



MAKING BUILDINGS BETTER

Power Impact Report

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Executive Summary

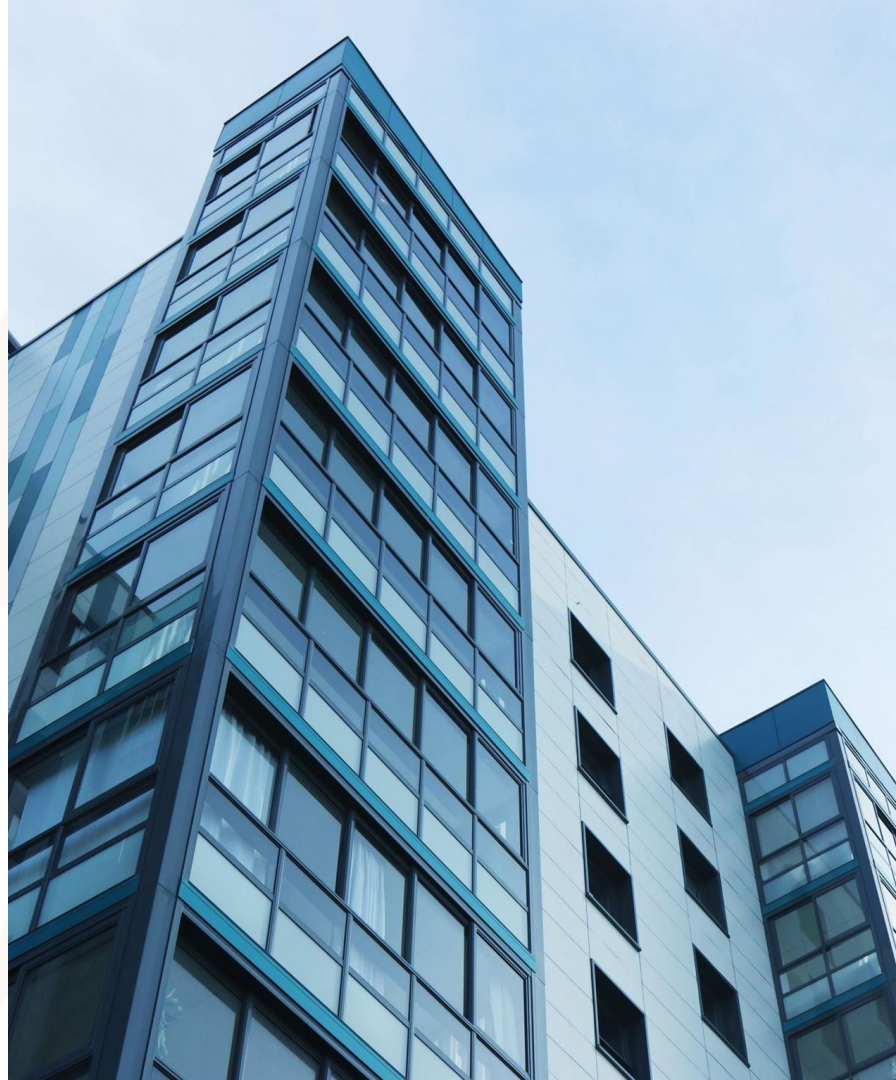
Estimated **20-year** energy savings for these 7 feeds: **\$1,996,664**

Estimated Average Risk Mitigation of **23% to 36%**

20-year excess GHG emissions: **460 MT**

Elimination of 8,300 power events over 20 years to increase system performance, occupant satisfaction and revenue while reducing expenses.

Legend Power monitored these facilities during March 2021, and recorded both ongoing and periodic, adverse electrical conditions. This Risk and Loss Report summarizes the reliability, efficiency, and lifetime 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 revenue through increased satisfaction rates, increased profitability through lower operating expenses through energy savings and reduced equipment interruption and/or replacement costs.





Power Impact Report



Introduction

The Legend Power® PIR is designed to create visibility to the full impact 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™ (more 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 hurting your buildings performance – and then fix it through 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 system 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 takes your actual power data and projects the impact to 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 drives 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 2.5 - 4.0% 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- 5



Building	Overall PQ Index 10-High, 1-Low	Energy Waste & Inefficiency	Decreased Life Expectancy	Annual Moderate / Severe Events
City Hall Meter A	7.5	2.7%	23% - 33%	42
City Hall Meter B	5.3	2.9%	23% - 34%	304
Police Station	5.8	2.9%	25% - 36%	14
Elementary School	7.2	2.1%	23% - 33%	40
Elementary School	5.2	2.9%	23% - 33%	30
K-8 School	Insight Not Run -	3.9%	Insight Not Run	
Private 7-12 School	Systems Unavailable	3.6%	Systems Unavailable	

