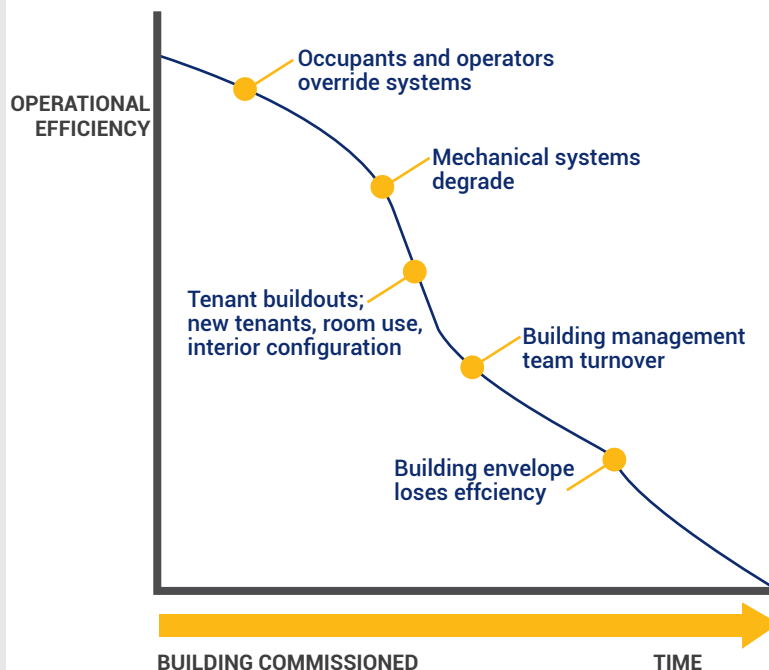**Albireo Energy**
Partnering for Success

Commercial and institutional buildings are dynamic; constantly changing use and configuration. Unfortunately, as they change, they lose operational efficiency. The original design becomes obsolete, systems degrade, and building occupants and operators make adjustments to compensate for the inefficiencies.

Building automation and control systems are designed to monitor and control HVAC, lighting, and refrigeration systems, but generally are unable to identify building anomalies. A building may be maintaining its desired temperature, but mechanical equipment and control sequences may be running inefficiently. With rising energy costs, identifying the root cause of the inefficiencies is critical.

Albireo Energy's Fault Detection and Diagnostics service, BEYON-D™, provides proven analysis of your building's operational performance and energy usage ensuring building owners and managers are aware of operational deficiencies and understand their impact.

OPERATIONAL EFFICIENCY

Occupants and operators override systems

Mechanical systems degrade

Tenant buildouts; new tenants, room use, interior configuration

Building management team turnover

Building envelope loses effciency

BUILDING COMMISSIONED

TIME

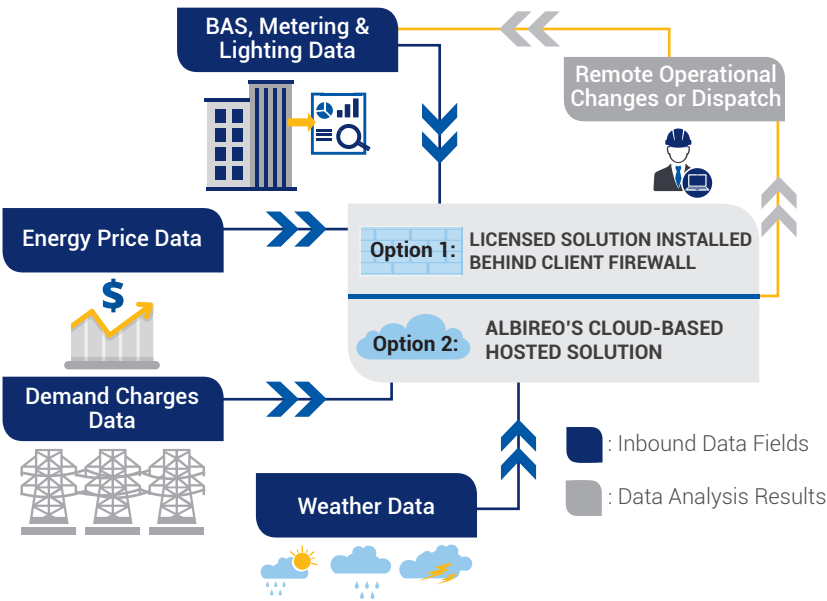## Fault Detection and Diagnostics (FDD) and Energy Reporting

BEYON-D helps building operators improve energy efficiency, reduce operational costs, and improve occupant comfort. BEYON-D leverages sophisticated software with advanced algorithms that quickly analyze building energy use and equipment data to identify issues, faults, and opportunities to optimize building performance. With a team of mechanical, electrical, and energy engineers on staff and decades of experience optimizing HVAC and lighting systems, Albireo Energy can quantify the impact of each anomaly, help prioritize remediation based on ROI, and implement the most practical solutions.

BEYON-D™ IS A SERVICE OFFERING THAT WILL:

• Calculate your building's current energy usage

• Utilize algorithms to efficiently identify anomalies and operational deficiencies

• Prioritize anomalies and recommend corrective actions based on anticipated impact

• Allow you to create work orders and comprehensive reports

• Provide a Measure and Verify (M&V) tool to track performance of energy conservation measures

• Deliver predictive maintenance modeling to ensure your building is always performing at its peak

BAS, Metering & Lighting Data

Remote Operational Changes or Dispatch

ONSITE OR IN THE CLOUD

BEYON-D's platform has the flexibility to be installed onsite or in the cloud. Regardless of internal IT policies and resource availability, our solution can meet the requirements. We will work with the IT department to understand requirements, collaboratively define a solution, and support or lead the implementation.

Energy Price Data

Option 1: LICENSED SOLUTION INSTALLED BEHIND CLIENT FIREWALL

Option 2: ALBIREO'S CLOUD-BASED HOSTED SOLUTION

Demand Charges Data

: Inbound Data Fields

: Data Analysis Results

Weather Data

Integration and Configuration

The BEYON-D platform integrates data from virtually any system or database. It uses standard platform protocols including BACnet, OPC, XML, and a library of integration drivers, to capture data from existing systems. BEYON-D adds descriptions and relationships about the data in the database during configuration, and links appropriate points to algorithms in the system. User accounts are configured and web access is provided.

COMMON AND IMPACTFUL ANOMALIES

There are an infinite number of anomalies that may be identified, but the following is a sample of the more common and impactful anomalies found.

	Common Anomalies	Operational Impact
Anomaly 1	Economizer Malfunction - outside air damper improperly opened or closed	Energy Efficiency
Anomaly 2	Simultaneous Heating and Cooling	Energy Efficiency
Anomaly 3	Equipment Runtime Exceeding Occupancy Schedule	Energy Efficiency Equipment Lifecycle
Anomaly 4	Chiller Drawing High kW/Ton - indicates chiller inefficiency	Energy Efficiency Equipment Lifecycle
Anomaly 5	Chiller Low Delta T Syndrome - indicates chiller inefficiency	Energy Efficiency Equipment Lifecycle

Anomaly 1

Blue: AHU SAT Below SP – Improper Heating Logic

Red: Econ Differential Enthalpy – Improper Cooling Logic

Fault Data

Weather Data

Equipment Data