



AMERICAN
AXLE &
MANUFACTURING

WORLD HEADQUARTERS

December 4, 2008

Alyssa Quarforth
US EPA
Ariel Rios Building
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Mail Code: 6202J
Washington, DC – 20460

Dear Ms. Quarforth,

Please find attached the required documentation for the 2009 ENERGY STAR Awards application. Should you have any questions, please do not hesitate to contact me at the number shown below or via e-mail. Looking forward to hear from you.

Sincerely,

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***AMERICAN
AXLE &
MANUFACTURING***

2009

PARTNER OF THE YEAR
ENERGY MANAGEMENT
AWARD APPLICATION



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Attachments

- Attachment 1 AAM Energy Policy
- Attachment 2 ENERGY STAR Partnership Letter
- Attachment 3 Scorecard Report for September & 3rd QTR 2008
- Attachment 4 2008 July 4th Shutdown Report
- Attachment 5 Christmas Curtailment Memo
- Attachment 6 AAM Energy Management Handbook
- Attachment 7 AAM Energy Newsletter

Executive Summary

Due to the rising energy cost and environmental depletion, American Axle and Manufacturing (AAM) has committed to proactively reduce its energy usage. Thus, the present report introduces the Energy Management Program implemented at AAM, and how it has led to great success among all worldwide production and non-production facilities. The company's commitment to energy reduction started in its World Headquarter, and comes from the highest management level in the organization. The publication of an Energy Policy, in addition to the designation of an Energy Director, a Corporate Energy Team, and Energy Champions in each facility is proof of the serious and uniform commitment in the organization. These became the key components, along with the Energy Management Handbook, to the effective implementation of the Energy Management Program.

As described later, the Corporate Energy Team uses metrics to track energy performance and progress. In 2008, from January to September, AAM has reduced its energy usage by **4.5%**; which translate to about **\$2.5M** in savings and **18,995** tons of CO2 emission reduction. Between Sep-06 to Sep-07 and Sep-07 to Sep-08, AAM reduced its energy intensity from 516 MBtu/ft² to 437 MBtu/ft².

In addition to the internal effort, AAM is looking for external assistance via the Department of Energy and the ENERGY STAR Buildings & Plants Program. In March 2008, the company became an ENERGY STAR Partner, and one of the main goals is to obtain the ENERGY STAR label for the World Headquarter Building. Additionally, despite of being a young member, AAM is looking for external recognition for its success in the energy conservation field, so it is attempting to achieve the 2009 ENERGY SATR Partner of the Year Award. This emphasizes even more the serious commitment to energy reduction in order to improve the financial performance of the company and the environment.

Introduction

In today's economy, a proactive approach is a must to overcome all the financial challenges impacting most of the companies' profitability worldwide. Therefore, as part of its management for profit strategy, American Axle and Manufacturing (AAM) has adopted a proactive approach regarding cost reduction and process efficiency improvements. Nowadays, it is well acknowledged that energy cost is becoming a bigger issue for a lot of companies. So for these reasons, and per higher worldwide energy demand significantly boosting a faster environmental depletion, AAM hereby intends to demonstrate its commitment to energy reduction. The present report describes AAM's energy efficiency practices and how these have rendered great results to the company's financial performance.

AAM Energy Management Program

AAM has established different management practices to guarantee that the company will produce the most with the least amount of waste possible. In order to effectively implement these practices, an Energy Management Program was created with the main objective of minimizing energy use, cost, and CO2 emission. The program was introduced to all AAM facilities on April 25th 2007 through an energy champion meeting. Since then, all production and non-production facilities have been implementing it with positive results. According to the ENERGY STAR Guideline for Energy Management, there are seven steps that are proven to effectively improve an organization's energy and financial performance. It is advised that these guidelines are followed to guarantee the effective implementation of any energy management program. Thus, AAM's Energy Management Program is described below as it relates to the ENERGY STAR Energy management guidelines.