Risk & Loss Distribution

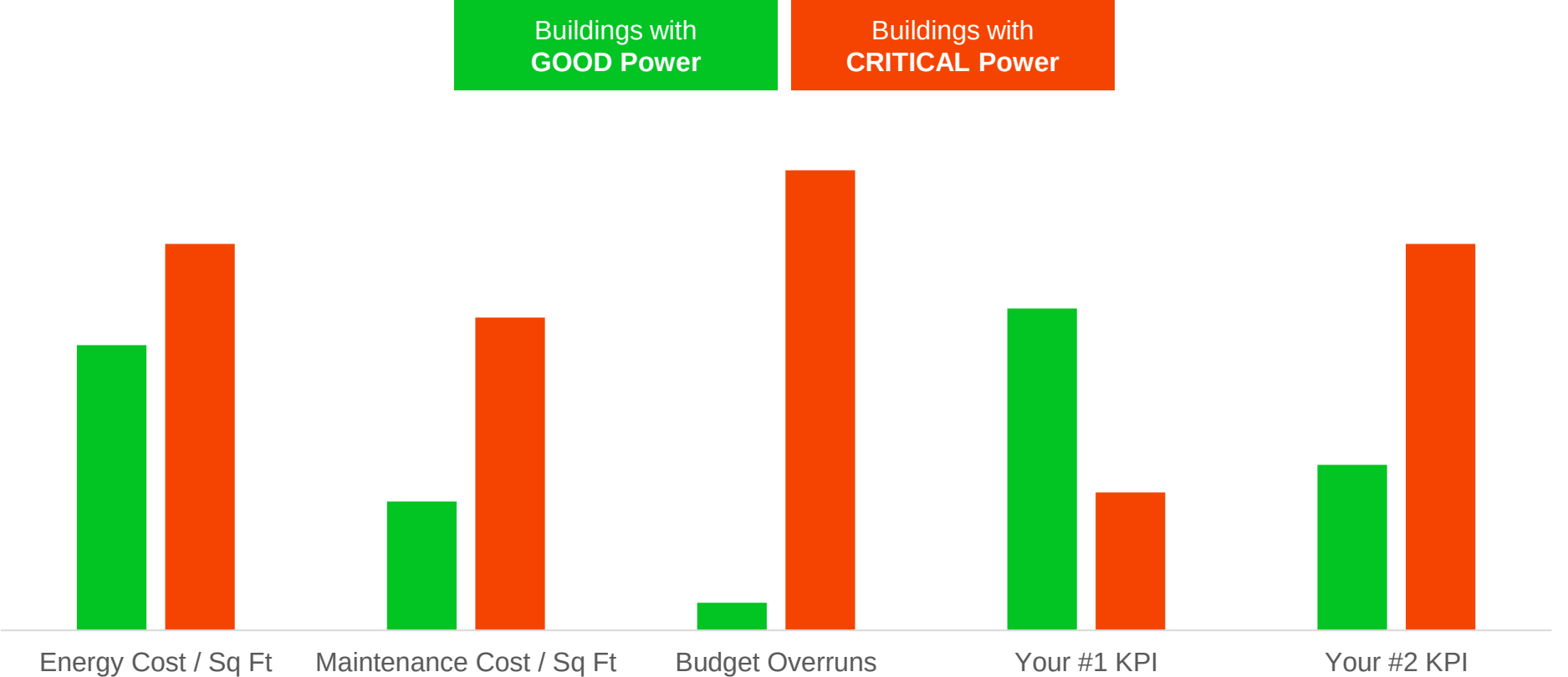
There is a significant financial loss due to increased repair and maintenance costs and wasted energy. When systems malfunction or fail, they have exponential impact. Not only do you pay to repair or replace the equipment, but it impacts the people who depend on your building.

The risk of premature major system failure is 23% - 36% 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	
City Hall Meter A	7.5	➡ 10.0	2.7%	\$11,490	19% - 27%	42	➡ 2
City Hall Meter B	5.3	➡ 9.9	2.9%	\$19,526	19% - 28%	304	➡ 8
Police Station	5.8	➡ 9.8	2.9%	\$1,394	21% - 30%	14	➡ 2
Elementary School	7.2	➡ 9.2	2.1%	\$2,591	19% - 27%	40	➡ 2
Elementary School	5.2	➡ 9.1	2.9%	\$4,796	19% - 27%	30	➡ 1
K-8 School	Insight Not Run - Systems Unavailable		3.9%	\$12,999	Insight Not Run - Systems Unavailable		
Private 7-12 School			3.6%	\$7,588			

Risk & Loss Mitigation

By implementing the SmartGATE™ platform you can expect dramatic improvement in top areas that improve system uptime. Better uptime drives more revenue at a lower cost, improving profitability and corporate valuations.

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 7 feeds:
\$1,996,664

Estimated average Risk Mitigation of 23% -36%

20-year excess GHG emissions: 460 MT

Elimination of 8,300 power events over 20 years to increase system lifetime & performance, occupant satisfaction and revenue



MAKING BUILDINGS BETTER

Power Quality Scorecard

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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 RESOURCES:

- All of the calculations included in your report are explained in ***“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 wins.

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POWER QUALITY SCORECARD

Major North East City
City Hall Meter A

Major North East City

City Hall Meter A

Energy Waste - **\$11,490 / yr**

- **20-year operating impact - \$379,928**
- **Annual Excess GHG emissions - 3 MT / yr**

Legend Power monitored this facility in March 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the reliability, efficiency and lifetime 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.

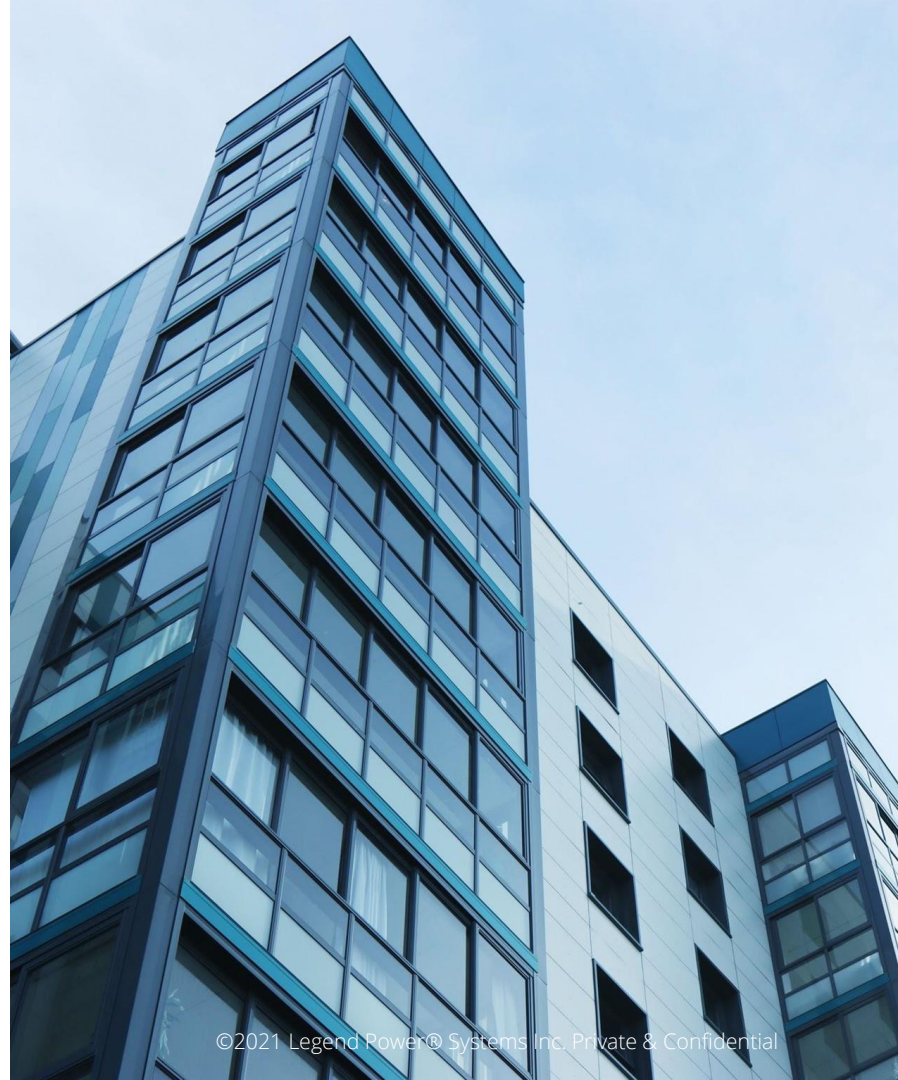


Risk of premature equipment failure – decreased equipment lifetime up to **23% - 33%**

