Responses by the Hon. Daniel Simmons to Questions for the Record:

The Honorable Rick W. Allen:

1. **Mr. Simmons, you referenced a study in your testimony that the critical mineral input for a lithium-iron phosphate battery has increased by 393% from April 2021 to April 2022. Do you expect prices for critical minerals to continue to rise, thus increasing costs for solar energy, wind energy and electric vehicles?**

Answer:

It is incredibly difficult to estimate future prices of commodities. Increasing amounts of renewable technologies, along with electric vehicles and stationary batteries will dramatically increase the demand for critical minerals. Unless there is a massive increase in supply, prices will surely increase, and in order to massively increase supply, huge new investments will be necessary which will be reflected in price.

To have the most control over our economic future, it is critical that we increase the mining and processing of critical and other important minerals in the United States. This is certainly possible. A decade ago, people complained that we couldn't drill our way to more energy security, but we did just that. Today, the United States is in a much better position with respect to oil because we dramatically increased our oil production. We need to do the same with minerals.

2. **Could you elaborate on the impacts of the rush to produce electric vehicles and expand renewable energy on our electrical infrastructure system?**

Answer:

Over the last 100 years, piece by piece, we built the electric grid that powers the United States. The grid is incredibly complex. On the grid, supply and demand have to be balanced at all times or there will be blackouts or brownouts.

The grid was built around the idea of dispatchable power—sources of electricity that can be programmed on demand at the request of grid operators responsive to the demands of consumers. Wind and solar generation are fundamentally different because they are not dispatchable without batteries. It is a growing challenge for the electric grid as more non-dispatchable generation becomes attached to the grid.

Another challenge is that wind and solar resources are not located near population (and demand) centers. To facilitate the large-scale use of wind and solar technologies, we need much more electricity transmission than we currently have. To reach the Biden administration's goal of a zero-carbon grid by 2035, U.S. generation capacity would have to triple compared to its 2020 level and power line capacity would have to double or triple, according to a report from the National Renewable Energy Laboratory (NREL). Princeton University researchers, however, believe that grid capacity estimate maybe too low, requiring increases that are 2 to 5 times higher than today's levels by 2050.

A large increase in electricity transmission will increase the cost of running the electric grid. We are already seeing electricity rates increase even as we add a large amount of low-cost generation in the form of wind and solar. This is a concerning development.

The electric grid has evolved over 100 years. Moving too quickly to dramatically change the grid will result in high costs for consumers. We are already seeing electricity rates increase even when the cost of generation has decreased. This is a concerning trend that deserves more study to understand why rates are increasing.

The Honorable Russ Fulcher

1. **What are the national security benefits of buying local—producing critical minerals domestically or in allied countries with reliable partners?**

Answer:

There are certain critical minerals that are necessary for our natural security. For example, DOD needs certain critical minerals for high-tech electronics and for next-generation aircraft. The United States has many of these critical minerals, but the federal government limits access to minerals. For example, the Biden administration's Army Corp of Engineers recently revoked a Clean Water Act permit for the NewRange copper and nickel mine in Minnesota. Without access to minerals domestically, it is difficult to assure access to the necessary minerals needed for national security.

To mineral imports in perspective, at the peak of the U.S. oil dependency, we relied upon the nations of the Middle East for about 23% of our oil. China is the largest processor of copper, nickel, cobalt, lithium, and rare earths—processing between 35 percent and 85 percent of these minerals. This is not good for our national or energy security.