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F R O S T  S U L L I V A N

Excellence in Energy
Resourcefulness
Award:

Grid Intelligence

Tampa Electric

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BACKGROUND AND COMPANY PERFORMANCE

Introduction

Climate change has exposed clear threats to the integrity of electric infrastructures, and the number of regions immune to this threat is shrinking. Extreme drought presents a risk of wildfires in areas with dense vegetation. Rising sea levels can cause greater inundation and damage from high tides, especially for coastal cities and peninsulas, such as Florida.

Future strategies to address climate change include climate mitigation and adaptation. The need to act is urgent. Florida will lose \$76 billion in climate change related costs by 2040. As a result, climate change implementation plans are becoming an integral part of grid infrastructure planning. These plans address the physical, social, and ecological impacts of climate change. Protecting grid assets is especially important because of the impact on grid resiliency. Tampa Electric, an Emera Inc. based subsidiary based in Tampa, Florida, has felt the brunt of climate change, especially during Hurricane Ian. State regulators were quick to approve long-term plans for grid hardening, including increasing the number of underground power lines.





FOCUS ON THE FUTURE AND BEST PRACTICES IMPLEMENTATION

On the climate mitigation front, utilities are adopting a zero-carbon emission strategy, which broadly consists of transitioning to clean energy and implementing energy efficiency strategies. In 2021, Tampa Electric announced its intent to achieve zero-carbon emissions by 2050 by taking a multi-prong approach:¹

1. Increasing the use of zero/low-carbon technologies that are already in place
2. Investing in emerging solutions to generate more clean energy
3. Improving existing power stations
4. Modernizing electric grids
5. Enhancing partnerships with customers and the community

¹ [Tampa Electric Net-Zero Carbon Future](#)

The company is an early adopter and promoter of clean energy and was among the first investor-owned utility companies to offer a renewable power program in the 1970s. Given its advocacy and strong drive for clean energy, the company has reduced its carbon emissions by 50% since 1999.

Transitioning to cleaner fuel requires careful long-term planning to prevent sudden and fluctuating rates, compromised customer comfort, and lapses in power reliability. To address these issues, the utility company rolled out community-oriented interactive demand-side management programs.

The company paired these programs with monetary customer rewards and enabled them with Internet of Things systems. Parallel to demand-side management programs, the utility company is monetizing its \$500 million advanced meter infrastructure (AMI) by rolling out outcome-oriented applications for decarbonization and climate resiliency. Distributed intelligence (DI) will power all applications for an additional \$7–\$10 million in costs. The format is a license agreement.



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Frost & Sullivan recognizes Tampa Electric as the recipient of 2022 Excellence in Resourcefulness for Energy because of its longtime commitment to grid resiliency, demand-side management, and distributed clean power.

The table below lists the criteria to measure Tampa Electric’s success in energy resourcefulness.

	Poor	Fair	Good	Excellent
SOCIAL IMPACT				
Improving customer awareness and participation			✓	
Enabling behavioral changes to reduce waste through customer engagement and technology-driven programs				✓
BUSINESS IMPACT				
Strengthening the utility’s brand image as a leader in sustainability				✓
Achieving operational efficiency as a result of a successful sustainability strategy				✓

Social Impact

Enhancing Partnerships with Customers Through Demand-side Management Programs

Tampa Electric's Energy Planner program is a voluntary automated price-based demand response program with 4,200 of its over 800,000 customers enrolled. A gradual rollout will ensure cost-effectiveness and success. Outreach programs and promotions consist of multi-week energy savings campaigns promoted via the main forms of media. Demographics consist of retirees interested in reducing their monthly bills, early adopters of smart home technologies, and environment-conscious residents.

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The program targets the highest energy consuming appliances inside homes. In Florida, air conditioning accounts for more than 27% of all energy that households consume, as opposed to 6% nationwide. Air conditioning accounts for 19% of household energy in Georgia, 18% in Texas, and 10% in Tennessee. Heating, ventilation, and air conditioning costs are some of the highest monthly expenses for low-income residents.

