

GRU GM Response to Climate Action Committee questions

What are GRU's near-term and long-term plans to end reliance on natural gas, both as a primary fuel and as back-up for solar?

The operation of GRU's electric grid is based on balancing the load demand of our electric customers with the available electric output of our generation plants. In addition to matching a specific nominal load on a minute-by-minute basis, GRU is required to have electric reserve requirements for itself and the overall region. The utility works in a state-wide partnership sharing the operational risk and providing mitigation of outage contingencies.

At the heart of this electric system is the concept of reliability. Reliability is having the capacity and ability to supply every customer with their power demands each and every minute of the day. Based on the current available technology, GRU's system reliability is provided by carbon-based combustion power generation. GRU has coal, natural gas, fuel oil, landfill gas, and biomass at its disposal. Of these choices, natural gas is the cleanest, most efficient, and most reliable. GRU's generation portfolio is built on these generation assets. Other systems have nuclear, or hydro-power as a reliable alternative, but not GRU.

In order for GRU, or any other utility to end its reliance on natural gas, or any other fossil-fuel, it will need a reliable substitute. To be blunt, solar power is not reliable. At best, it is a supplementary source as defined by NERC (our governmental regulatory body). The reason is quite clear. Solar is intermittent, meaning it is subject to abrupt power cessation under cloud cover as well as nighttime conditions. In fact, so intermittent is solar power, that in Florida, the Sunshine State, solar panels are only capable of producing power at most 20% of the time. Solar is so unreliable that residents that install solar arrays almost always hook up to the electric grid as their backup source. In many cases, laws and codes require them to do so. The reason: solar, alone, is not a reliable source of power.

Ironically, the technology which best allows for more solar power generation in an electric grid is natural gas generation. The technology of choice right now is Reciprocating Internal Combustion Engines, or RICE units. These units can start quickly and ramp up much quicker than solid fuel loaded plants. The result: in today's technology, more solar can only be achieved with more natural gas generation to complete the reliability equation.

In order to make solar functional *and* end our reliance on natural gas, we will need to find a commercially viable energy storage source – in most cases batteries. In spite of advancements in battery capabilities, they are still unaffordable, nor operationally- stable enough to install and replace

GRU's natural gas reliance. As the GM of the Utility, I have no near-term plan to end reliance on natural gas. Instead, I have a near-term plan to end reliance on coal, which has been a primary source of power in GRU's territory for decades upon decades. This year, we converted the Deerhaven Coal Plant to be capable of operating with natural gas, or coal. I envision the plant to operate primarily on natural gas, which will dramatically reduce greenhouse gas emissions as compared to running on coal.

Long-term, I envision the progressive betterment of energy storage technology. However, a utility such as GRU is not a research and development company. We don't seek investors to speculate in how soon we can develop the next best energy storage capabilities. We are not technology setters, we are technology followers. Frankly, it's how a municipal utility should operate. Particularly, given GRU's not too long ago ill-fated venture into Solar Feed-in-Tariff contracts and Biomass PPA's.

What sort of incentives might GRU be willing to offer to shave peak demand?

While it's stated that shaving peak demand would reduce GRU costs that may be true in theory, but not in practice. 80 to 90% of GRU's cost are fixed. That means that, in many cases, reduction in kilowatts generated won't reduce costs by the same level. The other concern is GRU's generating fleet operates as a symphony of instruments which produce a harmonious sound. Shifting the melody may result in turning Beethoven's Fifth into his last. Depending on the exact times of peak demand reductions and whether they require changes in the units being dispatched, GRU's operating costs may not be reduced. Furthermore, GRU already sets aside almost \$500,000 annually in Low-income Energy efficiency program (LEEP) to provide home energy efficiency upgrades to low-income households.

How does GRU plan to deal with fossil fuel stranded assets in context of its net-zero commitment?

Near-term, I don't see that natural gas generation assets or natural gas transmission and distribution lines will be stranded assets. Long-term, in compliance with the net-zero commitment by 2045, most of these assets will have reached the end of their useful life. Any remaining unrecaptured costs will be borne by GRU customers. Currently, GRU customers are paying for the \$30 million plus cost of greenfielding of the old Gainesville Gas site, now known as Depot Park, the running tab of \$50 million in Solar FIT costs, and the \$600 million plus costs in buying out the biomass PPA. I suspect the fossil fuel stranded asset costs will not approach those combined levels.

