ANNUAL STRATEGIC ENERGY MANAGEMENT REPORT

- Completion Report for Period Year *1* -

Presented to:

Acme Manufacturing
5411 NE Hwy 99 Vancouver
Hazel Dell, WA 98663

Sponsored by:

Clark Public Utilities

and

Energy Smart Industrial

4/1/2022

DISCLAIMER

The intent of this Strategic Energy Management (SEM) Completion Report is to provide a final analysis of the actual energy savings and implementation costs associated with the SEM reporting year. Appropriate detail is included in this report.

Acme Manufacturing shall independently evaluate the results of any recommendations provided in this report. In no event will Clark Public Utilities and or the Bonneville Power Administration and its third-party program partner Energy Smart Industrial be liable for the failure of the Acme Manufacturing to achieve a specified amount of energy savings, the operation of Acme Manufacturing's facilities, or any incidental or consequential damages of any kind in connection with this report or the implementation of recommended measures.

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1. Program Savings Results

This report outlines the documented energy savings associated with the first year of the Strategic Energy Management (SEM) engagement at Acme Manufacturing in Hazel Dell, WA. SEM was offered by Clark Public Utilities to their industrial sector customers via the Bonneville Power Administration's (BPA) Energy Smart Industrial (ESI) program.

Year 1: Acme Manufacturing exceeded their 5% energy savings target, achieving 5.2% SEM savings compared to the baseline period. In addition, the site completed an exterior LED lighting upgrade project, resulting in an impressive total savings for the site of 5.9%. Overall, the total annual SEM financial benefit for the site was $49,999.99.

This represents an increase of savings of 222,222 kWh above the savings in the previous program year. The individual savings and totals are presented in Table 1 below.

Table 1. Summary of Savings and Financial Benefit

Description	Year 1
Performance Period Start	1/1/2021
Performance Period End	12/31/2021
Gross Energy Savings	999,999 kWh
Net Energy Savings	888,888 kWh
Percent Energy Savings	5.20%
Incentive	$5,555.55
Avoided Energy Costs	$44,444.44
Total SEM Financial Benefit	$49,999.99

Details as to how these values have been calculated are provided in Section 3. An Excel based spreadsheet accompanies this PDF file with the calculated savings, adjustments, and capital savings detailed.

2. Energy Management Objectives, Challenges, and Achievements

2.1 Energy Management Objectives

The energy team at Acme Manufacturing set an annual energy savings goal of 5%.

The core energy team for Acme Manufacturing is shown in **Error! Reference source not found.**. The team held dedicated energy team meetings on a bi-weekly schedule.

Table 2. Energy Team

Name	Site Role	SEM Role
Eric Mullendore	Facility Manager	**Executive Sponsor**
Todd Amundson	Energy Management Engineer	**Energy Champion**
Nathan Kelly	Electrical Engineer	**Data Coordinator**
Kyle Barton	Program Lead	**Team Member**
Jennifer Wood	Program Specialist	**Team Member**

2.2 Energy Management Challenges

Completion of energy savings opportunities is a challenge with the presence of competing priorities. A specific hindrance to meeting opportunity completion due dates is a new Global Corporate Initiative, which has absorbed significant energy and resources.

2.3 Energy Management Achievements

The energy team is comprised of five members (Table 2), which meets two times per month. In addition to these meetings, the team is committed to a daily report out on energy metrics such as electrical consumption, fuel use, and other numbers.

Key accomplishments from this engagement year are summarized in Table 3.

Table 3. Energy Efficiency Measures Implemented This Year

Measure Description	Measure Type	Date Complete
LED Lighting	Maintenance	9/30/2021
Relocation of HVAC thermostat	Operations	2/5/2021
Mezzanine air receiver repairs	Maintenance	6/16/2021
Identify and fix compressed air leaks	Maintenance	Ongoing
Reduced compressed air pressure by 4 psig	Operations	3/2/2021

2.4 Performance Tracking System

As part of SEM, Acme Manufacturing uses a cloud-based Energy Management Information System (EMIS) called Energy SENSEI. Acme Manufacturing uses Energy SENSEI to record significant events at the facility, track progress on opportunities identified during the SEM engagement, monitor energy usage and savings, and store process and energy data. The Performance Tracking System (PTS) helps to identify relationships between completed opportunities, process changes, and energy

performance. Examples of performance charts from the EMIS are provided in Appendix #.

Acme Manufacturing may be eligible to receive co-funding of up to $15,000 for the initial installation and up to $10,000 per two-year performance period to maintain their PTS. This year's PTS expenses and co-funding is summarized in Table 4. Invoices for eligible expenses are provided in Appendix #.