Increased energy use – due to adverse power conditions

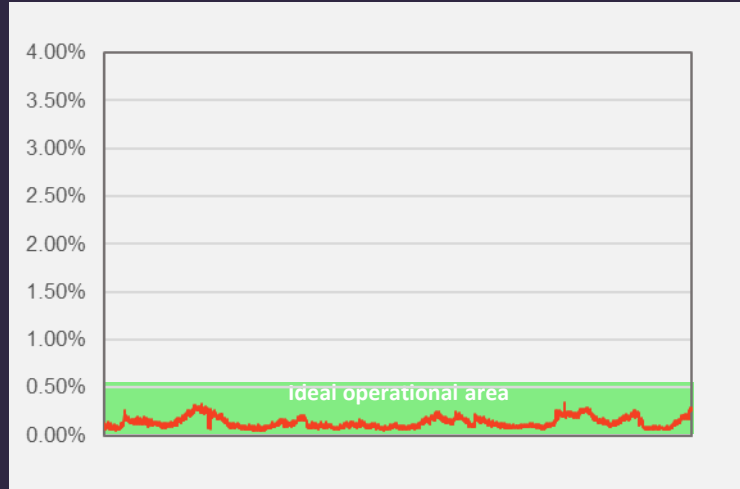
2.7% excess energy use **63,833 kWh / yr**
6.6 kW demand **3 MT GHG / yr**

Risk of service interruption – **42** discrete potentially damaging events projected annually



City Hall Meter A

Phase Unbalance Profile



Maximum Phase Unbalance 0.34% Voltage Unbalance

Ongoing – Steady State 0.13% Voltage Unbalance

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

Lifetime - Caution

*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 City Hall Meter A is **Caution** relative to similar buildings in the area. 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 23% - 33%

City Hall Meter A

Efficiency - Critical

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



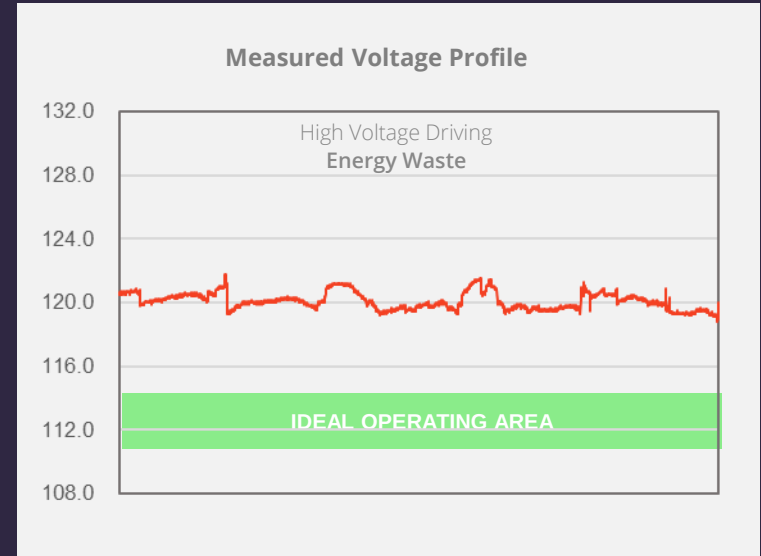
The Efficiency Index for power quality for City Hall Meter A is **Critical** relative to similar buildings in the area. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

2.7% excess energy use

63,833 kWh / yr

6.6 kW demand

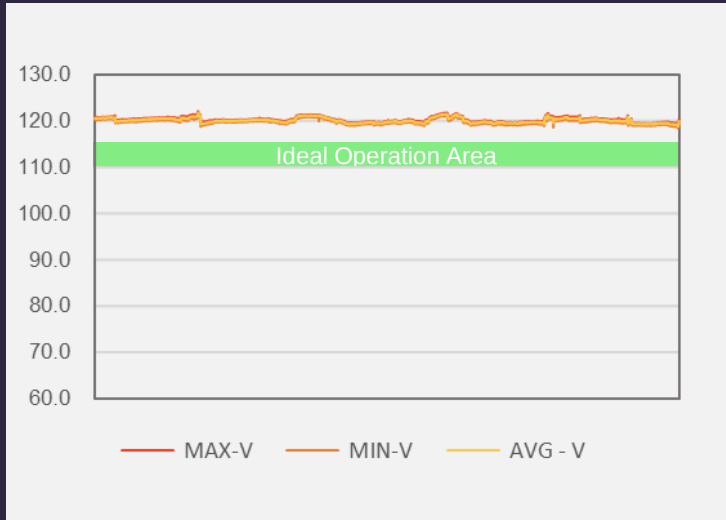
3 MT GHG / yr



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

City Hall Meter A

Voltage Min and Max



Measured Voltage (Average) **120.1 V**

Measured Max Voltage **122.1 V** Measured Minimum Voltage **118.4 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- 42 Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	52
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	35
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	7

The **Reliability Index** for power quality for City Hall Meter A is **Critical** relative to similar buildings in the area. 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

Major North East City
City Hall Meter B

Major North East City

City Hall Meter B

Energy Waste - **\$19,526 / yr**

- **20-year operating impact - \$645,641**
- **Annual Excess GHG emissions - 5 MT / yr**

Legend Power monitored this facility in March 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the reliability, efficiency and lifetime 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.

