



Executive Summary

After our assessment, our we found there is a significant opportunity for improving the performance of these properties. The natural states of the incoming power currently results in:

- **Inflated Electric Power Cost (5+%)**
- **Inflated System Maintenance Costs (25+%)**
- **Decreased System Lifetime (25+%)**

These factors could negatively impact both revenue performance, cost performance and overall profitability performance if not addressed. Resolving the incoming power issues represent an opportunity to significantly improve the NOI of the facilities.

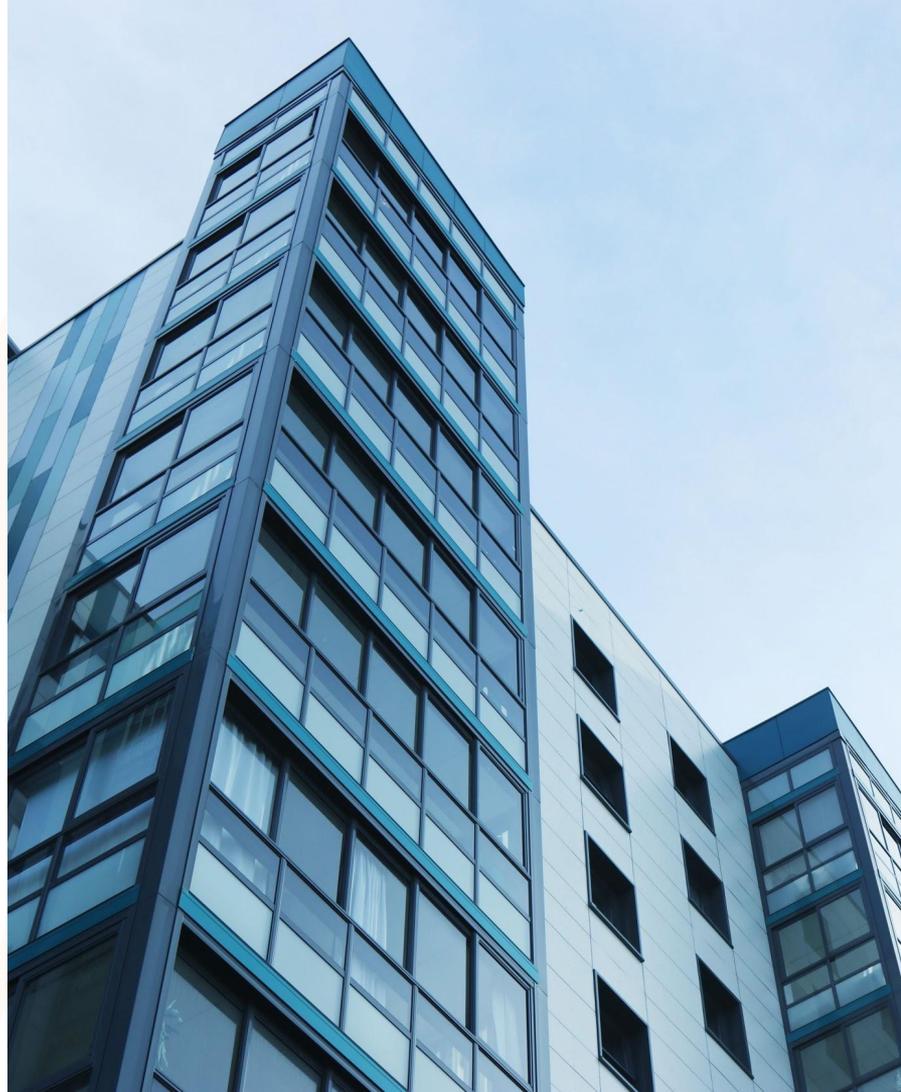
Estimated 20-year energy savings for these 3 feeds:

\$1,500,145

Estimated Average Risk Mitigation of 25% to 37%

20-year excess GHG emissions: 1,740 Metric Tons

Elimination of 28,660 power events over 20 years to increase system performance, occupant satisfaction and revenue while reducing expenses.





Power Impact Report



Introduction

The Legend Power® Power Impact Report™ is designed to create visibility to the full impact that power has on the performance of your organization. Let's face it, without power – your buildings are empty and revenue stops. However, not all power is equal. Poor power can impact your critical building and safety systems, which impacts your revenue, your expenses, your profitability and, ultimately, your valuations.

The Power Impact Report is comprised of two elements; the Power Quality Index™ (technical data based), and the Risk and Loss Report™ (translating the data into actionable business insights). The focus is to identify buildings where power is negatively impacting your building's performance – and correcting it using Legend Power's SmartGATE.

Both of these assessment tools are based on independent 3rd party research and calculations and combined with Legend's proprietary measures developed from review of over a thousand buildings. The rankings of your building(s) are based on a comparison to anonymized, aggregate data across the knowledge base.

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Risk & Loss Report

Risk and Loss Overview

The Risk and Loss Report™ translates the data gathered in the Power Quality Index Report into actionable information. These assessment tools are based on 3rd party research compiled from Legend's review of hundreds of industry research papers as well as our research on over a thousand buildings.

We use your specific building's actual power data and available 3rd party research and calculations to predict your building's performance in 3 critical areas – efficiency, lifetime and reliability.

When systems malfunction or fail, they have exponential impact. Not only do you pay to repair or replace the equipment, but it impacts the people who depend on your building. Systems like HVAC, Air Filtration, Elevators, Life/Safety Systems, Occupancy Sensors and more. High-tech systems your occupants depend on, like filtration sensors, infrared temperature detectors, distance monitoring and more, are highly sensitive to unstable power. Not to mention that you depend on these same people for your renewals and revenue. Of course, under-performing systems also contribute substantially to energy waste.

This section assesses your actual power data and projects the impact on your systems performance and efficiency giving you full visibility on the impact of power across your entire business.