Table 4. PTS Maintenance Co-funding Summary

Description	Vendor Name	Invoice #	Year 1 Costs
Added CT's to electrical supply of each air compressor. Data collected and fed to EMIS to track system performance.	Compressed Air R Us	1344	$3,333
Compressed air flow meter installations at key location. Data collected and fed to EMIS to track system performance.	Compressed Air R Us	1345	$1,666
		PTS EXPENSES	**$4,999**
		PTS MAINTENANCE BUDGET	**$10,000**
		TOTAL PTS MAINTENANCE CO-FUNDING	**$4,999**

3. CALCULATION OF SAVINGS AND INCENTIVES

The baseline energy model development, quantification of energy savings, and reporting of annual energy savings per this report and accompanying support documentation follows the guidance provided in the new BPA Commercial and Industrial Strategic Energy Management Measurement and Verification (C&I SEM M&V) Reference Guide.

3.1 ENERGY MODEL

One year of data provided adequate observations to evaluate any seasonality impacts of weather and production. The baseline period was from 11/1/2017 – 10/31/2018.

This statistical model provides weekly prediction of energy use as a function of the 3 independent variables listed below. Further details about the model are provided in the Energy Model Report, version 1.0 , dated 12/25/2018.

- Dry bulb outdoor temperature (average degrees per week)
- Holidays (# days per week)

- Production (pounds per week)
- Enter variable descriptor, e.g., D

3.2 Review of Data

Process and energy data were reviewed for outliers and errors. Energy and production data were reviewed and anomalies that were observed are described in section 3.4 of this report. Additional detail on the data and adjustments is included in the Performance Reporting Workbook, provided in Appendix #.

3.3 Incentivized Project Adjustments

Acme Manufacturing has completed 1 incentivized capital projects since the start of the engagement. The SEM incentive payment is based solely on the net SEM energy savings. Therefore, gross energy savings are adjusted by deducting savings from projects claimed separately. Energy savings have been adjusted to account for the following incentivized projects in Table 5. Additional details about these projects will be provided in the Performance Reporting Workbook, as referenced in section 3.2.

Table 5. Incentivized Projects

Project name	Install Date
LED Exterior Lighting Upgrade	1/12/2021
Project name or descriptor	Select install date
Project name or descriptor	Select install date
Project name or descriptor	Select install date
Project name or descriptor	Select install date

3.4 Non-Routine Events/Adjustments

Due to supply chain issues, Acme Manufacturing experienced significant drops in production from April 2021 – July 2021.

A non-routine adjustment was made as a result of production falling below the valid minimum of the baseline energy model for a period of 105 days, beginning on April 5th and continuing through July 18, 2021. An analysis of the energy residuals showed that energy savings changed significantly during this period. Following IPMVP Non-Routine Events & Adjustments Guide (NRE adjustment for significant trends in residuals) method #4, the residuals for the period were evaluated to determine the change just after the lower production event until production returned to normal levels.

For the pre-non-routine event analysis, the SEM period preceding the event, and the SEM period following it, was included.

The calculation of the average value for the non-routine adjustment during the 4/5-7/18/2021 time period was an average value of 23,980 kWh per week.

Based on these results, the decrease in the model residuals were subtracted from the adjusted baseline energy as a non-routine adjustment beginning April 5th through July 18st.

Table 6. Calculations for NRE/NRA

Item	Value	Units
Lower Production – NRE_A Method #4	23,980	kWh per week
Click or tap here to enter text.	Enter the value	kW, hours, days, etc.
Click or tap here to enter text.	Enter the value	kW, hours, days, etc.
Click or tap here to enter text.	Enter the value	kW, hours, days, etc.
Year # Adjustment Total:	359,700	kWh per year
Yearly kWh Equivalent:	359,700	**kWh**

4. CONTINUOUS IMPROVEMENT AND NEXT STEPS

Acme Manufacturing's energy team is very encouraged by their Year 3 projects completed, and is looking forward to SEM success ahead.

This SEM engagement includes two annual reporting periods, which allow Acme Manufacturing to pursue long-term opportunities further and develop their internal energy management practices. The Acme Manufacturing energy team has the following projects as top priorities for the coming year:

Operations & Maintenance Projects

- Continue systematic air leak detection and repairs
- Repair of warehouse air door heaters
- Optimize compressed air system controls

Capital Projects

- Install VFD's on Cooling Tower Fans
- Phase 2 – Upgrade Outside Lighting to LED
- Capital Project 3 Name

Acme Manufacturing agrees to submit data at least annually for the annual Completion Report. They are encouraged to provide monthly production data and action item progress updates. Upon submittal of the required data, Program tech support will draft the Completion Report which will document the verified annual savings. After stakeholder parties have approved the report, they will process an incentive payment in the amount of $0.025/kWh multiplied by the verified savings or as per the agreements signed by Acme Manufacturing and Clark Public Utilities subject to the $25,000 incentive cap.