Commitment to Energy Efficiency

Usually, some of the goals set at any company are not reached due to the lack of serious commitment at every level of the organization. To assure the success of AAM Energy Management Program and spread the company's commitment toward reduced energy use, an **Energy Director** has been designated. The Energy Director leads the **AAM Corporate Energy Team** through significant accomplishments to communicate the company's perspective of energy reduction. One of these accomplishments is the implementation of the **AAM Energy Policy** which clearly establishes AAM's commitment to reduce energy and minimize environmental depletion as it incorporates energy efficiency into the company's culture (see attachment #1). To improve the communication between corporate and plant floor, energy champions were appointed in every plant. The Corporate Energy Team works together with the Energy Champions to coordinate and execute energy management activities and to ensure implementation of practices with the highest standards.

Another sign of the corporate commitment is AAM joining the ENERGY STAR Building Partnership (see attachment #2) with the main goal of becoming a leader among energy efficient buildings in the region. The Corporate Energy Team is working to reach the 75% score required through portfolio manager to get the ENERGY STAR Label for the World Headquarters Building (WHQ). At this moment, the WHQ has a score of 62% but this is 11 units higher than its score since the company joined the partnership.

The setting of a corporate energy reduction goal for 2008 is also proof of the serious commitment. The Energy Director works with the Corporate Energy Team to establish the plants' energy baseline and goals. Based on 2007 corporate performance, a **5% energy reduction goal** has been established. Having set the goal, the corporate energy team works on measuring the progress and benchmarking the plants with one another as it is described below.

Measuring Performance and Benchmarking

As mentioned previously, the Energy Director, the Corporate Energy Team, and the Energy Champions work together to measure the plants' progress or set backs in respect with the goal. The following procedure describes the basics for evaluating the facilities' energy performance:

Invoice Tracking: Every month all the utility invoices are collected to record the energy and water usage with correlating cost per facility. Other factors, such as low power factor and peak electric demand, are also recorded. The data is entered into a spreadsheet per facility which feeds the utility tracking tables and charts used for the comparison of the current year's performance with the previous one.

Remote Monitoring: Using Powerlogic, a remote monitoring system, and the utility company web system to collect usage data (where available), daily electricity, natural gas, and steam usage is recorded to evaluate the facilities' performance during production and non-production days. This data is used to compare trends between the current month been studied with previous ones. Figure #1 presents this type of analysis. It shows the daily steam usage and average outdoor air temperature for the Detroit complex during October 2007 and 2008. The trend was used to determine if the plant has been curtailing steam in respect with temperature and production. The same type of trends were analyzed for the summer months to evaluate the curtailment of steam during non-production hours.

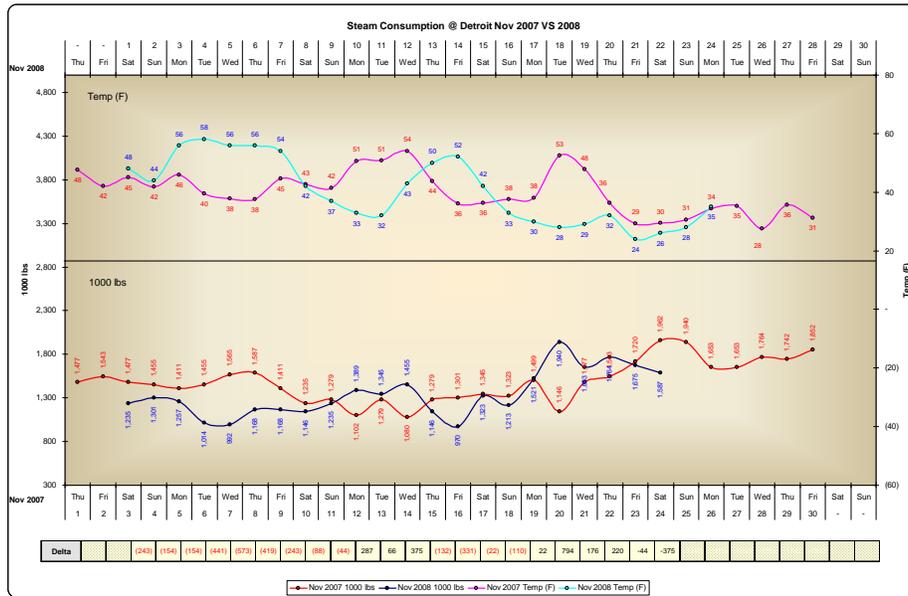


Figure 1 – Daily steam usage and average outdoor air temperature in Oct 2007 & 2008 at the Detroit Complex