This program evolved from a previous direct load control program in 2006 that included 4 pricing rates depending on the degree of overall usage in the territory. The program promises lower rates 87% of the time during all hours on weekends and holidays.

The categories of prices are low, medium, high, and critical. Critical indicates when overall demand in the utility territory is at its highest, so it carries the highest price. This period is typically no more than 1.5% of the total hours in a year. Through a mobile app, customers can access, keep track of, and curb consumption based on the pricing period, and they have the option to override events.

The developers built the solution on a turnkey offering based on its years-long technology partnership with Itron. Itron provided the GenX load control switch, IntelliSource Enterprise, and interconnection with the already deployed AMI solution. It is currently a two-year hosted solution with the intent of extending the contract to 5 years. Itron manages the field work, project management, and customer call center. The utility company offers smart thermostats and direct load control pool pumps at no cost to the customer. All the devices communicate via a utility WiFi network. For added redundancy and to improve restoration time, the solution uses smart street lighting to communicate with its load control switches. Street lighting is available across 90% of the utility's territory.



Business Impact

Curtailing Consumption and Enhancing Leadership Position for Sustainability

Demand-side management programs are instrumental to addressing future energy demand in the state. Florida estimates that electricity generation will need to increase by 7.6% by 2027² because of the state's growing population. Expanding infrastructures is not always feasible or cost-effective, because in most cases, it means raising customer rates. Keeping rates low and affordable while preparing infrastructures for future energy demand is an important objective for the utility company. By participating, customers will experience 10% savings in their electric bills, and the utility company will shed 3.1 kW during the winter peak and 2 kW during the summer peak, easing the burden on the grid itself.



2 [Florida Energy and Climate Plan \(fdacs.gov\)](https://fdacs.gov)

DI Using Real-time Data on the Edge

Tampa Electric is on its way to becoming a leader for sustainable solutions. Itron powers Tampa Electric's DI initiative. DI allows utilities to use real-time data more effectively at the edge. A Riva network interface card connects to a Gen5 router that provides the local area's connectivity, while the Gen5 router creates a backhaul to the utility back office. This system promises to offer one-second peer-to-peer communication that results in less power interference and fewer wasted resources. Notable applications that DI will enable include the following:

- ▶ Meter bypass theft detection DI app
- ▶ High impedance detection app
- ▶ Residential neutral fault detection
- ▶ Location awareness
- ▶ Electric vehicle (EV) detection
- ▶ Photovoltaic (PV) detection

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The initiative is in the testing, co-development, and theft detection phase, during which the company hopes to solidify its proof of concept, algorithms, and functionalities. The company is reviewing location awareness, such as EV and PV detection, to pair with smart inverters and transformers. This possibility is an economical way to convert the spread of distributed energy to a microgrid in which the company can roll out localized programs for vehicle charging and the customer can resell excess power back to the grid.

CONCLUSION

Tampa Electric's commitment to investing in the future of energy is evident. Energy is the backbone of the nation's economy and continues to face growing threats from compromised grid reliability because of damages, energy supply insecurities, and increasing prices. The company's sentiment to serving its community is strong. Tampa Electric exemplifies its devotion to boosting Floridian living standards by introducing technology-forward energy conservation programs, helping to reduce the overall cost of energy consumption without compromising comfort. Tampa Electric has set a clear example for other utility companies to pursue in enabling clean energy, like EV and PV, which receive power from technology partners such as Itron.

For its overall strong performance, Tampa Electric is deserving of Frost & Sullivan's 2022 Excellence in Resourcefulness for Energy.

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For over six decades, Frost & Sullivan has provided actionable insights to corporations, governments and investors, resulting in a stream of innovative growth opportunities that allow them to maximize their economic potential, navigate emerging Mega Trends and shape a future based on sustainable growth.

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