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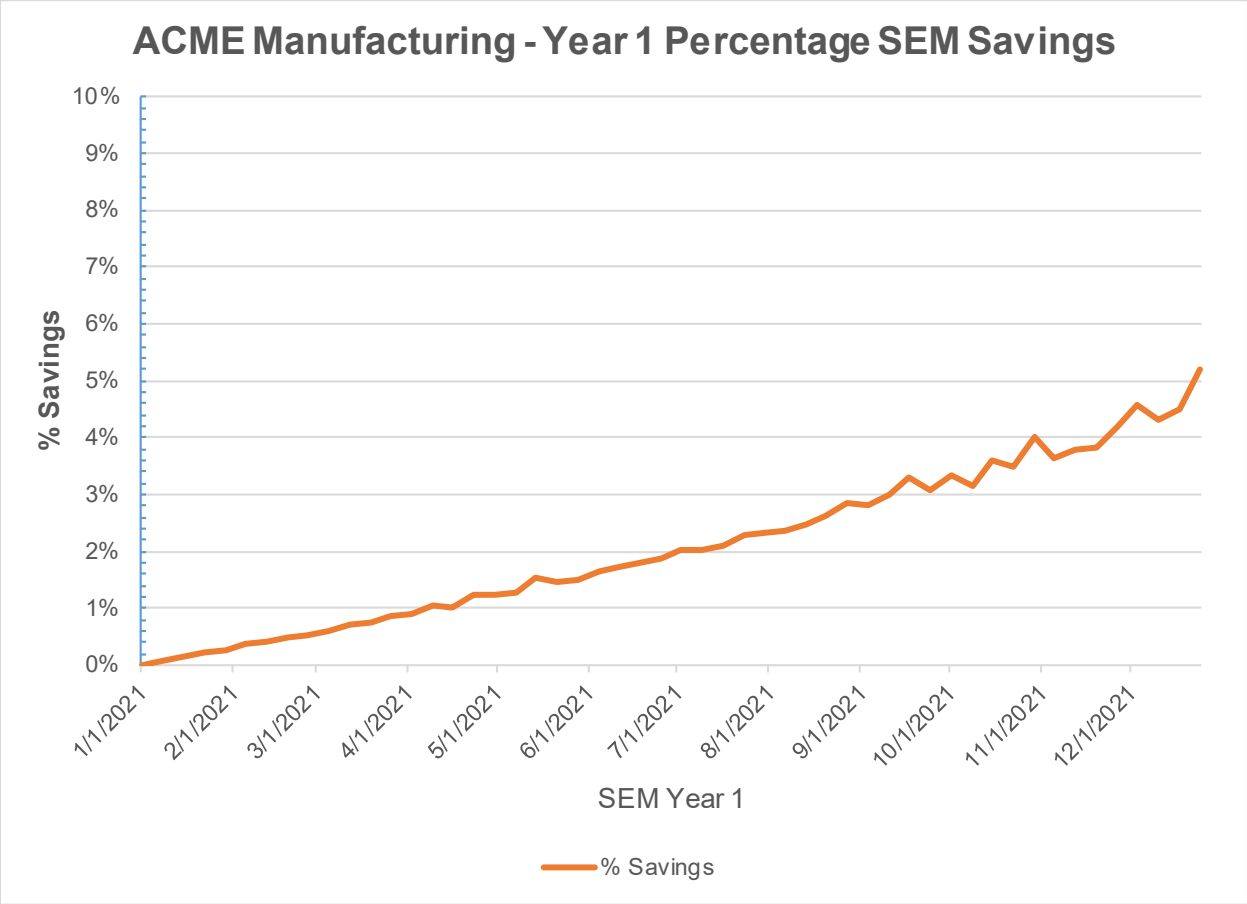
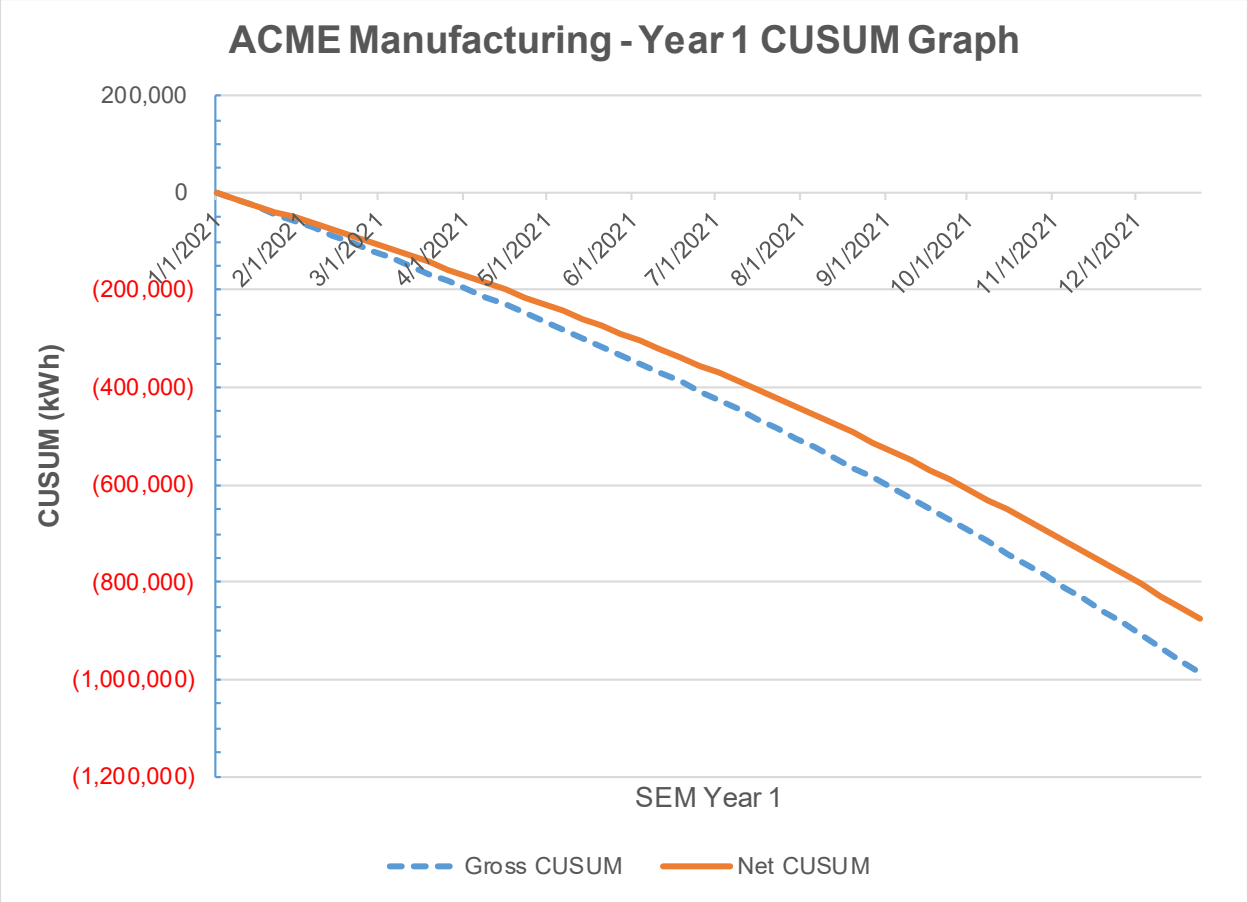
A. PERFORMANCE GRAPHS

Graph 1. Percent of Savings per Week



Graph 2. Energy (kWh) Savings per Week



B. GLOSSARY OF TERMS

Energy model. A calculation tool that permits predicting the energy consumed at a facility based upon factors such as weather, production volume, or operational status. Used to calculate expected energy consumption over a period of time to determine energy savings.

Gross energy savings. Total energy savings, including all SEM savings as well as incentivized project savings.

Incentivized project. An energy efficiency project claimed separately from SEM that is incentivized by the sponsoring utility. Measurement and verification of these projects is independent of the SEM engagement and energy model.

Net energy savings. Savings attributed to the completion of SEM projects. Net savings are equal to the gross energy savings minus incentivized project savings.

Non-routine adjustment. Individually engineered calculations used to adjust the predicted energy use for unexpected events that cause changes in energy use that are not due to variations in the modeled independent variables.

Residual. Actual energy use minus the model-predicted energy use for a single interval (e.g., one day) of the energy model.

Strategic Energy Management (SEM). The application of continuous improvement business principles to drive systematic, long-term reductions in the energy intensity of a system, facility, or organization.

C. Performance Tracking System Invoices

D. APPENDICES

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