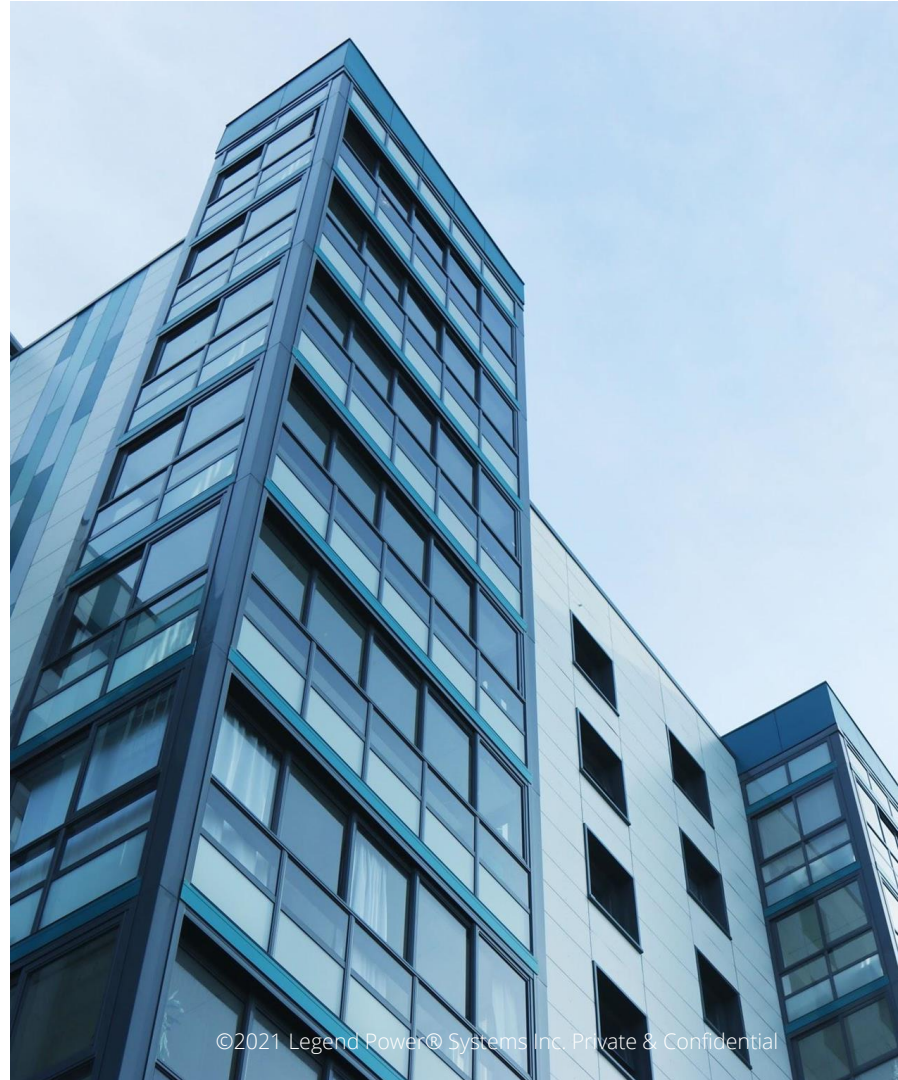


Risk of premature equipment failure – decreased equipment lifetime up to **23% - 34%**

Increased energy use – due to adverse power conditions

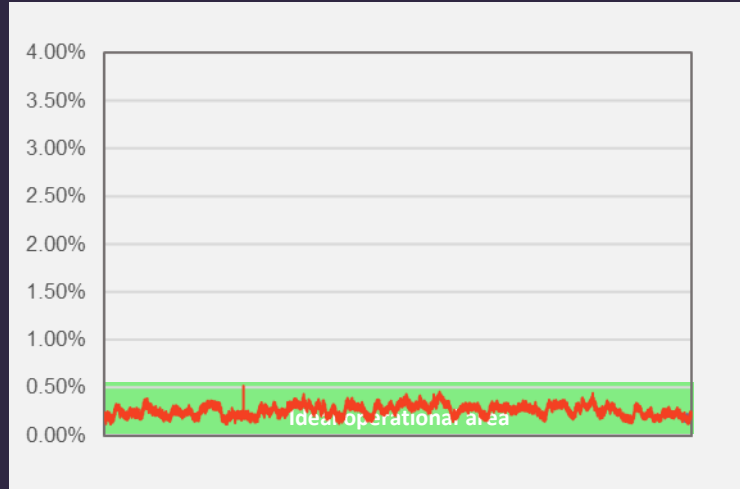
2.9% excess energy use **108,477 kWh / yr**
13.7 kW demand **5 MT GHG / yr**

Risk of service interruption – **304** discrete potentially damaging events projected annually



City Hall Meter B

Phase Unbalance Profile



Maximum Phase Unbalance 0.52% Voltage Unbalance

Ongoing – Steady State 0.26% Voltage Unbalance

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

Lifetime - Caution

*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 City Hall Meter B Feed is **Caution** relative to similar buildings in the area. 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 23% - 34%

City Hall Meter B

Efficiency - Critical

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



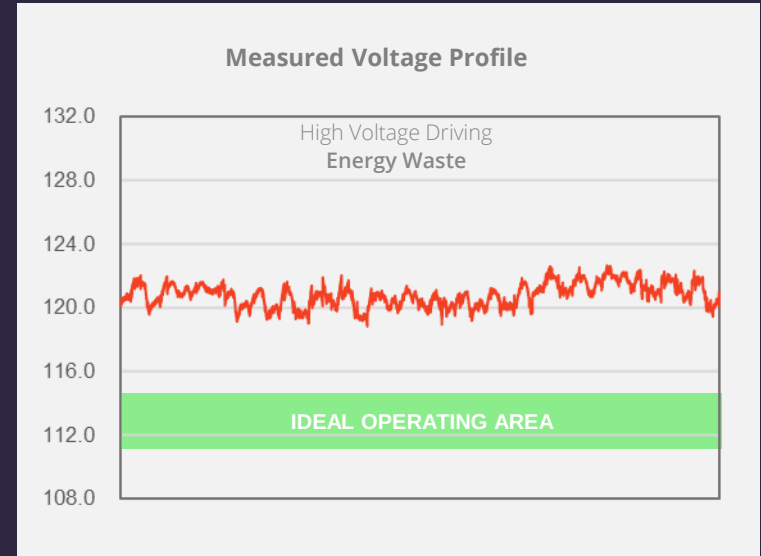
The Efficiency Index for power quality for City Hall Meter B Feed is **Critical** relative to similar buildings in the area. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

