be accomplished through time-of-use rates, dynamic (i.e., real-time) pricing, demand response, V2G export compensation, and other approaches. To maximize participation, each utility should have a suite of offerings to accommodate the wide range of EV customer types and use cases. Notably, V2G can serve as a core strategy for school bus electrification, as electric school buses are uniquely qualified to serve as a reliability and resiliency resource using commercially available bidirectional vehicles and EVSE, while unlocking additional revenues for school districts. As the state energy office, CEO should reach out and coordinate with the various utilities in the state to develop these rates and programs. Accordingly, VGIC recommends that CEO includes advancing utility VGI rates and programs as a key action under the EV Plan.

3. **CEO should prepare for the coming wave of commercially available VGI offerings by educating fleets, homeowners, workplaces, and other customer groups.** The anticipated rapid deployment of electrified transportation across the US requires considerable outreach and education to minimize infrastructure costs and maximize benefits to all ratepayers. In particular, education and outreach to fleets is critically needed to inform fleet managers of the potential value of fleet electrification. For many fleets, converting to electrified transportation is a significant undertaking that lies outside of their existing expertise. The Draft Plan appropriately identifies the importance of educating customers on vehicle electrification. However, given the potential complexity of VGI, more policy support is needed to direct funding toward educating fleets – as well as other customer types – not only of the benefits of electrification in general, but the enhanced value proposition that VGI technologies can offer. These value propositions include new potential revenue streams from grid services, reduced charging infrastructure costs, reduced charging energy costs, new bill management options, and enhanced resilience of critical facilities. The marketing, education, and outreach activities under the EV Plan should ensure fleets and other customer groups understand the opportunities and challenges of electrification, as well as their choices for implementing VGI strategies from the outset.

4. **VGIC supports making charging infrastructure as widely accessible as possible and ensuring quick energization timelines for unidirectional chargers and expedited interconnection procedures for bidirectional chargers. One promising solution towards this goal may be to allow and incentivize Automated Load Management**

(ALM) in public buildings, charging depots for commercial vehicles and fleets, and other publicly accessible and/or shared charging infrastructure that may benefit underserved and disadvantaged communities. Many low-income and disadvantaged communities are served by outdated utility infrastructure (substations, transformers) that may require significant and costly upgrades to be able to accommodate EV charging load and/or V2G exports. The use of ALM can help mitigate these infrastructure upgrade costs by reducing the collective peak load at one site, therefore making charging infrastructure more affordable for disadvantaged communities. ALM is a VGI solution that is particularly well-suited for multi-charger sites such as publicly accessible commercial buildings, shared fleet charging, workplace charging, multi-unit dwellings and other non-single family home sites, where low-income customers may be more likely to charge.

Specifically, ALM refers to the use of either 1) software-based approaches that share electrical capacity among EV supply equipment (EVSE), or 2) battery-integrated EVSE or co-located energy storage systems, to avoid or defer the need for additional electrical capacity and infrastructure on both the utility and customer side of the meter. VGIC believes that ALM can stretch charging infrastructure investments and ensure more chargers are installed in more places. We recommend the programs under the EV Plan promote the use of ALM to enable charger deployment at a site that may otherwise be cost-prohibitive or space-prohibitive due to potential utility distribution system upgrades. Optional ALM solutions should be encouraged and incentivized when they are shown to be comparatively cost efficient versus traditional utility system upgrades. VGIC advises against mandating ALM requirements on charging infrastructure, as this may result in inequities by limiting charging capability for customers. Instead, VGIC recommends ALM be allowed and incentivized (i.e., a "carrot" rather than "stick" approach) for so that deploying ALM solutions become a viable option for those that wish to deploy, such as fleet operators. VGIC recommends that an optional, technology-neutral ALM incentive be included in charging infrastructure programs under the EV Plan.

VGIC appreciates the opportunity to submit this feedback on the Draft 2023 Colorado EV Plan. We look forward to further collaboration with CEO and other agencies and stakeholders in Colorado on this important initiative.

Respectfully submitted,

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