SEM at Scale: OMG, My Cohort Has 142 Facilities!

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ABSTRACT

This paper is republished from the 2020 ACEEE Summer Study to accompany a presentation on this topic at the 2021 conference.

This paper presents a case study of how Sysco - a global foodservice leader - has invested in a 14+ year journey to scale strategic energy management (SEM) using technology to enhance accountability. This program has achieved $317 million in avoided electricity cost over a 14-year period through a combination of operations and maintenance activities, behavioral change, retrofits, and efficient design. Sysco has achieved incremental savings each year despite changes in people and focus.

This SEM program must meet the following challenges:
- Manage timely reporting using 142 site-specific energy baseline models.
- Track 6,000 energy projects.
- Collect 17,500,000 rows of data each year from 5,000 data streams, including utility bills, interval meters, weather, and production.

This paper investigates how Sysco has leveraged data and organizational practices to create the consistency, credibility, and accountability necessary to scale its successful program. We answer the following questions:

- How has the program distilled energy data into meaningful conclusions to drive action?
- How does the program create a culture of energy accountability?
- What technologies have worked? Which have not?
- What lessons are applicable for DSM programs looking to scale SEM?

Introduction

Strategic energy management (SEM) has a scaling problem. As SEM evolves towards an emphasis on continuous engagements, demand-side management (DSM) programs will transition from managing dozens of SEM customers to hundreds. Our observations and experiences from working with SEM programs around the country since 2010 suggest that the traditional labor-intensive methods of delivering SEM—such as Excel-based tracking workbooks and decentralized energy data collection—cannot scale reliably and cost-effectively at these levels of participation. To successfully administer SEM across hundreds of sites, programs must leverage energy performance tracking technologies to standardize and streamline their programs, ensure accountability and savings persistence, and free up people to focus on the goal: taking action to save energy and establishing practices that ensure savings persistence.

Energy performance tracking technologies remove a critical barrier to scaling SEM programs. From our experience, the benefits extend beyond cost-effective scaling. With proper implementation, energy performance tracking drives accountability and culture change that leads to larger and more persistent energy savings. Effective use of energy performance tracking doesn't just keep score of SEM programs, it put more points on the scoreboard.

In this paper we present a case study of how Sysco—the global foodservice leader—has built an effective energy management (EM) program centered on using technology-enabled data analytics. Sysco has effectively employed tracking and reporting technologies to accurately and reliably measure energy performance across 142 distribution centers each and every day. More importantly, Sysco leverages energy performance tracking and reporting as the foundation to create the leadership-driven accountability and promote the culture changing habits required for their successful, lasting energy management program. By systematically tracking and reporting energy performance, Sysco enables its energy champions—those individuals in charge of translating the EM program into energy-saving actions—to take action and to ensure those actions persist. The lessons learned from this 14-year journey can be applied to DSM programs looking to expand SEM to more customers and deliver more savings.

The Sysco Energy Management Program

Sysco partnered with Cascade Energy to launch a comprehensive EM program in 2005 with the goal of saving 10% of electricity use within one year and 25% within three years. The program exceeded those targets and never looked back. Through its 2019 fiscal year, Sysco has avoided $317 million in electricity costs since program inception (Sysco 2019). Its program has been expanded multiple times to the current size of 142 broadline and specialty distribution centers in North America, and Sysco continues to push for annual incremental efficiency improvements across the program. The EM program is an important piece of Sysco's multi-faceted Corporate Social Responsibility (CSR) program, and Sysco's sustainability managers rely on energy efficiency as one of many solutions to achieve their 2025 CSR goals.

Roughly 50% of electricity use across Sysco sites is consumed by refrigeration equipment, and the remaining half is a mixture of lighting, office HVAC, battery chargers, and miscellaneous equipment. Energy savings have included the following types of projects:

- Facility retro-commissionings
- Training and behavioral change
- Mechanical and lighting retrofits
- Efficient new building design and construction

To obtain energy data necessary for performance tracking, the EM program relies on real-time energy monitoring via data acquisition hardware owned by Sysco and installed on each utility electric meter. The program also collects and stores all electric bills, receives hourly weather data from a subscription-based weather service, and tracks inbound and outbound daily case movement by facility.