Normalizing Data: The Corporate Energy Team has developed a statistical model per facility to project energy usage with changing production and weather conditions. To create the model, actual production and weather data is analyzed with statistical software. Statistical figures such as the Coefficient of Multiple Determination, R2 value, and the Coefficient of Variation of the Root Mean Square Error (CV-RMSE) are used to evaluate the accuracy of the models. The models are used to project energy usage given actual sales and outdoor air temp. Projected and actual energy usage is compared to evaluate the plants' energy performance.

Energy Savings: Energy savings are estimated by calculating the difference between the actual and projected energy usage per plant. Energy cost savings are estimated by multiplying the energy reduction by the monthly average unit cost per energy source. The % of energy reduction is used to evaluate the plants' energy performance, and it determines the score for the monthly energy scorecard which is described below.

Scorecard Report: A scorecard report is issued each month and quarter, presenting the energy performance of all evaluated facilities. It communicates to all organizational levels which facilities are the best performers are and where to steer future efforts to prevent missed opportunities from occurring in the future. Attachment #3 presents the scorecard table for September and third quarter 2008. The table shows the actual energy usage per source, the percentage reduction per source, and total percentage reduction in MMBtu. It also shows the MBtu / \$ Sales, which is the figure used to track the energy intensity of the plants

in respect to the number of shipments per month. The last column of the table presents the plant's score. There are four combinations of colors that portray the plants' performance. Green is granted when the plant reaches or exceeds the energy reduction goal (5%). Yellow-Green is given when the plant managed to reduce its energy usage, but the goal is not reached. Yellow represent those plants that neither reduced nor increased its energy usage, and red-yellow is given when the plant increased its energy consumption, but improved significantly in a particular area. Red denotes failure to reach the energy goal without any improvements.

Other factors in addition to the percentage reduction are also considered to determine the score when necessary. For instance, in the case of small facilities such as those in China and Poland, the financial impact that their increase or reduction has over the total consumption is also taken into account to determine their scores.

CO2 Emission Reduction: An on-line CO2 emission calculator which takes into account the source of energy (Electricity or Natural Gas) and the geographical location of the plants, is used to estimate the reduction of CO2 emission. Some plants, such as Mexico, Albion, etc., provide the conversion factor supplied by the local utility company.

Goals

As mentioned earlier in this report, the setting of 5% energy reduction goal for 2008 communicates serious commitment toward energy efficiency. Also, the goal is intended to ensure progress. Each facility's ability to reach or exceed the goal every month will determine their scorecard rating unless specified otherwise.

Also, it has been established that all production facilities shall not use more than 25% of their regular-production energy load during shutdowns. Therefore, the corporate energy team uses daily trends to evaluate the performance of all the facilities during long weekends and maintenance shutdowns. The results are presented to all the organizational levels through the shutdowns reports and energy memos (see attachment #4 & #5)

Energy Management Handbook

Having an action plan ready to implement corrective measures and actions when necessary is very important for a successful Energy Management Program; hence the development of the **AAM Energy Management Handbook** intends to assist in guiding the effective execution of the Energy Management Program (see attachment #6). The handbook describes the guideline for effectively setting goals and baselines, tracking energy use, normalizing data, benchmarking, and evaluating the energy performance of all facilities implementing the program. In addition, it establishes the roles and objectives of

the Corporate Energy Team and their interaction with the Energy Champion assigned to each facility. Useful tools and recommendations are also described to improve the effectiveness of energy audits as well as the energy performance during production and non-production days such as curtailment plans for shutdowns.