Current conditions negatively impact 7 of the top 11 areas of tenant satisfaction

Overview

Overall Energy Impact – Overall, the initial results of the SmartGATE platform show significant opportunities for improvements. The energy provided is outside of the optimal ranges for your building systems.

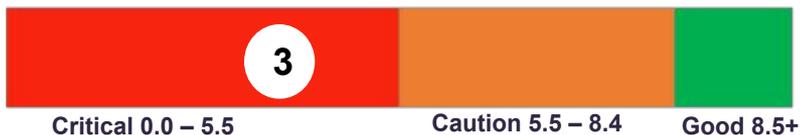
The incoming electricity to your buildings is critical, as it not only impacts your carbon footprint and energy costs, but also plays a crucial role in your tenant experience, renewal rates, rental rates and operating expenses.

Poor quality electricity creates these conditions and ultimately plays a significant role in the profitability of your firm and its value.

	Efficiency	Lifetime	Reliability
Good	Minimal Energy Waste Minimal Operating Impact	Minimal decreased life expectancy	Less than 24 Variation Events per Year
Caution	Energy Waste of 2.0 – 3.9% Increased Operating Temps 10%	Decreased life expectancy of 10-20%	Between 25 - 50 Variation Events per Year
Critical	Energy Waste of 4.0% or more Increased Operating Temps >10% increase	Decreased life expectancy greater than 20%	More Than 50 Energy Variation Events per Year
Systems Impacted			
Elevators Air Filtration HVAC Life/Safety Systems Occupancy Sensors Lights Computer Controllers Pumps			

Current State

Total Feeds Assessed- 3



Building	Overall PQ Index 10-High, 1-Low	Energy Waste & Inefficiency	Decreased Life Expectancy	Annual Moderate / Severe Events
1060 Broad L	4.7	5.6%	26% - 37%	706
1060 Broad R	4.9	5.9%	25% - 37%	706
81 Lincoln	4.9	4.4%	26% - 37%	21

Risk & Loss Distribution

Current conditions negatively impact 7 of the top 11 areas of tenant satisfaction in all three power sources of the two buildings studied.

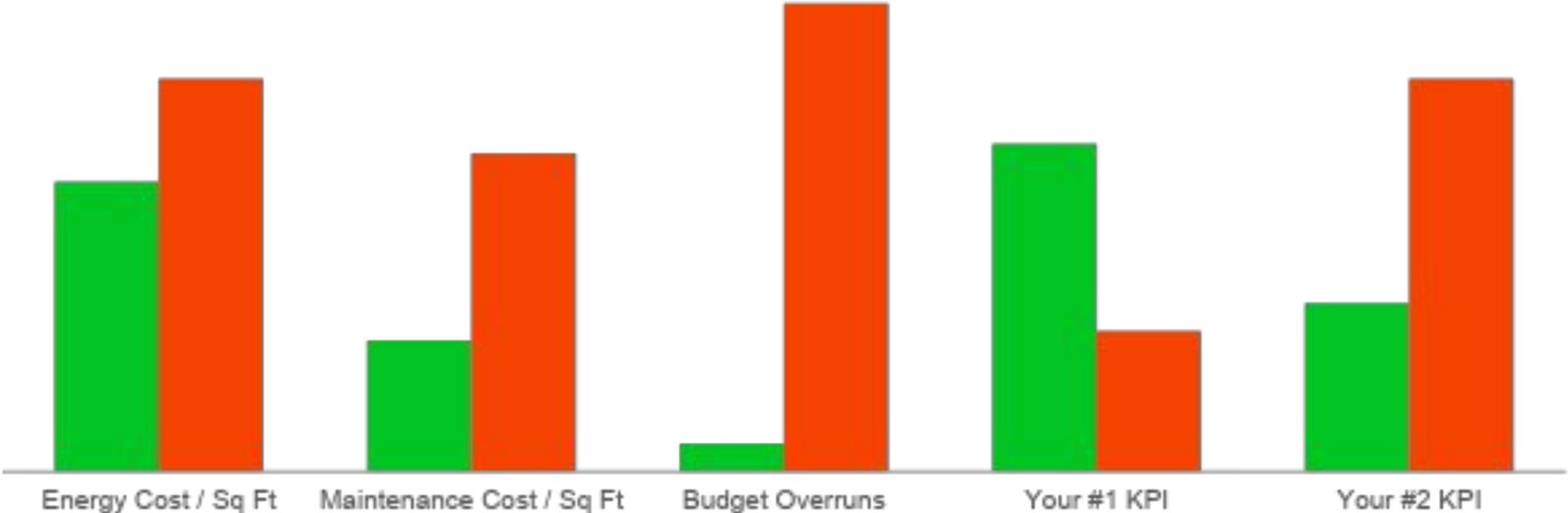
In addition to potential lost revenue due to potentially lower satisfaction rates, there is a significant financial loss due to increased repair and maintenance costs and wasted energy.

The risk of premature major system failure is 25% - 37% higher than usual due to the volatile power supply. This impacts life and safety systems, elevators, lighting/controls, computer controllers, escalators, HVAC, chillers, pumps, drives, and more.

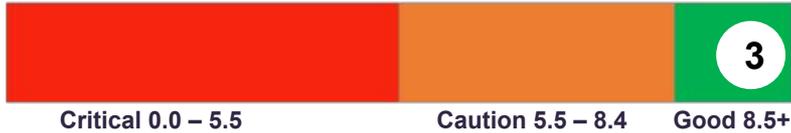
While the power supply is within utility operating standards, it is far outside the optimal ranges.

Legend Power is recommending these sites for immediate energy remediation action.