2.9% excess energy use

108,477 kWh / yr

13.7 kW demand

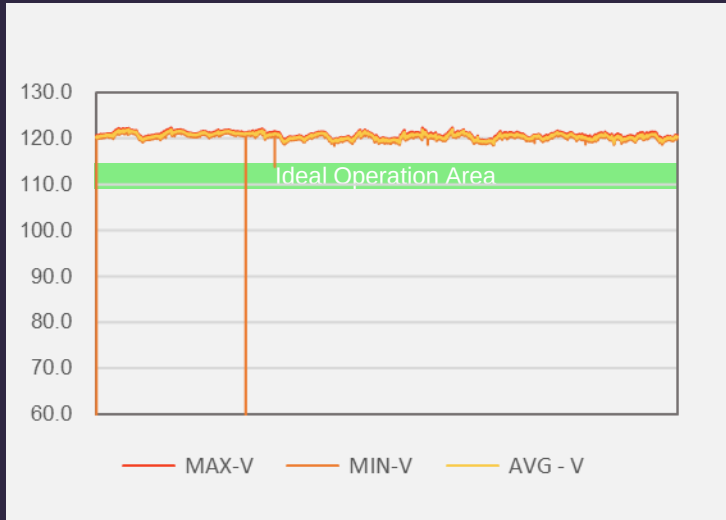
5 MT GHG / yr



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

City Hall Meter B

Voltage Min and Max



Measured Voltage (Average) **120.8 V**

Measured Max Voltage **123.7 V** Measured Minimum Voltage **17.4 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- 304 Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	377
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	255
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	49

The **Reliability Index** for power quality for City Hall Meter B feed is **Critical** relative to similar buildings in the area. 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

Major North East City
Police Station

Major North East City

Police Station

Energy Waste - **\$1,394 / yr**

- **20-year operating impact - \$46,102**
- **Annual Excess GHG emissions - 1 MT / yr**

Legend Power monitored this facility in March 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the reliability, efficiency and lifetime 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.

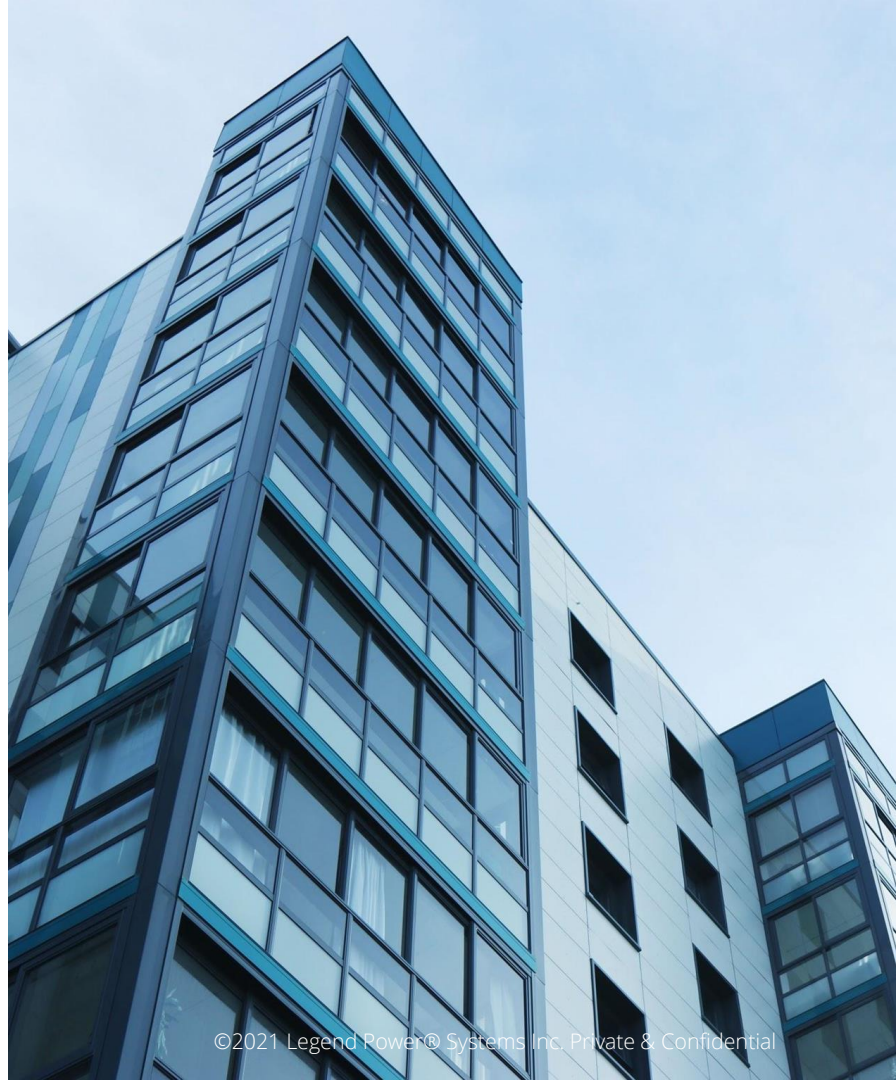


Risk of premature equipment failure – decreased equipment lifetime up to **25% - 36%**

Increased energy use – due to adverse power conditions

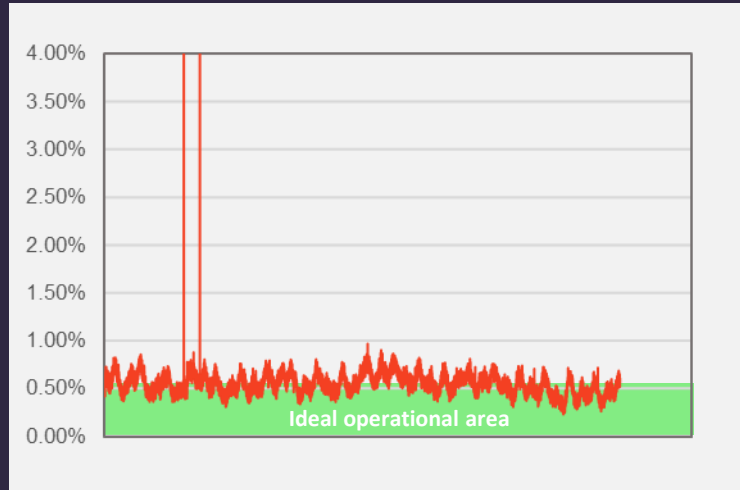
2.9% excess energy use **7,746 kWh / yr**
12.9 kW demand **1 MT GHG / yr**

Risk of service interruption – **14** discrete potentially damaging events projected annually



Police Station

Phase Unbalance Profile



Maximum Phase Unbalance 100.43% Voltage Unbalance

Ongoing – Steady State 0.55% Voltage Unbalance

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

Lifetime - Caution

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 Police Station Feed is **Caution** relative to similar buildings in the area. 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% - 36%

