

# ARGONNE HELPS GE MAKE DURATHON™ INDUSTRIAL BATTERY TO MEET GROWING ENERGY NEEDS



**A new long-life battery built to aid utility companies in meeting the growing energy demands created by electric vehicles and the integration of solar and wind power on the national power grid was developed with the help of high-energy x-rays from the U.S. Department of Energy Office of Science's Advanced Photon Source (APS) at Argonne National Laboratory.**

Scientists with General Electric Energy Storage Technologies, a unit of GE Transportation, developed new battery chemistry by using APS x-rays to understand the mechanism by which sodium batteries discharge and store energy. This knowledge helped improve battery capacity, power, and safety, while the new battery design has the potential to lower overall power costs by eliminating the need for expensive installation of a controlled environment to keep the battery function at peak performance.

The APS high-energy x-rays provided penetration power combined with a small focusing area to peer into battery cells and map chemical distributions and reactions.

The new 550-volt Durathon™ battery supports a broad range of utility-

oriented applications, such as: transmission and distribution upgrade deferral, time shifting, congestion relief, peak shaving, load following, and reserve capacity. It will support utility transition, renewable power generation telecom power support, uninterruptable power supply, and industrial transportation.

## IMPACT

Because of GE's proprietary chemistry, the Durathon™ has the ability to last up to two decades while providing optimal charge and discharge times, even in extreme temperature environments. They are half the size of conventional lead acid batteries and last 10 times longer.

The Durathon™ battery's advanced design and science generated more than 30 patents.

GE built a new plant to produce Durathon™ batteries in Schenectady, N.Y., that is expected to employ 450 workers. GE researchers continue to enhance the battery chemistry.

GE is making a \$150 million investment to build upon the Durathon™ battery technology through the development of new materials, new manufacturing technologies, and intelligent controls. GE plans to expand the battery use into next-generation energy-efficient buses, locomotives, and mining vehicles.

## PARTNERS

Research was done by GE scientists using the APS.

## FUNDING

The U.S. Department of Energy Office of Science funds the APS. GE paid for use of the APS x-ray beamline.

## TIMELINE

The Durathon™ battery is based on sodium metal halide chemistry, which was originally pioneered by Beta Research & Development Ltd. in the 1980s. GE bought the company in 2007 and refined the technology, in part, through work at the APS. Production of Durathon™ batteries began in September 2011; the plant opened in July 2012. In October 2012, Durathon™ batteries completed qualifying tests to earn NEBS Level 3 certification.

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