Impact on Your Key Metrics – *sample KPI'S*



Future State
Critical Feeds - 0



Building	Overall PQ Index	Energy Savings & Efficiency	Increased Life Expectancy	Annual Moderate / Severe Events
123 Main St	4.7 → 8.5	5.6% \$17,545	22% - 31%	706 → 0
511 Birch Ave	4.9 → 9.2	5.9% \$12,365	21% - 31%	706 → 0
721 Valley St	4.9 → 9.3	4.4% \$16,385	22% - 31%	21 → 0

Risk & Loss Mitigation

By implementing the SmartGATE platform you can expect dramatic improvement in 7 of the 11 top areas that impact tenant satisfaction. Better Satisfaction drives higher retention. Higher retention drives costs down and revenue up.

Fewer opportunities to damage systems extends useful life of key building systems like life and safety systems, elevators, HVAC and much more – while reducing maintenance, repair and replace costs significantly.

The Legend Power Systems SmartGATE platform can mitigate and remediate the negative energy and the impacts. The SmartGATE platform will automatically identify and minimize the root cause of these negative impacts.

The following demonstrates the impact expected from the SmartGATE platform

Estimated 20-year energy savings for these 3 sources:
\$1,200,145

Estimated average Risk Mitigation of **25% -37%**

20-year excess GHG emissions reductions
1,740 Metric Tons

Elimination of **28,660** power events over **20 years** to increase system lifetime & performance, occupant satisfaction and revenue

Cost of 3 SmartGATES: **TBC**

Areas of Tenant Satisfaction Impacted

In a recent CBRE report of tenant satisfaction, the highest impact area is Building management. This report continues to further segment the details into specific areas of influence. The number one area that impacts tenant satisfaction is the timely resolution of building faults, such as elevators, HVAC, access systems, life and safety systems, and control systems. While there are a variety of root causes that impact these areas, incoming energy has a significant impact.

Many buildings can be, or will be, experiencing faults given the current condition of the incoming energy to the portfolio. Specifically, the number of power-related events is high and is increasing both in frequency and severity. This will increase the number of building faults as well as malfunctions of these critical areas.

As stability in the electric grid continues to decline due to decarbonization, the underlying short-term energy events which cause a significant percentage of these malfunctions will increase. Unprotected systems will experience an increasing number and severity of these types of faults – thereby putting tenant satisfaction at risk.

We recommend that immediate steps be taken to improve the condition of the incoming power, thereby significantly decreasing the number and severity of power-related events – thus preventing building faults related to incoming energy.

Stack Rank	Category	Rank (5 High - 1 Low)	Current Energy Impact
1	Correcting Building Faults	4.5	High
2	Building Security	4.5	Medium
3	Internal Climate Control	4.5	Medium
6	Elevator Maintenance	4.4	Medium
7	Utilities	4.4	High
10	Energy-use Management	4.0	High
11	Energy-use Benchmarking	3.8	High





Power Quality Index Overview

Thank you for your interest in the electrical health of your building. The Power Quality Index (PQI) you are about to review is based on industry standard power quality measurements from IEEE1159, combined with years of expertise gained assessing data from hundreds of installations.

DATA REOURCES:

- All the calculations included in your report are explained in the *“Understanding Power Quality”* Whitepaper available for [review here](#).
- The 3rd-party references supporting the Whitepaper and Power Quality Index methodology are [available here](#).

The power quality score summarizes the current (AS IS) state of the building’s electrical health. This takes the complicated nature of long-term power quality metrics and distills it to an easy-to-understand rating.

A poor power quality score is a result of high variability in the power supplied to the facility and represents a clear opportunity to improve the building’s electrical health with resulting savings, reliability and occupant satisfaction gains.

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POWER QUALITY SCORECARD

123 Main St

Main Street Industries

123 Main St

Energy Waste - **\$17,545 / yr.**

- **20-year operating impact - \$580,141**
- **Annual Excess GHG emissions - 42 Metric Tons/ yr.**

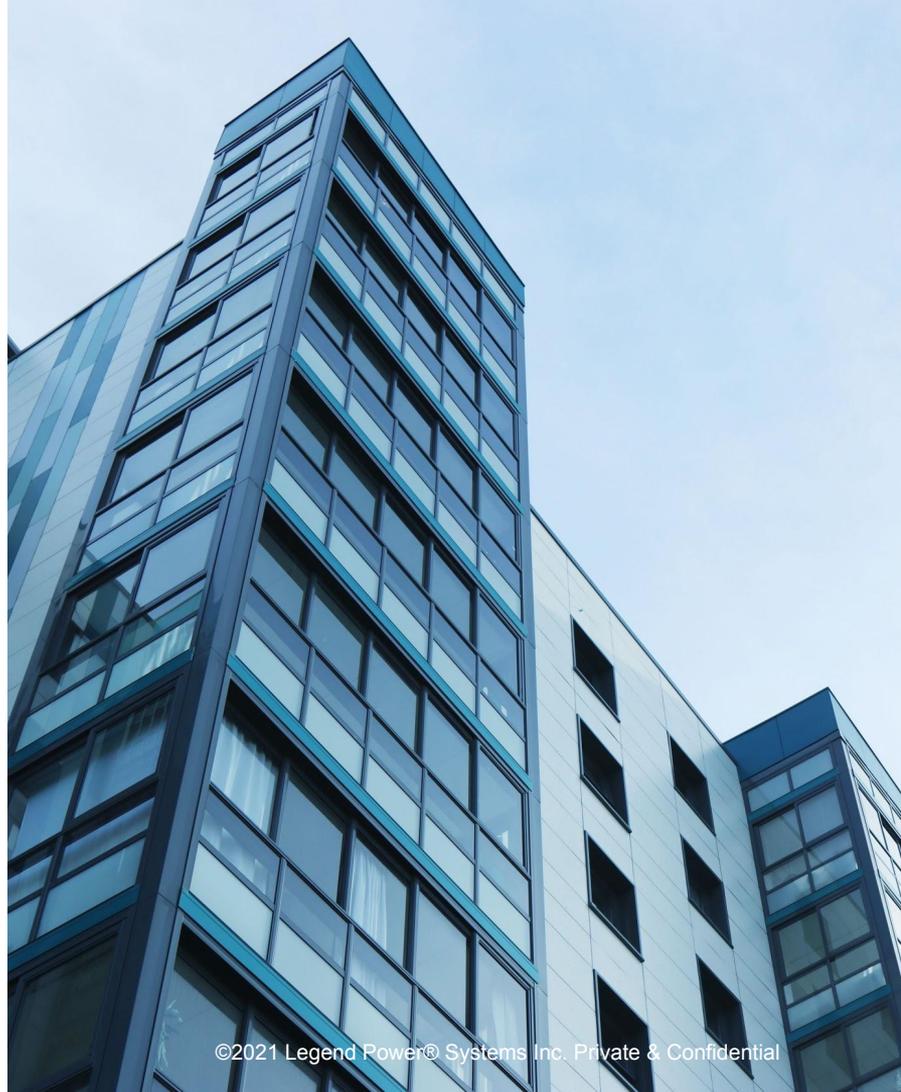
Legend Power monitored this facility in April and May 2021 and recorded both ongoing and periodic adverse electrical conditions. The **Power Quality Index™** summarizes the efficiency, lifetime, and reliability of the building's electrical system; a key asset in the operation of your facility. Improving your facility's electrical conditions will have a direct and immediate impact on your operational expenses through energy savings and reduced equipment interruption and/or replacement costs.



