

## **Extended Runtime: How Will It Affect Your Network Infrastructure?**

The cable broadband network has evolved from being a vehicle for the provision of entertainment services to become a strategic element of the country's infrastructure, providing broadband internet access to both homes and businesses. As the network's capacity has grown, more and more mission critical applications are reliant on it. This dependence has been further increased by the pandemic, as the boundaries between home and office have eroded.

Without appropriate backup measures in place, however, network availability is only as good as the utility grid that powers it. Cable broadband operators, otherwise known as multiple-system operators (MSOs), have built resilience to power outages into their network by deploying combinations of generators and battery backup systems in headends, [critical facilities](#) and outdoor pole and ground sites. Nevertheless, recent extreme weather events across multiple states are leading to more frequent and longer power outages which are testing MSO backup capabilities.

Whether for competitive or regulatory reasons, extending network runtime is fast becoming a priority. MSOs are beginning to explore how this growing requirement will impact their network operations.

### **Extreme Weather Events Drive Increased Network Outages**

There is no doubt that extreme weather events are becoming both more frequent and more severe, causing significant damage, disruption, and loss of life. In 2020, according to PowerOutage.us, (an aggregator of power outage data from U.S. utilities), extreme weather events were responsible for 1.33 billion utility outage hours, up by 73% from 2019's figure of 770 million.

In February 2021, winter storms caused the largest blackouts in almost 20 years, leaving over 9.9 million people in the U.S. and Mexico without power. In Texas alone, more than 4.5 million homes were affected, some for several days.

Tropical storm Henri knocked out power to 100,000 homes in Rhode Island, and, in September, Hurricane Ida left over 330,000 cable subscribers in Louisiana without service.

In California, record-setting Dixie and Caldor fires of 2021 came after several consecutive, severe wildfire seasons prompting the California Public Utility Commission (CPUC) to mandate a 72-hour backup power requirement for wireline networks in high fire threat districts.

This mandate has had a major impact on the network operations of the state's MSOs and other communications providers. For most, upgrading to 72 hours is a major undertaking, particularly with the aggressive timeframes imposed by the CPUC. It is too early to tell if other states will follow California's lead but, whether mandated or not, MSOs across the country should review their standby plans to ensure they keep customers connected through unpredictable extended outages.

## Extending Network Runtime

Hybrid fiber-coax (HFC) networks are traditionally backed up by combinations of generators and battery systems. Extending the runtime involves increasing the energy storage provided by one or both. This sounds straightforward and may well be at larger sites with available space and where reliable fuel sources keep the generators running.

Smaller, [outside plant](#) (OSP) sites on the other hand, can present a range of challenges since many have severe real estate restrictions. Cabinets at these sites are usually deployed in one of two sizes, housing either three or six batteries. Pole-mounted installations may not support the weight or mounting of additional cabinets and many ground-mounted locations just don't have enough available space. Portable generators can add backup capacity, but truck rolls required to deploy and refuel them can cost well over \$200 per site<sup>1</sup>, and in many locations the generators are a target for theft.

Fortunately, technology advancements driven in part by the electric vehicle industry are producing higher energy density battery solutions, providing more backup time in the same amount of space. [Thin plate pure lead](#) (TPPL) and lithium-ion batteries enable progressive increases in energy density but come with their own sets of considerations. Charging mechanisms for these new battery types, especially for lithium-ion are much more sophisticated, so the uninterruptible power supply (UPS) must be redesigned to ensure optimum and safe battery performance. Energy demands vary across site types, dictating both the required number and types of deployed batteries. Additional environmental conditions, mainly temperature, significantly influence battery performance and charging times.

The bottom line is that there is no "one-size-fits-all" solution for increasing HFC network runtime and many factors must be considered when engineering a solution for a specific site. Improving energy capacity can be a major undertaking that requires specific expertise to ensure that the designed solution balances performance and safety against total cost of ownership (TCO).

## EnerSys®, Powering the Cable Broadband Network

With over 40 years of experience in powering [broadband networks](#) and over 100 years of world-leading expertise in industrial battery technology, EnerSys® is uniquely positioned to help their customers in all aspects of network energy solutions. The comprehensive EnerSys product portfolio includes the Alpha® XM3.1-HP line of high efficiency broadband power supplies and temperature resilient, high-capacity AlphaCell® batteries. The Alpha enclosure range provides exceptional thermal management and security against theft, and the powerful Alpha Continuity software enables cable broadband operators to monitor the status of their standby power supplies across their networks.

By combining in-depth knowledge of OSP cable and power with their expertise in advanced battery technologies, EnerSys has been instrumental in helping their customers in California meet the stringent 72-hour runtime requirement. The deep, long-standing relationships between EnerSys and its customers in the region have enabled the high levels of collaboration required to accelerate product development within the compressed timeframes of the CPUC mandate.

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<sup>1</sup> <https://rcntechnologies.com/the-true-cost-of-field-checks-truck-rolls/>

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