Efficiency - Critical

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



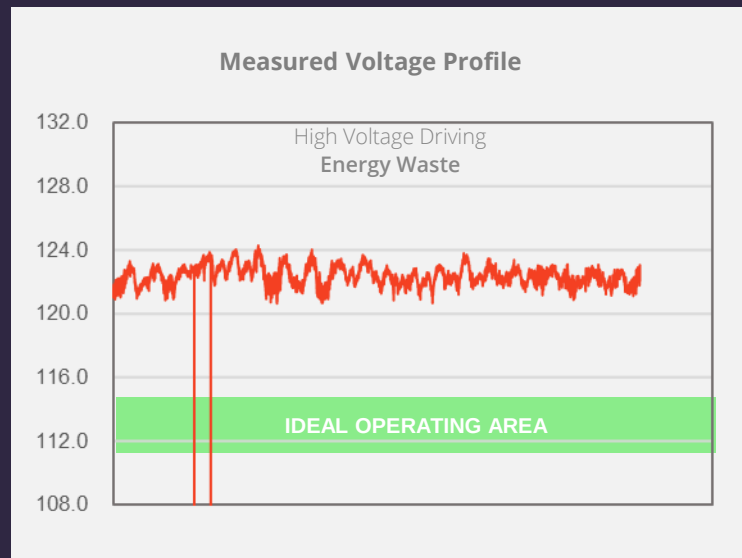
The Efficiency Index for power quality on the Police Station Feed is **Critical** relative to similar buildings in the area. This will result in higher than necessary energy bills and operating costs due to sustained high voltage and poor phase balance.

2.9% excess energy use

7,746 kWh / yr

12.9 kW demand

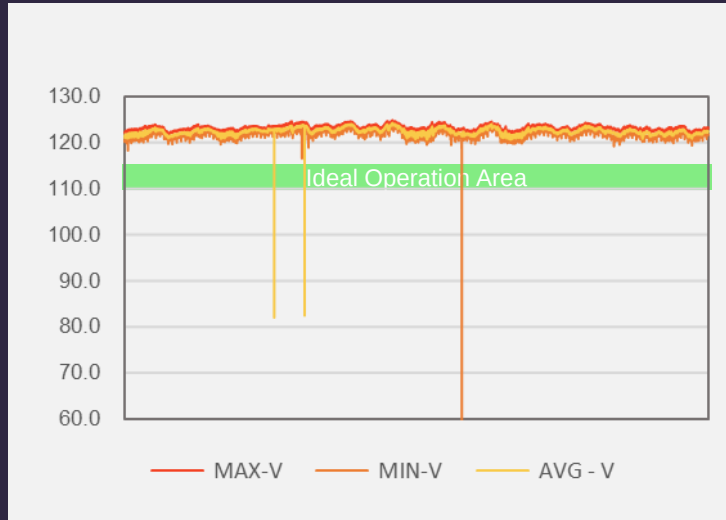
1 MT GHG / yr



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

Police Station C6

Voltage Min and Max



Measured Voltage (Average) **122.4 V**

Measured Max Voltage **125.0 V** Measured Minimum Voltage **80.2 V**

See Sources 7 & 8 * for 3rd party validation

Reliability – Caution

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



Risk of service interruption- **14** Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	18
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	12
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	2

The **Reliability Index** for power quality for Police Station feed is **Caution** relative to similar buildings in the area. 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

Major North East City
Elementary School

Major North East City

Elementary School

Energy Waste - **\$2,591 / yr**

- **20-year operating impact - \$85,676**
- **Annual Excess GHG emissions - 5 MT / yr**

Legend Power monitored this facility in March 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the reliability, efficiency and lifetime 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.

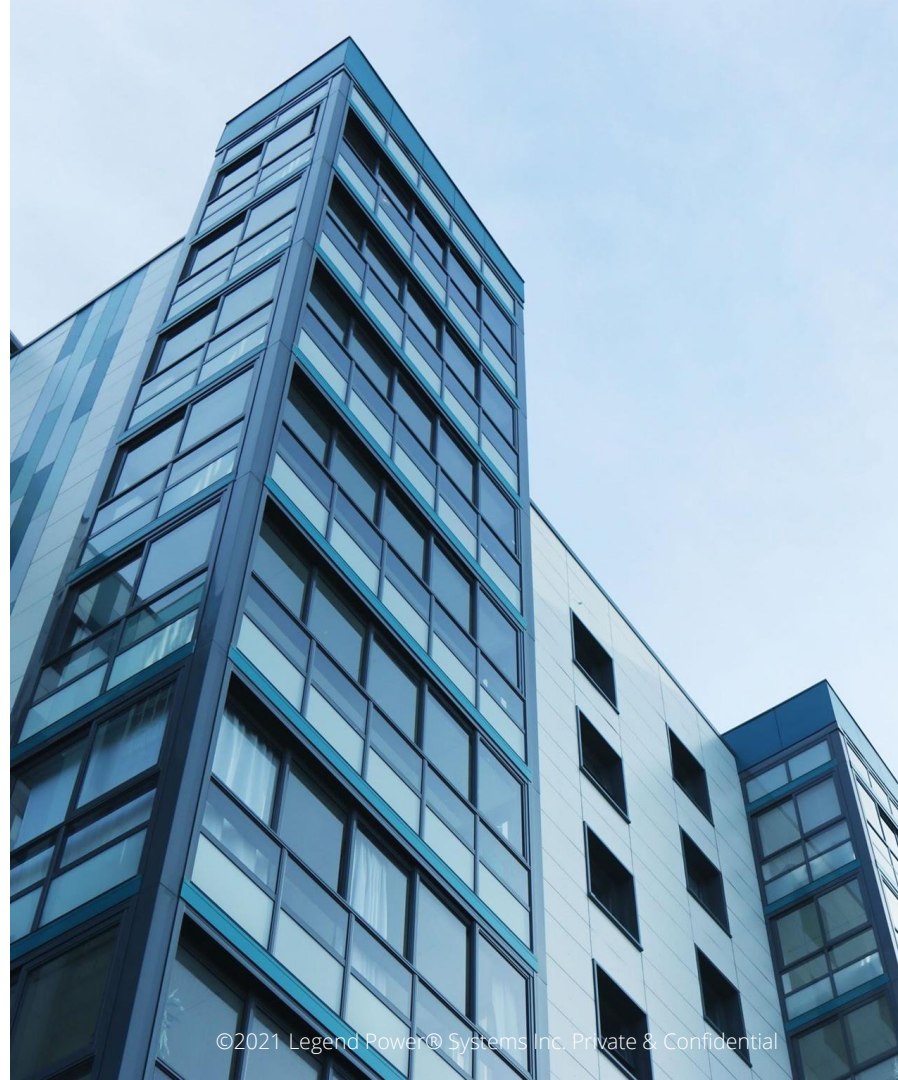


Risk of premature equipment failure – decreased equipment lifetime up to **23% - 33%**