Critical 0.0 – 55 **Caution 56 – 84** **Good 85+**
Risk of premature equipment failure – decreased equipment lifetime up to
26% - 37%

Increased energy use – due to adverse power conditions
5.6% excess energy use **129,963 kWh / yr**
21.3 kW demand **42 metric ton GHG / yr**

Risk of service interruption – **706** discrete potentially damaging events projected annually



Efficiency - Critical

Persistent voltage levels above nominal utilization levels drive excess energy use *1,2,and 3



The Efficiency Index for power quality for 123 Main St is **Critical** relative to similar buildings. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

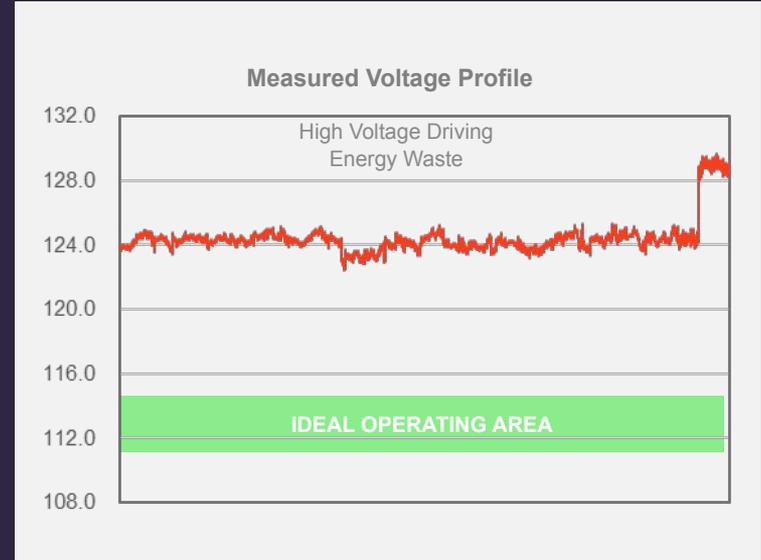
5.6% excess energy use

\$17,545 / yr. energy waste

129,963 kWh / yr.

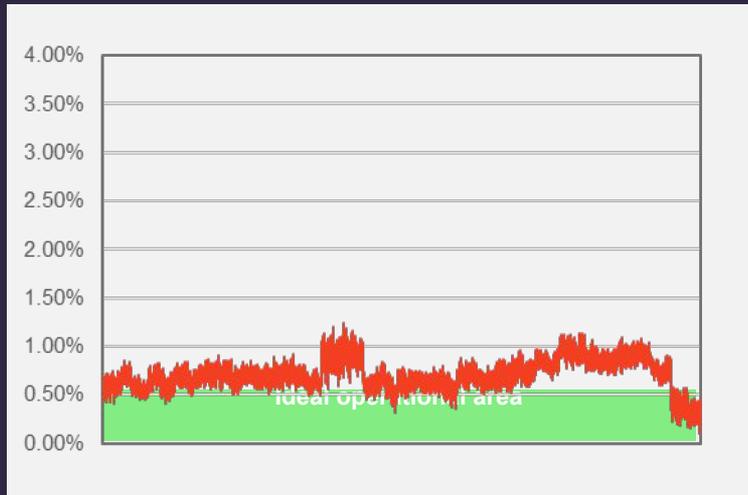
21.3 kW demand

42 Metric ton GHG / yr.



See Sources 1,2 and 3 for 3rd party validation

Phase Unbalance Profile



Maximum Phase Unbalance 1.24% Voltage Unbalance

Ongoing – Steady State 0.70% Voltage Unbalance

See Sources 4,5 and 6 for 3rd party validation

Lifetime - Critical

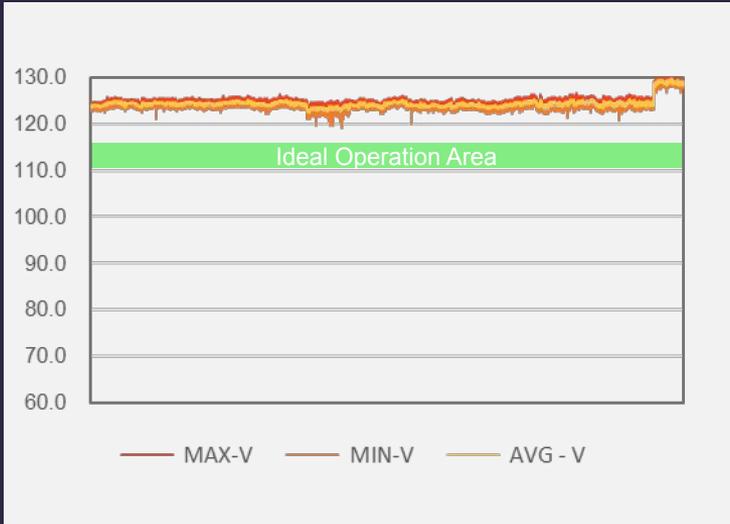
Poor phase balance leads to decreased energy efficiency, overheating and increased failure rates on equipment *4,5 and 6



