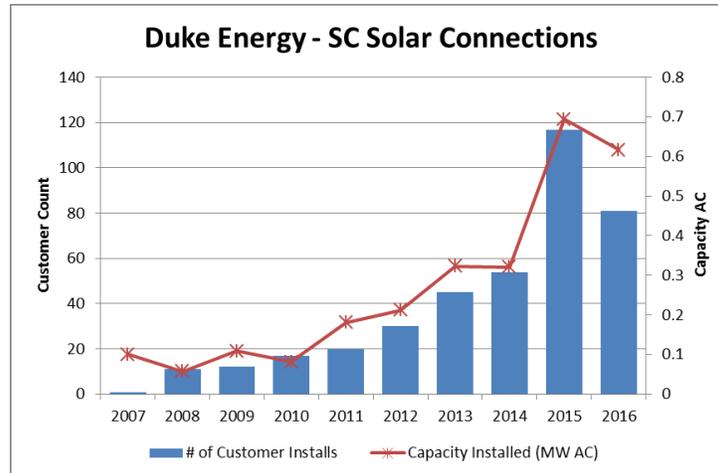


South Carolina Energy Policy Narrative

The nation's electric delivery system concept is more than 100 years old, and much of the equipment has been installed across the country, including South Carolina, for decades (e.g., transformers, capacitors, regulators). In South Carolina, as well as for South Carolina utilities operating in North Carolina, this delivery system, or electric grid, was designed to transport electricity from large centralized generation plants to customers across the Carolinas, sometimes hundreds of miles away. This fundamental infrastructure is still the basis for an electricity grid in the U.S. that is almost 100 percent reliable. Although it has served South Carolina well, the existing electric grid was not designed to support the diverse and dynamic demands that are increasingly being placed on it, such as increased distributed energy resources, reliability challenges and grid hardening/security issues.

In particular, the existing grid is limited in its capability to integrate large amounts of renewable energy sources. Keeping the grid running reliably is a balancing act, where the amount of power put into the grid must equal the amount taken out. So the electricity being used right now was created just a few seconds ago, at a generation plant that an operator can ramp up or down continuously to meet electric demand of the customers it serves. With the variability of renewable energy sources, like wind or solar power, this balance becomes increasingly difficult to maintain. In South Carolina, with the passage of Act 236 and the expansion of distributed energy resources already expressed in the policy and statutes of this State, this becomes especially important. Given the level of solar subscription and expansion in the last two years within the State (cite some SC stats, need input from other Utilities), state policy makers should consider whether current policy and statutes provide for the flexibility to enable and foster the grid investment to support the integration of renewables. Duke Energy has seen a drastic increase in the numbers of customers connecting solar, with the 198 new customers in 2015 and to date in 2016. This is more new customers than the previous 8 years combined. Below is a graph showing the annual increases in solar connections.



The continued safe and reliable operation of the grid is critical, and given the adoption of digital consumer and commercial technologies, outages have become increasingly impactful if they occur. South Carolina has seen reliability challenges from storm restoration and polar vortex scenarios. While the utilities have been commended for excellent restoration in South Carolina considering the severe weather seen in this State in recent years, challenges to the grid make restoration an increasingly difficult task (e.g., Winter storm of February 2014). Reliability is also important not only to residential consumers, but to the economy of South Carolina as well as large manufacturers that could lose entire production runs if they are out of power. Reliability is key for economic development and businesses contemplating South Carolina locations. Of course, hospitals, commercial establishments, schools—all rely on a reliably power supply.

There are significant grid enhancements that have taken place in South Carolina. These include Volt/Var Optimization systems like Duke Energy Progress' Distribution System Demand Response program and self-healing networks. **(cite other programs from other SC utilities)**. However, utilities foresee the need for such investment as growing. Therefore, meeting customer expectations for power 24x7, and immediate restoration when an outage does occur, requires enhancements and improvements in infrastructure to maintain reliability and system integrity in South Carolina. In order to enhance reliability and resiliency, a modernization of the existing infrastructure is necessary and state policy makers should consider whether current policy and statutes provide an optimum path for such investment.

The modernization of the grid includes the application of information technology and digital equipment that provide the remote monitoring, remote control and expanded intelligence capabilities, including smart meters at the homes of consumers. Smart meters, as reported by the Economic and Demographic Subcommittee, provide a path for customer programs and data that provide more transparency and control to consumers over their usage and ultimately their bill. Currently there are **XXX** smart meters installed in SC, and of these, **XXX** are capable of

supporting Time-of-Use (TOU) rates. TOU rate programs provide customers with variable usage charges based on the time of day, to encourage optimal usage patterns. The policy of South Carolina has supported the use of this technology for customer through statutory enablement of pre-pay programs, and XX utilities currently have prepayment programs using smart meters and XX expressed interest in such programs in the future. Such programs allow for other customer benefits outlined in [the Economic & Demographic section].

Furthermore, it became clear through the development of this Energy Plan that electric utilities are facing expanding customer expectations, increasing environmental regulation, and new technologies that have to be integrated seamlessly into the grid. The grid of the rapidly-approaching future will function in ways never imagined when the original wires were installed. If South Carolina is to participate in the innovation coming to fruition in the electric sector such as distributed energy resources like solar panels, wind turbines, electric vehicles, and microgrids, then the State will require an advanced, integrated grid to manage and optimize the increasingly dynamic flow of electricity. State policy should balance the needs of consumers, the requirements of the grid, and the desire to keep pace with technology in maintaining or refining policy that fosters disciplined investment.

All of the needs described above in SC require communications among grid equipment and with centralized systems. Tomorrow's grid will operate with increased efficiency, easily integrate renewable sources of generation, and provide South Carolina consumers and utilities with near real-time data and greater monitoring capabilities.