Sysco's energy performance tracking methodology aligns well with many DSM-sponsored SEM savings verification best practices. Sysco maintains site-specific linear regression models with a fixed baseline period using daily data for each participating facility. Typical energy driver terms include dry bulb or wet bulb weather, product case movements,

and/or day-of-week indicators. For most facilities, the active baseline period is a 365-day window from 2014 through 2015. Some facilities have been re-baselined when better data became available, or after major facility changes. The program accounts for major operational changes and non-routine events using time-based model adjustment terms with coefficients derived from engineering analysis and/or submetering.

This model-based methodology powers the performance reporting that Sysco uses on a regular basis in ways discussed in depth throughout this paper. Additionally, Sysco tracks the long-term year over-year performance on an incremental kWh per 1000 ft^3 basis, with no normalization based on weather or case movement. An example of Sysco's energy intensity tracking can be found in Figure 1 below. This long-term reporting is a powerful accompaniment to the regression model-based reporting because of its clarity and consistency.
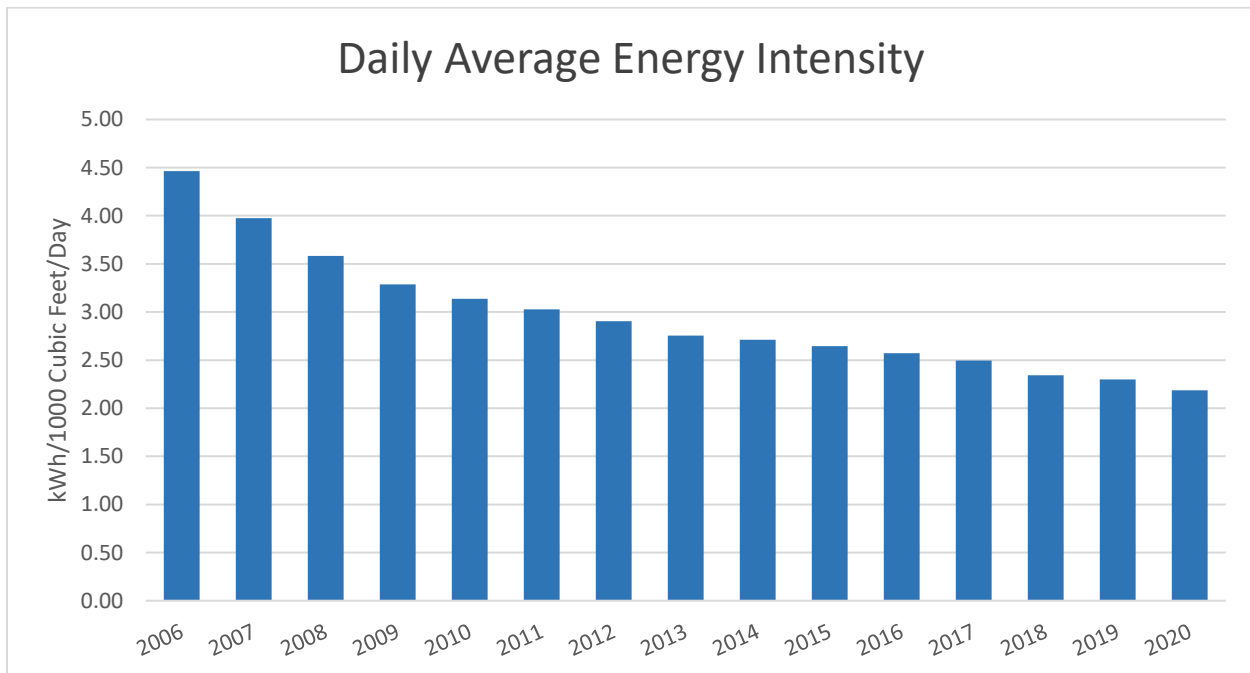

Figure 1: Daily average energy intensity for facilities in program. The Sysco Energy Management Program has seen an improvement on a kWh/1000 cubic feet basis for 15 consecutive years. Source: Cascade 2020a

Until 2012, savings reporting was performed using Microsoft Excel workbooks. Managing the program felt like re-painting the Golden Gate Bridge: as soon as a monthly report was complete, it was time to start on the next month's report—a feeling SEM program administrators and implementers can surely relate to. Time that could be spent driving change and implementing projects was instead spent doing energy accounting. The magnitude of data and reporting requirements strained the limits of Excel. To improve reliability and control costs, Cascade Energy proposed a switch to using a combination of two software platforms as the system of record for savings reporting: an energy management software platform developed in-house by Cascade Energy and a commonly available data visualization software package.