Implementation

As mentioned above, the Corporate Energy Team and the Energy Champion, along with plant personnel, follow the energy handbook guidelines to coordinate and implement the corrective actions needed to prevent missed opportunities from occurring in the future. Usually these actions are determined during internal or external energy audits, and the results are presented later to the facilities' manager and upper corporate management via a final report and the energy scorecard. For instance, some issues have been found through the scorecard analysis in some facilities. Therefore, as specified by the Energy Handbook, an energy audit is recommended to identify the cause of the problems and determine the possible correction plan. AAM has applied for several Energy Saving Assessments with the Department of Energy (DOE) to address these issues. So far, four assessments have been performed; one pump assessment in Tonawanda, one heat treat and one steam assessment in Detroit, and one heat treat assessment in Minerva. Currently, the corporate energy team is working to implement some of the most promising correction plans found during these assessments. For example, high steam usage in Detroit has been an issue for the past few months. During the assessment, it was found that most of the steam volume used in the plant is for space heating, so it could be shutdown almost entirely during the summer. In addition, the corporate energy team is evaluating the possibility of converting the little steam-powered equipment taking steam for production to natural gas.

Self-Evaluation

The Corporate Energy Team uses the data collected via the utility tracking analysis to evaluate the effectiveness of the corrective actions implemented. In the case of setbacks, a study is initiated to spot anomalies during the implementation of the energy management program associated with the setback. Once these are identified, new corrective actions are established to prevent them from occurring in the future. During this process, it is also necessary to perform internal or external energy audits in order to dig deeper in search of the problem causing the setback. In the case of positive results, as it is described below, the corporate energy team recognizes the achievement and immediately communicates about it to all organizational levels.

Credit to Best Performers

The Energy Scorecard Report and the Energy Newsletter (see attachment #7) are common tools used to provide recognition to the best performers. When possible, it is advised to follow the best performer's practices in other facilities to spread the success of proven-effective energy efficiency practices. In addition, the Corporate Energy Team is also in search of external recognition. For this reason, as mentioned earlier in this report, AAM joined the ENERGY STAR Building Partnership, and hereby applies for the 2008 ENERGY STAR Partner of the Year Award.

Achievements

The implementation of the Energy Management Program and the Energy Scorecard has led to great success regarding energy curtailment. In 2008, from January to September, AAM has come within striking distance of the energy reduction goal with **4.5%** among its production facilities. These efforts translate to about **\$2,474,783** in energy savings and **18,995** tons of CO₂ emission cutbacks. Table #1 and Figure #2 below put these figures in perspective.

Product	Electrical Energy per Hour (Kw) *	Quantity
AAM Saved from Jan to Sep 2008	3,702	1
TV	0.160	23,136
Electric Shaver	0.015	246,786
DVD Player	0.035	105,766
Laptop	0.075	49,357
Average Household	1.140	3,247

* Total savings was divided by the # of hours from Jan to Sep 2008 (approximately 6480 hours)

Table 1 – Energy savings equivalent to the number of TVs, electric shavers, DVD players, laptops, and AVG household powered



Figure 2 – CO₂ emission savings equivalent to number of soft wood trees planted

Table #2 represents the 2008 scorecard for January through September. The total energy and CO₂ emission reduction for this period was calculated based on

the exclusion of some facilities during the time when they were significantly impacted by a work stoppage earlier in 2008.