Increased energy use – due to adverse power conditions

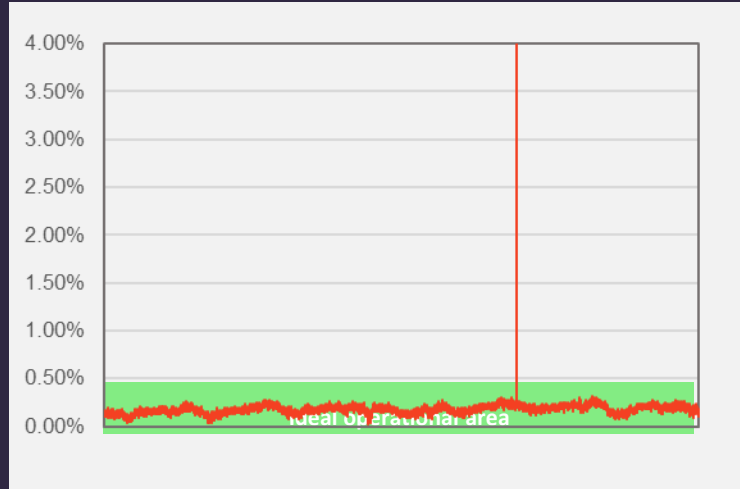
2.1% excess energy use **14,395 kWh / yr**
3.1 kW demand **5 MT GHG / yr**

Risk of service interruption – **40** discrete potentially damaging events projected annually



Elementary School

Phase Unbalance Profile



Maximum Phase Unbalance 100.43% Voltage Unbalance

Ongoing – Steady State 0.19% Voltage Unbalance

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

Lifetime - Caution

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 the Elementary School feed is **Caution** relative to similar buildings in the area. 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 23% - 33%

Efficiency - Critical

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

1.9

Critical 0.0 – 5.5

Caution 5.6 – 8.4

Good 8.5+

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

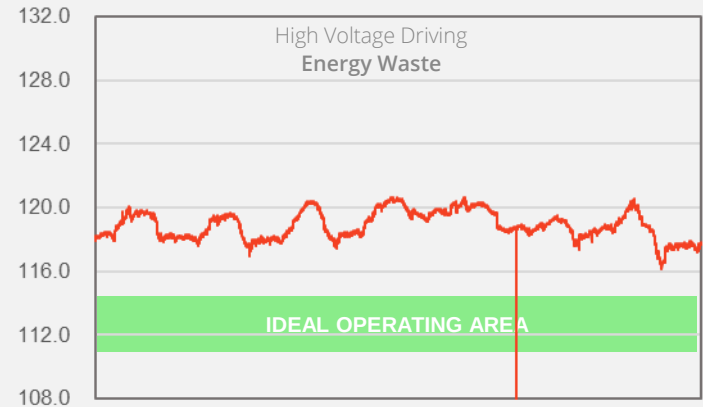
2.1% excess energy use

14,395 kWh / yr

3.1 kW demand

5 MT GHG / yr

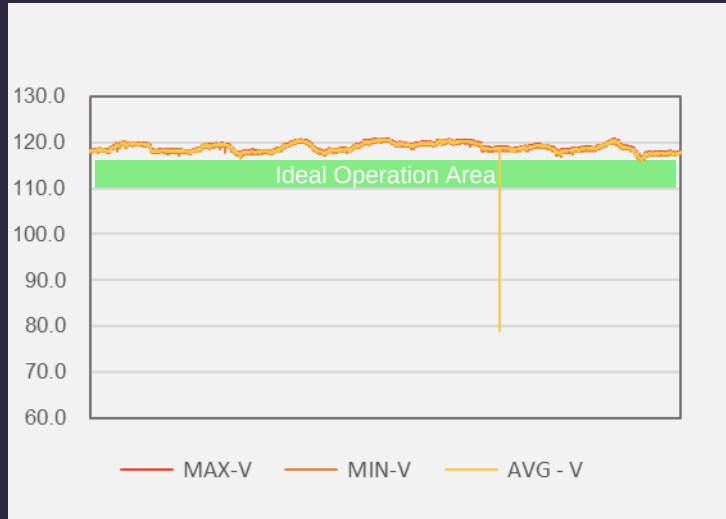
Measured Voltage Profile



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

Elementary School

Voltage Min and Max



Measured Voltage (Average) **118.9 V**

Measured Max Voltage **120.9 V** Measured Minimum Voltage **79.3 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- 40 Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	50
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	34
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	6

The **Reliability Index** for power quality for the Elementary School feed is **Critical** relative to similar buildings in the area. 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

Major North East City
Elementary School

Major North East City

Elementary School

Energy Waste – 4,796 /yr

- 20-year operating impact - \$158,589
- Annual Excess GHG emissions - 9 MT / yr

Legend Power monitored this facility in March 2021 and recorded both ongoing and periodic, adverse electrical conditions. The **Power Quality Index™** summarizes the reliability, efficiency and lifetime 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.