Energy Tracking Creates Leadership Accountability

Sysco uses energy tracking to create an accountability structure for energy performance. We call this concept *energy accountability*. Sysco's energy accountability starts at the C-suite, where the executive vice president communicates goals and tracks progress. Accountability feeds down through the Senior Director of Fleet and Facilities Maintenance, Director of Corporate Energy and Refrigeration, and regional maintenance directors, to facility maintenance managers and their staff. See Figure 2 below:
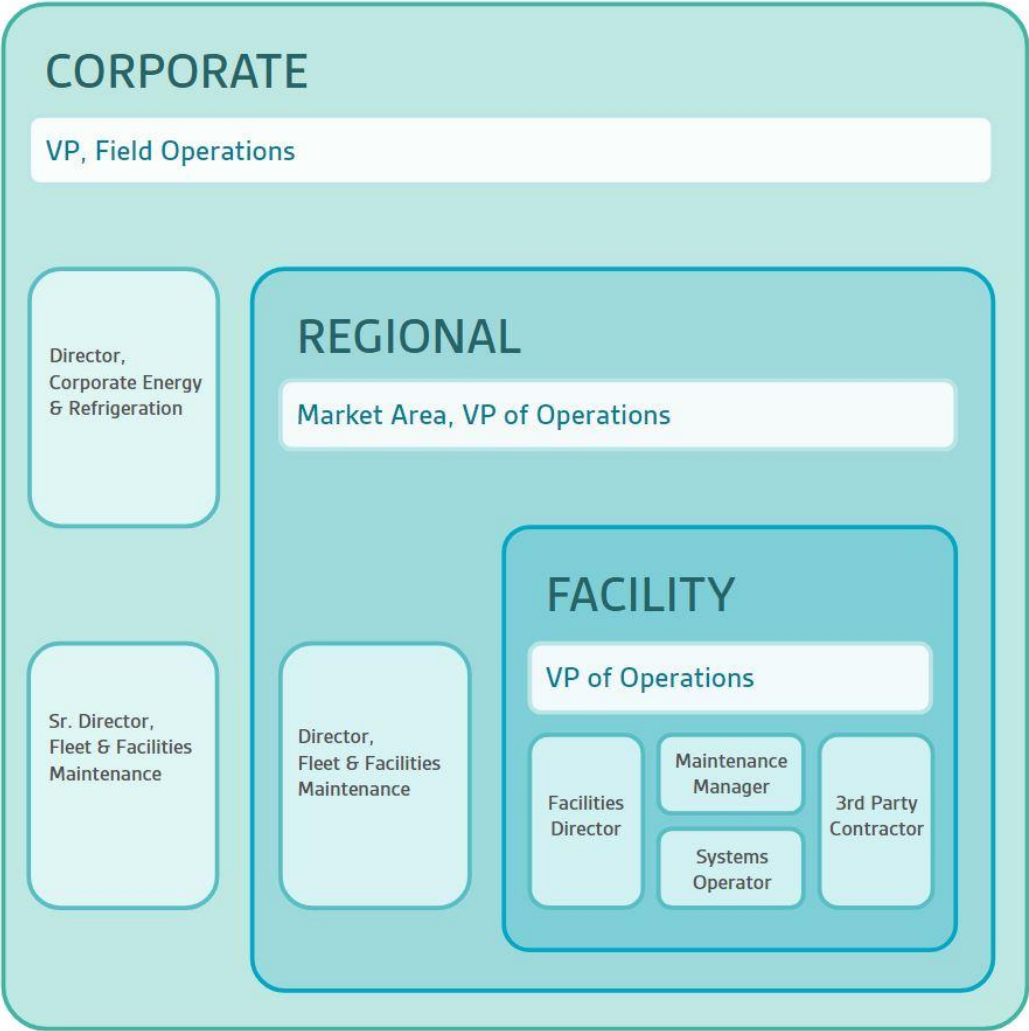

Figure 2: Energy Accountability at Sysco.

Energy Accountability Characteristics

Through years of testing, Sysco has identified the following energy performance tracking characteristics as requirements to create lasting and effective energy accountability. When issues have arisen that threaten Sysco's structure of energy accountability, the cause was invariably a breach of one of these characteristics.

Be consistent. Energy efficiency cannot be a flavor-of-the-month initiative. The expectation that the EM program is a long-term commitment encourages participants to focus on continuous improvement. Programs must provide consistent reporting on a consistent schedule to drive home the message that energy management is an important corporate objective.

