

Engineered for a Secure Future



Optimizing Industrial Efficiency through Level 2 Energy Audit

A leading global carriageenan supplier, sought to refine its operational efficiency and reduce its carbon footprint. While the facility had initiated energy initiatives as early as 2020, they required a sophisticated, data-driven roadmap to identify further savings. The primary challenge was to analyze a high-output production environment—processing over 3.1 million kilograms of product annually—and find specific, cost-effective areas for technical intervention.

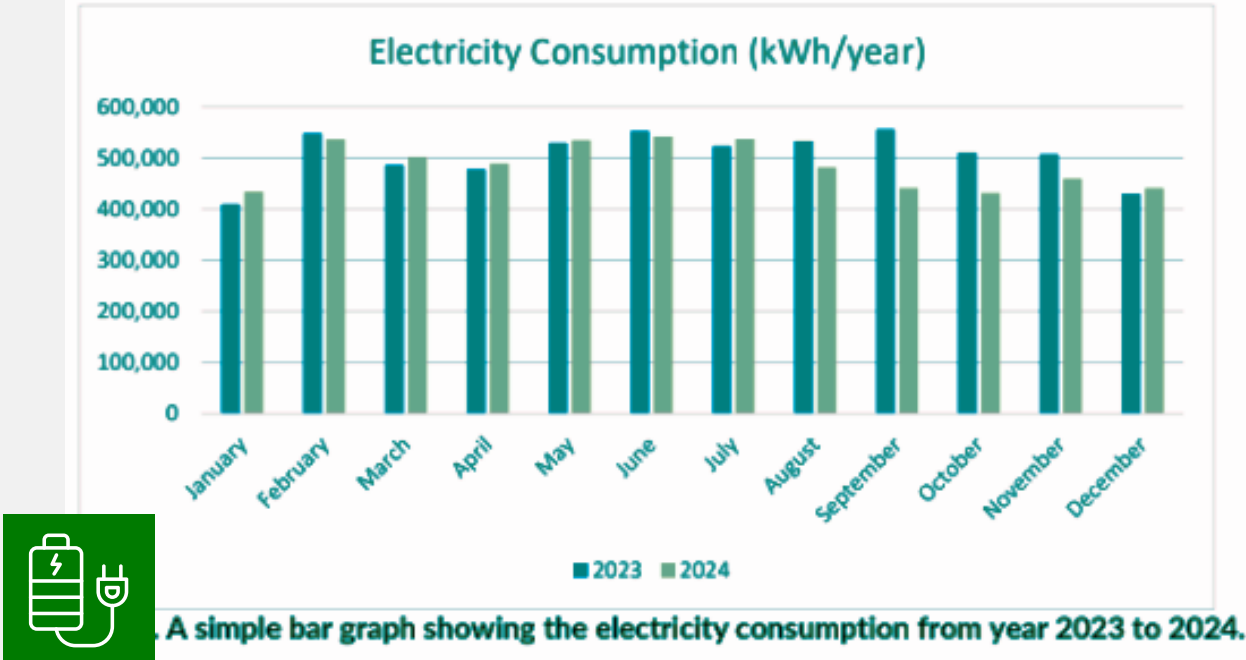


The Challenge

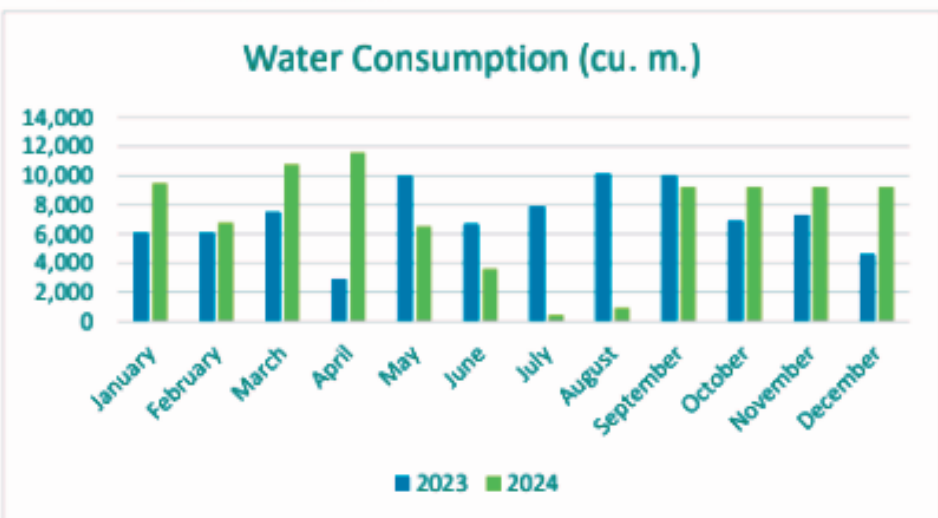


The objective was to conduct a **Level 2 Energy Audit** to evaluate existing building conditions, utility consumption patterns, and operational practices. The goal was to establish 2024 as a baseline year and identify a suite of Energy Conservation Measures (ECMs) that balanced initial investment with significant long-term financial and energy savings.

