

EERE Technology Commercialization Portal

Connecting Energy Industry
and Market Leaders with
Laboratory Technologies



The U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy is pleased to announce the release of its Technology Commercialization Portal. The Portal is designed to be a key tool for investors, entrepreneurs and other technology seekers to rapidly filter and identify technologies that have been developed by DOE laboratories, and are available for licensing. Whether looking for an idea to incorporate into an existing technology portfolio, or searching for start-up opportunities, the Technology Commercialization Portal will become your go-to site to browse technologies that have come out of your Department of Energy.

The focus of the Portal is energy efficiency and renewable energy technologies. To enhance that focus, the Portal contains a compendium of more than 14,000 U.S. patents and patent applications that have been created using DOE funding since 1992. These patents cover all areas of research, from fossil energy to biotechnology. The true gold in the Portal mine is the more than 100 technology marketing summaries that lay out market-focused information about patented technologies. Most of the technologies are linked directly to a patent in the database, facilitating access to information. Visit the Portal now! You will be glad you did.

***Visit the EERE Technology Commercialization Portal at
techportal.eere.energy.gov***

Battery Life Estimation and Data Analysis (BLE)

Abstract

Argonne's BLE Software is a state-of-the-art analytical tool for predicting cell and battery lifetimes on the basis of limited test data. Because hybrid vehicles are so new to the market, researchers don't have data spanning many years. They need a tool to reliably, quickly and accurately predict battery performance. BLE software can make life-cycle estimates using as little as two years' worth of aging data. With this limited data, researchers can use BLE to estimate how battery performance will change with calendar age, cycles, internal component aging, cell-to-cell manufacturing variations and summer and winter temperature extremes for estimates up to 15 years or more.

Technical Description

The BLE software employs a generalized statistical approach to fit data from accelerated aging experiments to a life equation. It operates on a Windows 2000 or later system and uses .NET framework extensions, which are widely available at no cost from Microsoft. The software can run on a standard PC. No specific life equation is assumed; users enter their own technology-specific equation. If a specific equation is not available, Argonne's developers included two simple life equations. Also included is a linear error model to estimate cell-to-cell variability and measurement errors. A two-sigma error bound is calculated for the variance.

The BLE software is different from other curve-fitting routines in that it employs robust curve-fitting techniques and has the ability to estimate battery life by using Monte Carlo techniques (which most generalized curve-fitting software do not consider). A Monte Carlo simulation is available to assess lack-of-fit and uncertainty limits for average cell life. The Monte Carlo simulation is only used for the 15-year predictions. The software can operate in three modes: data fit only, data fit and Monte Carlo simulation, and Monte Carlo simulation only. Run times for the data fitting routines are very fast. Monte Carlo predictions take a little longer, but are generally complete in about 2 minutes.

Benefits

- Projects cell and battery lifetimes using limited data
- Provides easy-to-use interface and rapid results
- Employs robust fitting techniques and uses Monte Carlo techniques to estimate battery life
- Runs on conventional computer platforms

Applications and Industries

- Battery manufacturers
- Alternative vehicle manufacturers
- Other industries that have products that exhibit performance degradation with time

Developmental Stage

Mature - available.

Availability

Available by license to users through Argonne's software shop (http://www.anl.gov/techtransfer/Software_Shop/BLE/BLE.html)

The software is available at no cost to USABC/DOE contractors, but licensing is still required.

Intellectual Property Status

This software is protected by copyright.

Contact

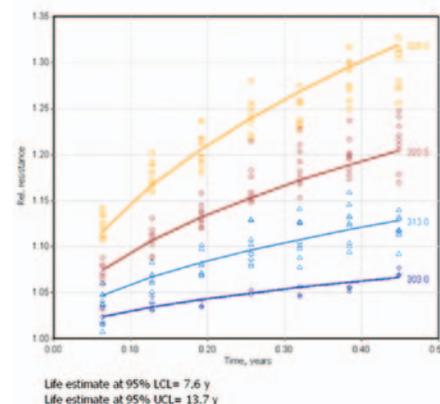
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Storage



Software & Analysis



Results of Simulation, with Projected Battery Lifespan (LCL: lower confidence level; UCL: upper confidence level)



Batteries Used in Simulation