



## SOLUTION AT A GLANCE: CHARACTERIZATION AND SURVEY OF AUTOMATED FAULT DETECTION AND DIAGNOSTIC TOOLS

### SECTOR

Commercial

### BARRIER

Identifying or evaluating energy-saving technologies

### TOOL TYPE

Case Study

### TECHNOLOGY

Energy Management Systems, Automation, Controls, HVAC, Lighting

### OVERVIEW

A recent report released by Lawrence Berkeley National Laboratory (LBNL) explores currently available AFDD technologies for commercial buildings. AFDD, or Automated Fault Detection and Diagnostics, is a growing family of technologies that are increasingly being adopted in many commercial building sectors. AFDD tools allow building operators to monitor various building systems closely, detecting and isolating operational errors and problems in real-time. It is estimated that 5%–30% of the energy used in commercial buildings is wasted due to faults and errors in the operation of the control system.

This study characterizes the diverse landscape of AFDD technologies, using a common framework that captures key distinguishing features and core elements. The framework is applied to 14 currently available technologies representing solutions that integrate with a building automation system (BAS), that use temporary in-field measurements, or are implemented as retrofit add-ons to existing equipment.

Key findings show that AFDD technologies are being used in nearly all commercial building sectors and that there is an uptake in market delivery of FDD through third-party service providers. In addition, most of the technologies available offer common functionalities, like integration with BAS and coverage of major HVAC and lighting systems. Distinguishing factors are often associated with the additional features offered to complement the AFDD, and with the available delivery models. The market offers great diversity in additional analytics and reporting capabilities, integration

architectures, and purchase models, making it possible to custom-fit the technology to the needs of the organization. While custom solutions are desirable for some portions of the buildings market—such as campuses, enterprises, and large or complex facilities—others may benefit from higher degrees of commoditization.

The study concludes with a discussion of technology gaps, needs for the commercial sector, and promising areas for future development.



## Lawrence Berkeley National Laboratory

# Characterization and Survey of Automated Fault Detection and Diagnostic Tools

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November 2017