Electrical Consumption (kWh/year)		
Month	2023	2024
January	409,741	433,823
February	548,073	536,142
March	486,460	501,827
April	478,122	489,007
May	529,536	534,792
June	552,602	541,365
July	522,765	536,956
August	533,342	481,223
September	555,903	440,841
October	510,134	430,719
November	507,116	459,463
December	429,799	440,966
Total	6,063,593	5,827,124



Water Consumption (cu. m.)		
Month	2023	2024
January	6,064	9,466
February	6,064	6,771
March	7,497	10,764
April	2,924	11,578
May	9,958	6,514
June	6,667	3,590
July	7,866	436
August	10,131	927
September	9,993	9,212
October	6,921	9,212
November	7,307	9,212
December	4,615	9,212
Total	86,007	86,894



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With WESTCO's comprehensive audit services. From power quality to mechanical system efficiency, WESTCO- a **DOE certified Energy Service Company (ESCO)**- can help you uncover cost-saving opportunities while ensuring compliance with RA 11285 – the Energy Efficiency and Conservation Act.

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✓ The Solution

WESTCO deployed a systematic audit process focused on four key areas:

- ✓  **On-Site Technical Survey:** Conducted a deep-dive inspection of all office machinery, production equipment, and electrical infrastructure.
- ✓  **Data-Driven Baseline Analysis:** Evaluated historical utility data, noting a 2024 electricity consumption of 5,000,000 kWh and establishing an Energy Usage Intensity (EUI) of 1.73 kWh/kg.
- ✓  **ECM Identification:** Developed a tiered strategy (No-cost to High-cost) focusing on high-impact electrical components:
 - ✓  **Lighting & HVAC:** Proposed LED retrofitting and ACU Inverter upgrades.
 - ✓  **Motor & Power Quality:** Analyzed the benefits of VFD (Variable Frequency Drive) retrofits for air compressors and the installation of Static Var Generators (SVG) to optimize power quality at multiple points (M1 and M2).
 - ✓  **Financial Modeling:** Calculated the Simple Payback Period (SPP) for each measure to ensure fiscal responsibility.



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The Impact

The audit provided a clear financial and technical pathway to significantly reduce the facility's carbon footprint and operational expenditure.

-  **Substantial Energy Savings:** Projected annual reduction of 57,000.00 kWh.
-  **Financial Impact:** Expected annual cost savings of half a million pesos.
-  **Efficient Payback:** Despite a total implementation cost of 1.6 million pesos, the average payback period is only 2.91 years.
-  **Specific Wins:** The LED Retrofit offers a near-instant ROI with a payback of just 0.26 years.
-  SVG Installations account for the largest portion of savings, totaling over ₱363,000 in annual avoided costs.
-  **Strategic Direction:** The audit laid the groundwork for advanced controls (Lighting Control Systems) and a "Cultural Shift" toward energy awareness to sustain these technical gains.

No.	Project	Initial Cost (₱)	Energy Savings kWh	Cost per kWh (₱)	Total Cost Savings (₱)	Simple Payback (years)
1	LED Retrofit	₱ 6,150.00	2,394	₱ 10.00	₱ 23,940.00	0.26
2	ACU Inverter Upgrade	₱ 413,955.00	13,334	₱ 10.00	₱ 133,340.00	3.10
3	Air Compressor VFD Retrofit	₱ 132,549.41	5,049	₱ 10.00	₱ 50,490.00	2.62
4	Static Var Generator (SVG) Installation at M1	₱ 748,217.06	23,381.80	₱ 10.00	₱ 233,818.00	3.20
5	Static Var Generator (SVG) installation at M2	₱ 363,800.64	12,928.80	₱ 10.00	₱ 129,288.00	2.81
	Total	₱ 1,664,672.11	57,087.60	₱ 10.00	₱ 570,876.00	2.91

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Conclusion

The Level 2 Energy Audit serves as more than just a technical assessment; it is a strategic roadmap that transitions the facility from general energy initiatives to precision-driven efficiency. By establishing a rigorous 2024 baseline of 1.73 kWh/kg, the audit moved beyond guesswork to provide a granular view of where every kilowatt is spent. The results prove that industrial sustainability and fiscal responsibility are not mutually exclusive. With a projected annual savings of half a million pesos and a rapid average payback period of 2.91 years, the identified ECMs—ranging from immediate wins like LED retrofitting to high-impact SVG installations—offer a clear path to reduced operational overhead.

Ultimately, this audit empowers the facility to maintain its high-output production of 3.1 million kilograms while significantly shrinking its environmental footprint. By integrating these technical upgrades with a renewed "Cultural Shift" toward energy awareness, the company is now ready to meet the demands of a more sustainable global market.



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