January - September 2008 Score Card

Site	Energy Consumption			Energy Usage in MMBtu			Energy Scorecard 2008			Estimated Tons of CO2 Reduction		
	Actual			Adjusted Usage	Actual Usage	% Reduction	MBTU/\$ sales		Rating	Tons of CO2 Reduced for Elect	Tons of CO2 Reduced for NG	Total Tons of CO2 Reduction
	Elect (kWh)	NG (MCF)	Steam (1000 lbs)				2008	2007				
DGA	75,603,893	96,330	115,037	455,124	469,328	3.1%	1.04	0.77	●	(288)	12	(275)
DF	14,302,516	50,503	75,705	177,123	175,008	-1.2%	4.19	3.59	●	779	164	943
MSP	20,777,184	3,015		84,589	73,907	-12.6%	1.22	1.41	●	2,297	46	2,342
Oxford Forge	2,679,509	7,149			16,292				●			
3R	26,578,649	104,195		214,151	194,881	-9.0%	1.11	0.92	●	2,412	531	2,943
TF	28,922,401	65,457		183,292	164,140	-10.4%	2.47	2.72	●	1,101	716	1,816
CKT	5,610,277	11,978		33,317	31,120	-6.6%	3.90	3.16	●	303	12	316
Malvern	11,991,696	25,803		76,238	66,719	-12.5%	1.66	1.33	●	2,750	(54)	2,696
Minerva	13,284,000	20,888		70,258	66,213	-5.8%	1.40	1.27	●	1,260	(44)	1,216
Salem	5,273,182	20,562		42,344	38,554	-9.0%	2.32	2.47	●	271	166	436
Brazil	8,718,567	6,566		38,731	36,314	-6.2%	0.61	0.70	●	424	25	448
GF	15,579,564	20,710		389,323	359,516	-7.7%	0.49	0.60	●	4,964	123	5,087
GGA	46,473,700	127,080										
China	1,465,920	5,459		10,894	10,461	-4.0%	2.52	1.59	●		14	14
Albion	11,737,241	57,240		108,762	97,288	-10.5%	1.37	1.51	●	564	449	1,014
Poland	203,444			690	694	0.6%	1.28	2.10	●	(1)		(1)
Corp	289,201,745	622,935	190,742	1,884,836	1,800,434	-4.5%	1.01	1.03	●	16,835	2,160	18,995

Table 2- 2008 Scorecard table for production facilities from January through September

Table #3 presents a comparison of AAM energy usage between Sep-06 to Sep-07 and Sep-07 to Sep-08 for each its driveline and metal forming divisions, as well as its non-production facilities.



Energy Reduction		#	Total Floor Area (ft ²)	Energy Usage (MMBtu)	Energy Intensity (MBtu/ft ²)
Sep-06 to Sep-07	Drive Line Division	8	5,037,000	2,101,436	417
	Forging Division	8	1,663,262	1,502,508	903
	Non-Production Facilities	4	399,873	59,311	148
	Corporate	20	7,100,135	3,663,255	516
Sep-07 to Sep-08	Drive Line Division	8	5,037,000	1,866,366	371
	Forging Division	8	1,663,262	1,177,940	708
	Non-Production Facilities	4	399,873	61,318	153
	Corporate	20	7,100,135	3,105,624	437
Change	Drive Line Division			-47	
	Forging Division			-195	
	Non-Production Facilities			5	
	Corporate			-79	

Table 3 - Change in energy intensity corporate-wide between Sep-06 to Sep-07 and Sep-07 to Sep-08

The table above shows how AAM reduced its energy usage corporate-wide despite an increase among its non-production facilities. The energy usage and intensity were reduced by **15%**. This figure is higher than what was reported previously by the Corporate Energy Team since the scorecard for 2008 from January through September is based on normalized data to account for differences in production and weather conditions between the two periods of concern.

The list below describes some of the most significant projects that boosted AAM's commitment to energy awareness and led to the effective implementation of Energy Management Program.

- Development and Implementation of the Energy Management Program.
- Implementation of the AAM Energy Policy.
- Development and Implementation of the Energy Management Handbook.
- Development and Implementation of the Energy Scorecard.
- Implementation of the AAM Energy Newsletter.
- Internal and external energy audits and assessments.

The use of these tools in coordination with personnel at each facility triggered the success of AAM regarding energy reduction and the prevention of environmental depletion. Following the continuous improvement practices, AAM will revise its procedure periodically to identify missing opportunities to ensure future progress.



Spreading the Energy Efficiency Word

The Energy Director, The Corporate Energy Team, and the Energy Champions work constantly to create and maintain communication channels to keep all the AAM associates posted about the company's success, and to raise awareness of energy reduction and its positive impact on society and the environment. Yet, the corporate energy team is currently preparing to give presentations to outsiders about the importance of reducing energy usage and its positive impact over everyone's economy. These presentations are intended to raise awareness to energy reduction outside of AAM. They will be focused on the company's success on the energy efficiency field and how the ENERGY STAR organization has boosted it through its guidelines and tools.