The Lifetime Index for power quality for 123 Main St is **Critical** relative to similar buildings. Equipment at this facility will experience decreased lifetime and premature failure based on the adverse grid conditions observed at this facility which result in sustained high voltage and high frequency of adverse voltage events.

Risk of premature equipment failure – decreased equipment lifetime up to 26% - 37%

Voltage Min and Max



Measured Voltage (Average) **124.5 V**

Measured Max Voltage **130.1 V** Measured Minimum Voltage **119 V**

See Sources 7 & 8* for 3rd party validation

Reliability - Critical

Short-lived voltage excursions lead to equipment shutdown, service interruptions and increases the potential for critical equipment failure. *7,8



Risk of service interruption- **706** Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	876
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	593
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	113

The **Reliability Index** for power quality for 123 Main St is **Critical** relative to similar buildings. The equipment at this facility is currently more likely to experience unplanned interruptions or failures due to the highly volatile nature of the electrical power supplied at this building.

Short-term voltage events in the form of swells and transients can have damaging effects on VFDs and mechanical equipment. Managing your voltage levels with the SmartGATE™ Platform ensures you protect yourself from the inconvenience of equipment failure.

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POWER QUALITY SCORECARD

511 Birch Ave

Mixed Use Facility

511 Birch Ave

Energy Waste - **\$12,365 / yr**

- **20-year operating impact - \$408,861**
- **Annual Excess GHG emissions - 30 Metric Tons/ yr.**

Legend Power monitored this facility in April and May 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the efficiency, lifetime, and reliability of the building's electrical system; a key asset in the operation of your facility. Improving your facility's electrical conditions will have a direct and immediate impact on your operational expenses through energy savings and reduced equipment interruption and/or replacement costs.

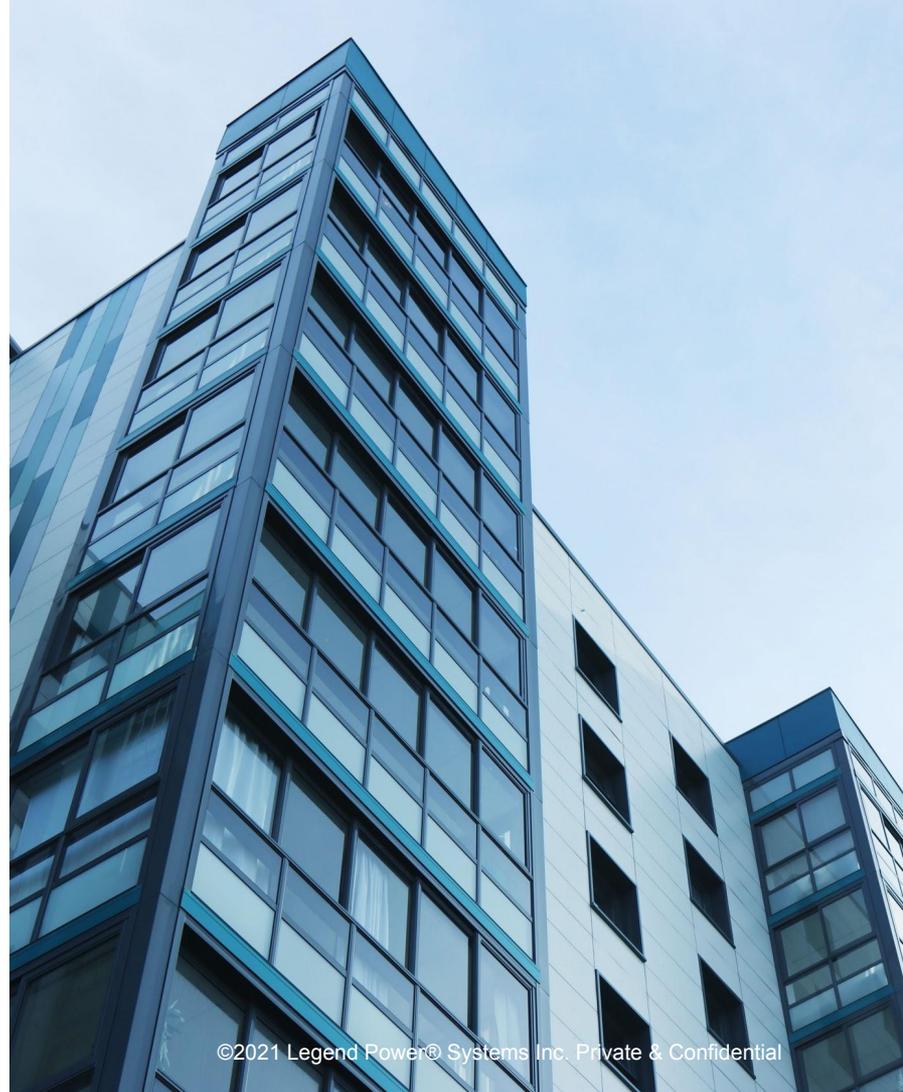


Critical 0.0 – 5.5 Risk of premature equipment failure – decreased equipment lifetime up to **25% - 37%**
Caution 5.6 – 8.4
Good 8.5+

