

## CASE STUDY: Southern Linc

Southern Linc, a subsidiary of Southern Company, provides wireless communications to Alabama Power, Georgia Power, Gulf Power and Mississippi Power as well as to a wide range of government and business organizations within their 127,000 square-mile coverage area. Southern Linc is currently constructing a new 4G LTE Advanced network, requiring the installation of more than 1,300 eNB communication nodes.



### THE SITUATION

Southern Linc's 4G LTE Advanced network is designed to be extremely reliable with redundancies and hardening incorporated into multiple aspects of the network. The network will provide communications coverage for the service territories of Southern Company's electric utilities and is designed to provide mission critical data and push-to-talk communications for day-to-day operations and for service restoration following emergencies. Specifically, the Southern Company affiliates plan to use the new LTE network for applications such as distribution and transmission SCADA, AMI backhaul, and commercial and industrial metering backhaul. Commercial business and government customers who value the mission critical nature of Southern Linc's LTE network will also have an opportunity to use this network for voice and data communications.

Network construction has utilized a combination of existing and new tower locations to provide a footprint similar to Southern Linc's current wireless network for installation of eNB nodes. While existing locations are already equipped with shelter facilities and backup power generators, new sites are not. Since LTE eNB equipment is smaller, more power efficient and does not require air conditioning, a large shelter is not required at new LTE sites. Because of these new factors and the time, resources and cost to maintain the current generator fleet, Southern Linc explored other options for backup power. This exploration led to discussions with Plug Power and, eventually, the decision to implement Plug Power's integrated cabinet GenSure fuel cell solution and GenFuel hydrogen supply.

### POWERING POSSIBILITIES

Southern Linc is currently deploying approximately 500 Plug Power integrated cabinets within its LTE network. The cabinet solution houses both network power and communications equipment, and includes GenSure hydrogen fuel cells for backup power. This solution offers up to 87% footprint savings versus a small communications shelter and combustion generator.

Plug Power's GenFuel hydrogen supply agreement, including intelligent fuel level monitoring, enables Southern Linc to house its specified 7 days of fuel for network operations at each site in the event that a utility service impacting event were to require backup power. Plug Power maintains the fuel supply as needed for the GenSure fuel cells, whether for routine service, emergency service or disaster recovery.

While it is still early in the partnership, Southern Linc expects that this solution will increase the reliability of its network. Southern Linc plans to measure program success by fuel cell uptime and savings in maintenance.

**“We value our relationship with Plug Power and lean on their expertise in zoning and permitting to assist with the deployment of our progressive hydrogen and fuel cell-powered network” commented David Woodham, Southern Linc engineering project manager.**



## WHY PLUG POWER & HYDROGEN FUEL CELLS

### Reliability.

Fuel cells are expected to perform more reliably with significantly less maintenance than a traditional generator. In order to gain the required reliability from a generator, one must purchase a large generator with a sizable footprint. Combustion generators require a very regimented preventative maintenance program to provide the level of reliability required by Southern Linc. Plug Power's GenSure fuel cells have been third party tested at 99.6% reliability.

### Lower Cost.

Southern Linc expects to see a 64% annual savings in backup power operational expenses by using fuel cells instead of traditional generators. Savings is calculated by including ground lease, refueling and maintenance. If a federal tax credit is available, a 16% reduction in capital expenses could be realized over installing traditional propane generators and fuel tanks.

### Smaller Space Requirements.

Plug Power's integrated cabinet offers Southern Linc reduced ground space lease requirements at each location due to the footprint savings of the cabinet compared to a shelter and generator. This has opened opportunities at very crowded tower sites where space for a combustion generator and propane tank was not available.



### Less Maintenance.

Fuel cell maintenance involves an annual filter inspection and fuel system checks each time the GenFuel hydrogen cabinets are resupplied. Southern Linc expects significant operational savings with fuel cells over the following normally-required generator maintenance items:

- Preventative maintenance site visits
- Emergency repair site visits
- Oil and coolant (not needed with fuel cells)
- Battery maintenance and theft
- Belts and hoses
- Fuel system repair
- Transfer switch repair

### Clean Energy.

Fuel cells are a zero-emission power supply. Southern Linc's average LTE site load is 1.6kW, with each site averaging 17 hours of runtime per year. Across the 500-site fuel cell network, the fuel cell solution reduces greenhouse gas emissions by 100 tons and prevents 625 pounds of pollution from entering the air when compared to propane-fueled combustion generators. This is equivalent to nearly 420,000 miles driven by an average passenger vehicle or almost 187,000 pounds of coal burned.

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