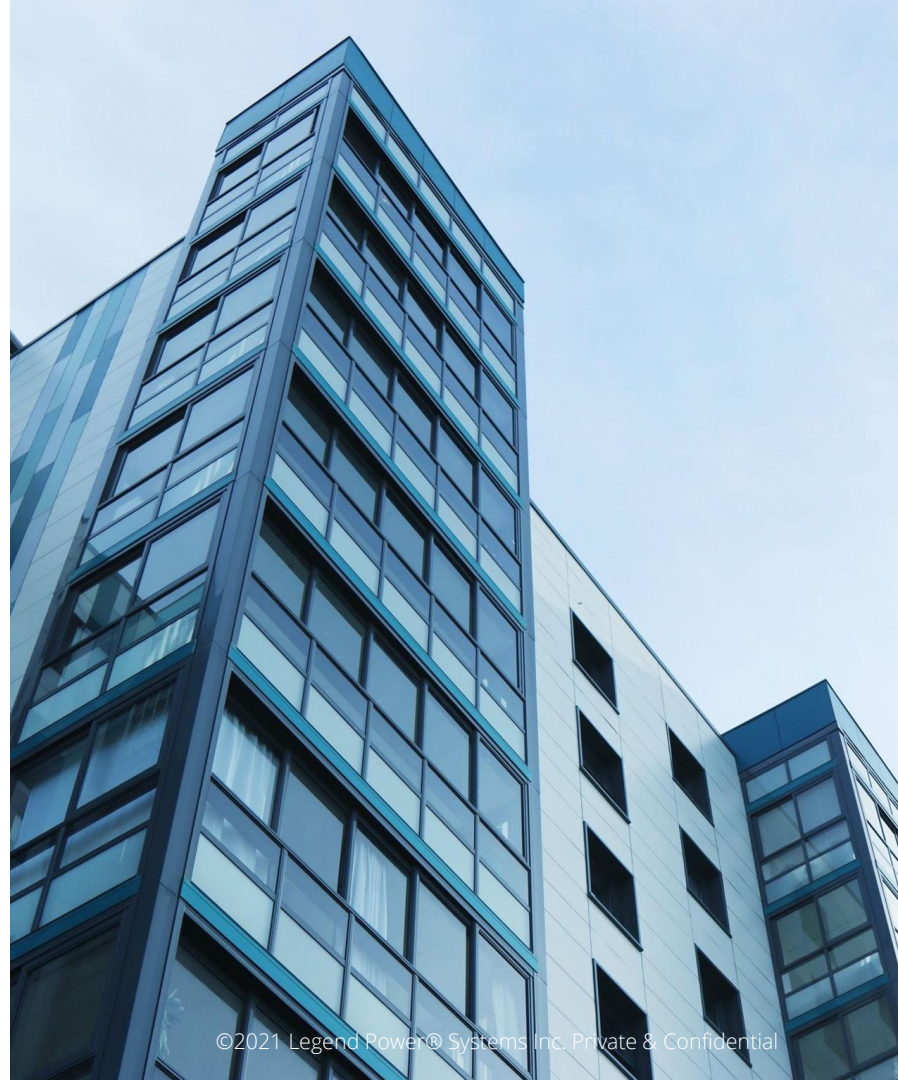


Risk of premature equipment failure – decreased equipment lifetime up to 23% - 33%

Increased energy use – due to adverse power conditions

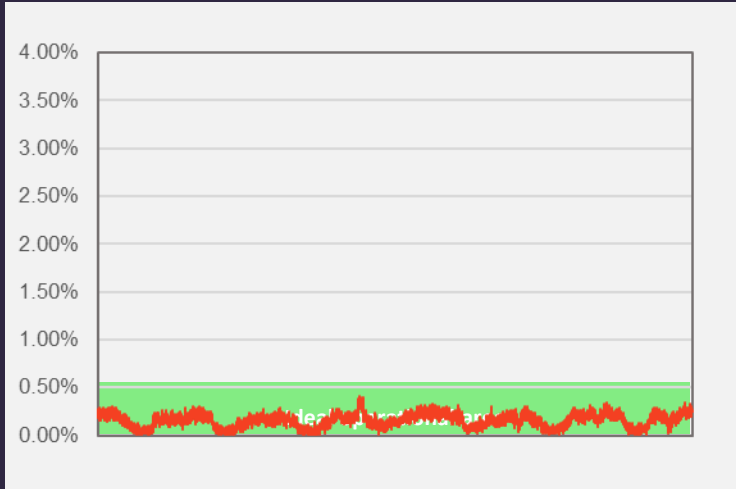
2.9% excess energy use 26,645 kWh / yr
5.8 kW demand 9 MT GHG / yr

Risk of service interruption – 30 discrete potentially damaging events projected annually



Elementary School

Phase Unbalance Profile



Maximum Phase Unbalance **0.41% Voltage Unbalance**

Ongoing – Steady State **0.16% Voltage Unbalance**

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

Lifetime - Caution

*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 the Murphy K-8 School Feed is **Caution** relative to similar buildings in the area. 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 23% - 33%

Efficiency - Critical

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



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

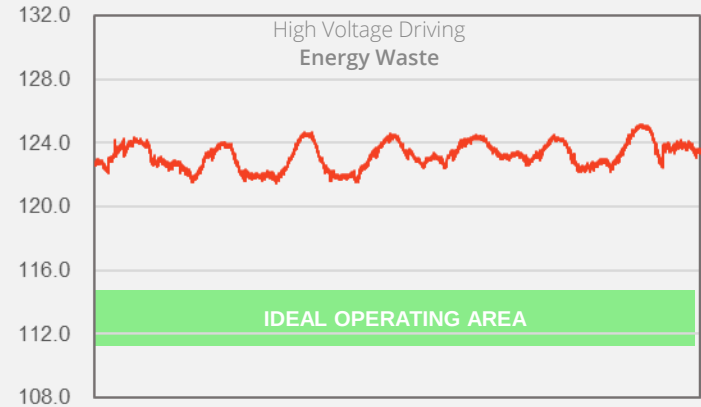
2.9% excess energy use

26,645 kWh / yr

5.8 kW demand

9 MT GHG / yr

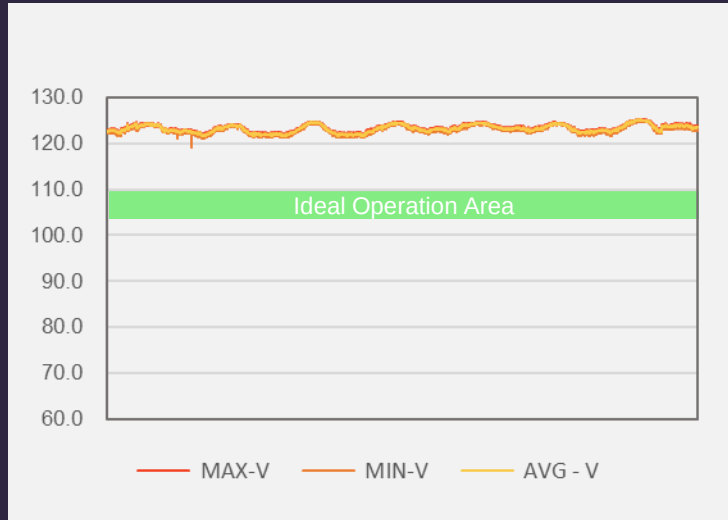
Measured Voltage Profile



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

Elementary School

Voltage Min and Max



Measured Voltage (Average) **123.2 V**

Measured Max Voltage **125.3 V** Measured Minimum Voltage **119.0 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- 30 Projected energy events annually

Type	Impact	Annual Projection
Mild	Flickering lights, sensitive equipment reset, loss of data, nuisance alarms and warnings	30
Moderate	Shutdown and reset of sensitive equipment such as fire alarm panels, Elevator controls and HVAC systems	21
Severe	Widespread shutdown of electrical equipment, potential damage to critical systems	9

The **Reliability Index** for power quality for the Elementary School feed is **Critical** relative to similar buildings in the area. 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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