Increased energy use – due to adverse power conditions

5.9% excess energy use **91,593 kWh / yr.**
15 kW demand **30 metric ton GHG / yr.**

Risk of service interruption – **706** discrete potentially damaging events projected annually



Efficiency - Critical

Persistent voltage levels above nominal utilization levels drive excess energy use *1,2,and 3



The Efficiency Index for power quality for 511 Birch Ave is **Critical** relative to similar buildings. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

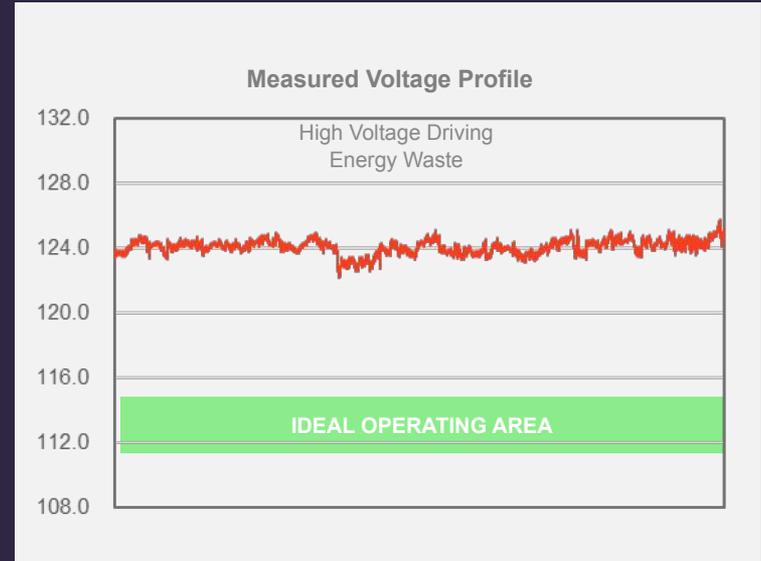
5.9% excess energy use

\$12,365 / yr. energy waste

91,593 kWh / yr.

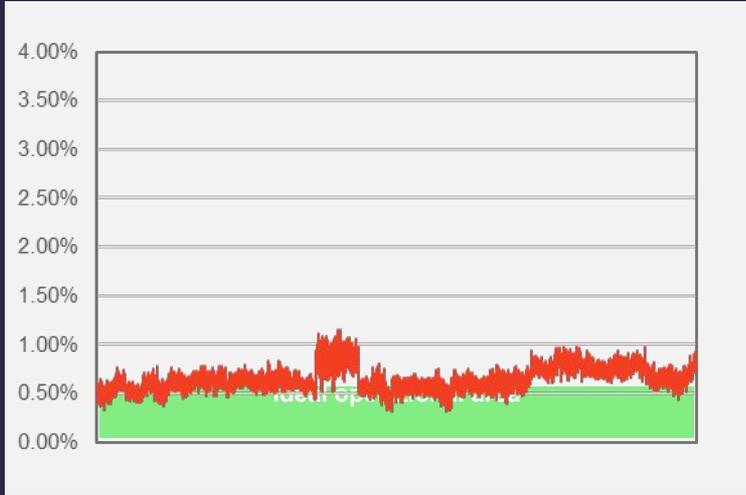
15 kW demand

30 Metric ton GHG / yr.



See Sources 1,2 and 3 for 3rd party validation

Phase Unbalance Profile



Maximum Phase Unbalance 1.16% Voltage Unbalance

Ongoing - Steady State 0.65% Voltage Unbalance

See Sources 4,5 and 6 for 3rd party validation

Lifetime - Critical

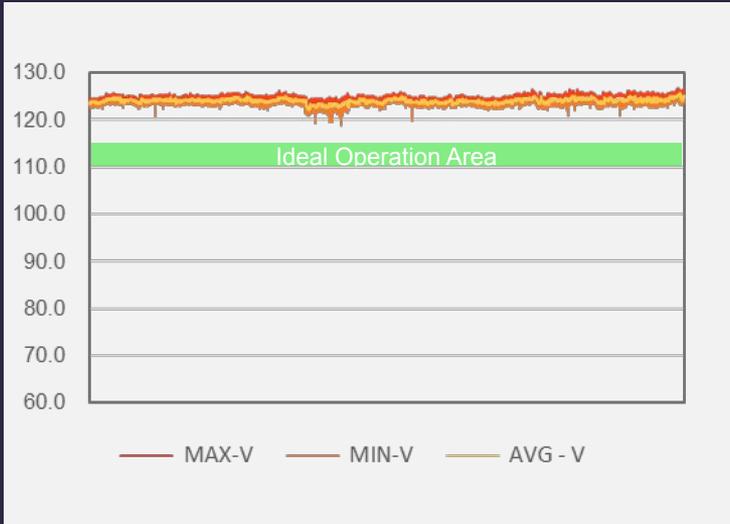
Poor phase balance leads to decreased energy efficiency, overheating and increased failure rates on equipment *4,5 and 6



The Lifetime Index for power quality for 511 Birch Ave is **Critical** relative to similar buildings. Equipment at this facility will experience decreased lifetime and premature failure based on the adverse grid conditions observed at this facility which result in sustained high voltage and high frequency of adverse voltage events.

Risk of premature equipment failure – decreased equipment lifetime up to 25% - 37%

Voltage Min and Max



Measured Voltage (Average) **124.1 V**

Measured Max Voltage **126.6 V** Measured Minimum Voltage **119 V**

See Sources 7 & 8* for 3rd party validation

Reliability - Critical

Short-lived voltage excursions lead to equipment shutdown, service interruptions and increases the potential for critical equipment failure. *7,8



Risk of service interruption- **706** Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	876
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	593
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	113

The **Reliability Index** for power quality for 511 Birch Ave is **Critical** relative to similar buildings. Equipment at this facility is currently more likely to experience unplanned interruptions or failures due to the highly volatile nature of the electrical power supplied at this building.