Why is GRU continuing to promote and incentivize de-electrification? The context here is the net-zero commitment as well as robust evidence that natural gas is not an environmentally friendly fuel, especially when leaks are accounted for.

GRU continues to promote the economic and operational viability of the utility whose primary mission is to provide safe, reliable, competitively-priced utility services, in an environmentally-conscious manner, in accordance with community values. Here's how: the majority of natural gas rebates (88%) are extended to developers outside of GRU's electric territory. As a result, GRU is removing customers from another electric provider's territory (e.g. Clay Electric) whose renewable energy percentage may be the state average of 4%. In exchange, GRU is supplying natural gas at the source of its use (e.g. water heaters or stove), where it is dramatically more efficient than being converted to electricity in the power plant. Frankly, it's an easy solution for me. Without GRU's rebates to gain access to the developer's housing complex, these customers would be using more natural gas than if they were a direct supplied GRU natural gas customer.

If that weren't enough, the City of Gainesville benefits because GRU's natural gas department captures up to 500 new customers each year, and, with a two-year payback on the rebate, provide money to fund the general fund transfer to the city. It's a win-win-win, environmentally, financially to GRU, and financially to customers.

What options for non-fossil fuel storage is GRU considering for backing up solar (not natural gas)?

At the present time, we are unaware of any commercially viable non-fossil fuel energy storage that would have the ability to replace reliable generation. We have entered into the 50-megawatt Solar PPA with Origis whereby they are providing backup to that generation's daylight intermittency issues. The energy storage solution is not yet ripe, and given GRU's financial profile, it would be highly imprudent to layer on battery solutions that are costlier and unproven at the present time. I'm reminded of comments my kids made to me when we first got on the highway to start a trip. "Are we there yet," they would say. My reply was always, "No, but if you are patient, you will really enjoy the ride."

In regard to gravity storage, it is an interesting concept, however, it has not yet achieved commercial viability. For those that are unaware, it would involve 300 to 500 feet high structures 500 feet square. The amount of structures necessary, if commercially viable, would surround Gainesville with a possible 1,000 buildings.

This idea about land mass consumed by any of these energy solutions has yet to be discussed. Let me take a moment to talk about it. To fully supply GRU's customers with solar powered electricity, we'd need between 500 and 600 megawatts of solar capacity. Why so high? You need to charge batteries that can be discharged during the night. Of course, I've heard that electric vehicles (EV's) can power the homes at night. Okay, when will the EV's be charged? Of course, during the day, which will require more solar capacity.

Back to the land mass required for GRU's solar capacity. With or without natural gas backup, the land required to house 500 to 600 megawatts of solar capacity would approximate 4,000 acres. 4,000 acres is 6 1/4 square miles. Gainesville is 64 square miles. In order to supply Gainesville with solar power, it would require using 10% of the city land mass, without counting battery storage, or natural gas backup power plants. The worst part is that each 50 to 75 megawatt solar farm would require 400 to 700 acres. Houston, we have a problem.

Have Solar PPA's been considered as an option to add renewable to the fuel mix? How would Solar PPA's impact the need for back-up capacity? Why have Solar PPA's not been more aggressively pursued?

I've got to be honest here. How in the world could anyone on your committee ask GRU why they haven't been more aggressive with solar PPAs? GRU has over 20 megawatts of Solar FIT contracts, and, on top of that, executed a below-market PPA with Origis for another 50 megawatts before it was denied by the County Commission. GRU took its ability to manage solar in its grid to the absolute edge. If the Origis PPA had been approved by the County Commission, when in commercial operation, there would be hours when GRU would have almost 80 megawatts being delivered by solar panels. On some days, early morning daylight hours have GRU below 100 megawatts of customer load. That size of solar generation is EXTREMELY challenging to merge into our energy portfolio. None of those 80 megawatts are considered reliable by NERC, therefore we'd have to have spinning reserves or contracts with other providers to cover the loss of that solar power. If the county had not cratered the Origis deal, GRU would have been the absolute state leader in solar power as a percentage of our customer demand.

I hope the following has provided you some insight into the challenges GRU and the community is facing in regard to the net-zero carbon emission goal by 2045.