Short-term voltage events in the form of swells and transients can have damaging effects on VFDs and mechanical equipment. Managing your voltage levels with the SmartGATE™ Platform ensures you protect yourself from the inconvenience of equipment failure.

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POWER QUALITY SCORECARD

721 Valley St

Multi-Family Building

721 Valley St

Energy Waste - **\$16,385 / yr.**

- **20-year operating impact - \$511,143**
- **Annual Excess GHG emissions – 15 Metric Tons/ yr.**

Legend Power monitored this facility in April and May 2021 and recorded both ongoing and periodic adverse electrical conditions. The **Power Quality Index™** summarizes the efficiency, lifetime, and reliability of the building's electrical system; a key asset in your operation of your facility. Improving your facility's electrical conditions will have a direct and immediate impact on your operational expenses through energy savings and reduced equipment interruption and/or replacement costs.

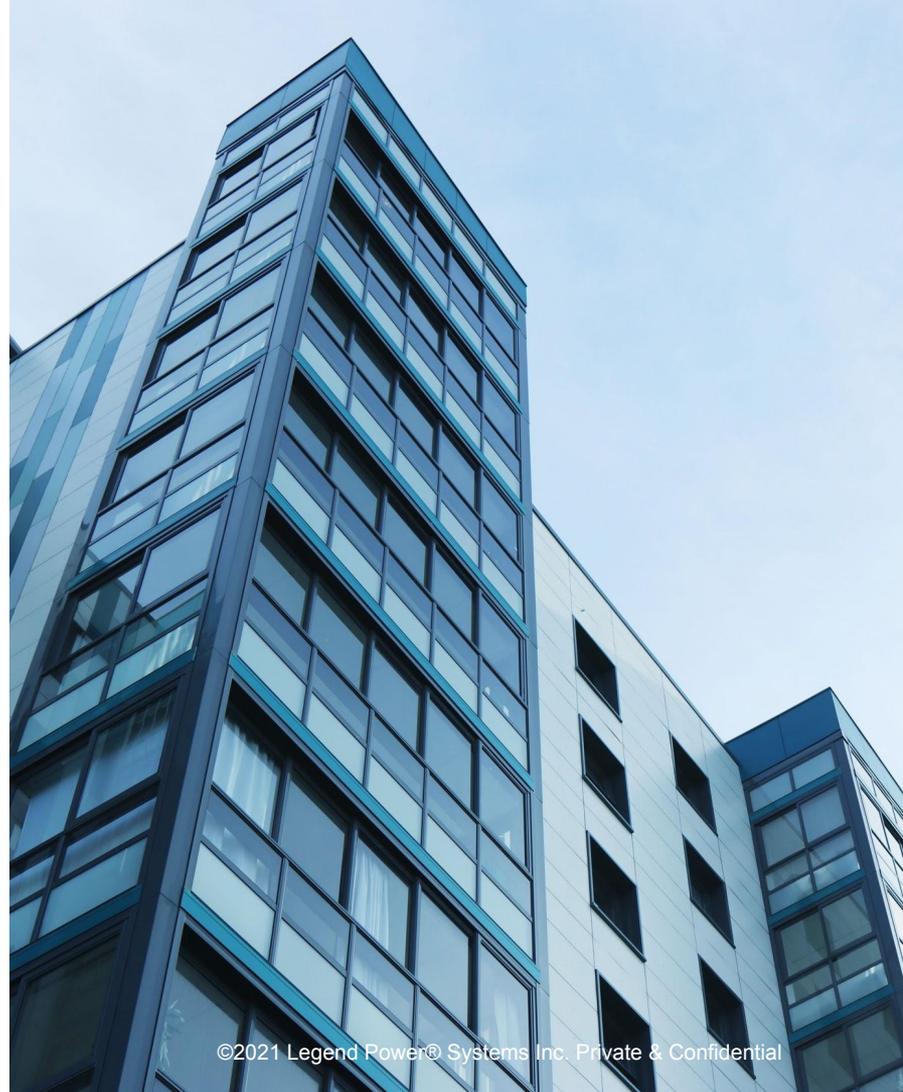


Critical 0.0 – 5.5 Risk of premature equipment failure – decreased equipment lifetime up to **26% - 37%**
Caution 5.6 – 8.4
Good 8.5+

Increased energy use – due to adverse power conditions

4.4% excess energy use **47,300 kWh / yr.**
17.6 kW demand **15 metric tons GHG / yr.**

Risk of service interruption – **21** discrete potentially damaging events projected annually



Efficiency - Critical

Persistent voltage levels above nominal utilization levels drive excess energy use *1,2 and 3



The Efficiency Index for power quality for 721 Valley St feed is **Critical** relative to similar buildings. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

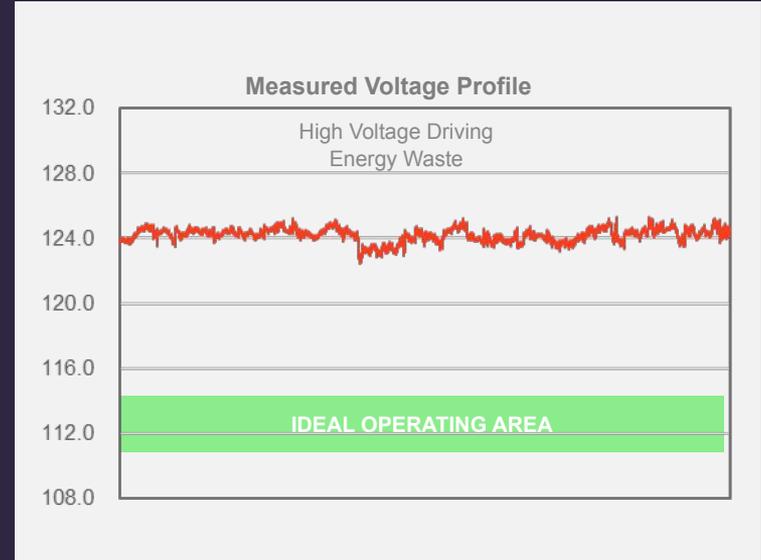
4.4% excess energy use

\$16,385 / yr. energy waste

47,300 kWh / yr.

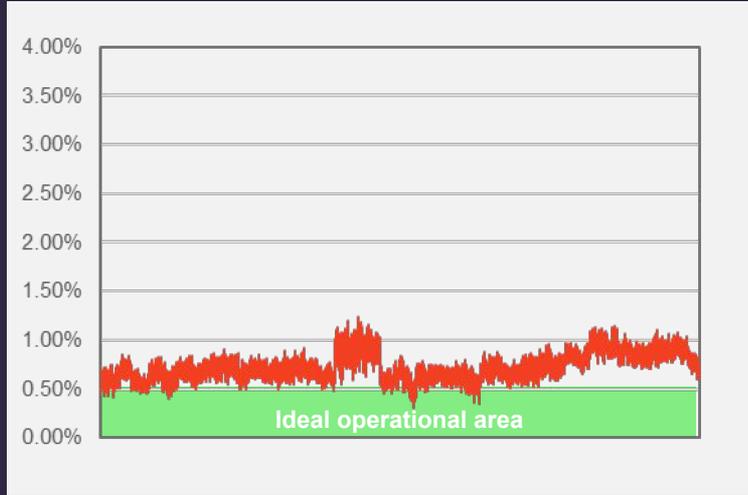
17.6 kW demand

15 Metric tons GHG / yr.



See Sources 1,2 and 3 for 3rd party validation

Phase Unbalance Profile



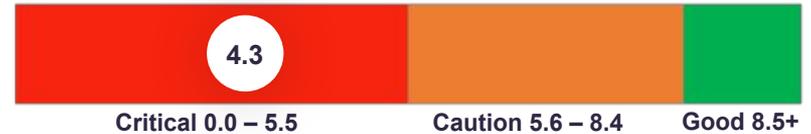
Maximum Phase Unbalance 1.24% Voltage Unbalance

Ongoing – Steady State 0.72% Voltage Unbalance

See Sources 4,5 and 6 for 3rd party validation

Lifetime - Critical

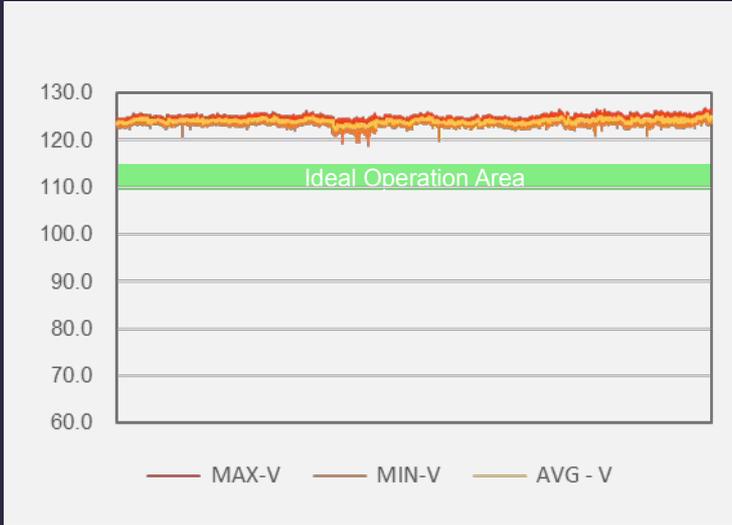
Poor phase balance leads to decreased energy efficiency, overheating and increased failure rates on equipment *4,5 and 6



The Lifetime Index for power quality for 721 Valley St feed is **Critical** relative to similar buildings. Equipment at this facility will experience decreased lifetime and premature failure based on the adverse grid conditions observed at this facility which result in sustained high voltage and high frequency of adverse voltage events.

Risk of premature equipment failure – decreased equipment lifetime up to 26% - 37%

Voltage Min and Max



Measured Voltage (Average) **124.2 V**

Measured Max Voltage **126.5 V** Measured Minimum Voltage **119 V**

See Sources 7 & 8* for 3rd party validation

Reliability – Critical

Short-lived voltage excursions lead to equipment shutdown, service interruptions and increases the potential for critical equipment failure. *7,8



Risk of service interruption- 21 Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	26
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	18
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	3

The **Reliability Index** for power quality for 721 Valley St feed is **Critical** relative to similar buildings. Equipment at this facility is currently more likely to experience unplanned interruptions or failures due to the highly volatile nature of the electrical power supplied at this building.

Short-term voltage events in the form of swells and transients can have damaging effects on VFDs and mechanical equipment. Managing your voltage levels with the SmartGATE™ Platform ensures you protect yourself from the inconvenience of equipment failure.

Sources

1. Marc Diaz-Aguiló, Julien Sandraz, Richard Macwan, Francisco de León, Dariusz Czarkowski, Christopher Comack, and David Wang, “Field-Validated Load Model for the Analysis of CVR in Distribution Secondary Networks: Energy Conservation” *IEEE TRANSACTIONS ON POWER DELIVERY*, VOL. 28, NO. 4, OCTOBER 2013
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8. “Voltage Sag Prediction Model Using Distribution Power Quality Phase II Data”, EPRI. 1002199 Final Report, December 2003



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