Be clear. It is impossible to create energy accountability without absolute clarity around objectives and goals. Define what success looks like, and do not move the goalposts. Be deliberate about how success is defined; a cost or percent improvement is far easier to conceptualize than a kWh improvement. When program participants do not understand their energy performance numbers, their focus stays on the numbers rather than on finding ways to save energy.

Be fair. Energy performance tracking can be a strong motivator, as long as goals are challenging yet realistic. If an energy goal feels out of reach, the conversation can quickly turn to excuses and despair. Factors impacting energy use like the condition of the facility, productivity, and weather must be accounted for to fend off handwringing and excuses. The largest successful pivot to increase energy accountability fairness was to move away from ranking sites and to focus on site-specific incremental improvement. Through trial and error, Sysco has identified the metrics in Table 1 as fair vs unfair.

Table 1: Fair and Unfair Metrics

Fair Metrics	Unfair Metrics
Site-specific energy models	Normalized comparisons against other facilities
Site-specific goals based on potential	KPIs that do not account for throughput volume
Seasonal adjustments to goals	Same goal every month

Be timely. New news is more powerful than old news: reporting on energy performance from three months ago is already stale. Slow or tardy reporting delegitimizes the EM program and leads to excuses for slow and tardy responses.

Be trusted. Consistency, clarity, and timeliness all build trust, and accountability is impossible without trust. Trust is more important than precision, but mistakes erode trust. When trust in energy performance tracking is lost, the performance tracking no longer drives energy accountability.

Applicability to SEM

Although Sysco's EM program has underlying differences in structure and purpose, some program characteristics and lessons learned can be applied to DSM SEM programs.

SEM programs tend to channel their focus through the participant energy champion. The energy champion is responsible for leading energy team meetings, collaborating with energy coaches, attending workshops, and documenting energy projects. Cohort-based SEM provides an additional, proven mechanism to hold energy champions accountable by comparing their progress and results to peer participants.

Peer pressure in SEM can hold energy champions accountable, but energy champions often lack the bandwidth, knowledge, and/or toolkit to extend that accountability further into their own organization. Sysco's EM program provides participants with the framework to extend that accountability beyond the facility energy champion. Accountability is extended upwards by using performance tracking technology to put actionable, timely energy performance reporting into the hands of executive sponsors. Accountability is extended downwards by putting daily and weekly performance reporting into the inboxes of maintenance personnel and making energy performance a key performance indicator (KPI) for the maintenance team.

We have observed that most SEM energy performance reporting fails to create energy accountability within a participant organization because the reporting lacks one or more of the characteristics listed in the previous section. Specifically:

- **Lack of consistency**. SEM reporting is difficult to make consistent. The complexities around acquiring and managing energy and energy driver data make it difficult to achieve monthly reporting deadlines.
- **Lack of clarity.** The primary audience for SEM reporting is sometimes the DSM program, which uses units, terminology, and jargon that are not always clear or relevant to participants.
- **Lack of timeliness**. SEM reporting is frequently delayed due to missing data or administrative steps.
- **Lack of trust**. Shorter-duration SEM programs (lasting one year or less) have a shorter window in which to build trust in the reporting compared to longer-term programs.

We believe the SEM market has an opportunity to adopt the style of energy performance reporting exemplified by Sysco, specifically at participating sites without full-time energy managers. In Cascade Energy's experience, most energy champions are not looking for instructions on how to assemble an energy performance tracking toolkit; they want to grab a pre-built kit off the shelf. Across all the SEM programs Cascade Energy delivers, perhaps the most frequent piece of energy champion feedback is, "I just don't have the time."

Sysco's energy champion roles are nearly always assigned to the facility maintenance director. This person manages a wide breadth of responsibilities, and energy is just one slice. Similarly, many SEM energy champions are not full-time energy managers, but instead have a range of responsibilities related to facilities, maintenance, engineering, and/or sustainability. SEM programs can provide more value to these energy champions by providing them tangible tools, along with coaching, to track energy performance and drive accountability.

Energy Tracking Creates Culture Change

In addition to creating energy accountability, we have observed how Sysco's energy performance tracking creates culture change. Energy performance is a standard agenda item on regional maintenance calls and conferences, where energy project ideas are shared amongst peers. Program managers have witnessed numerous facility managers turn from skeptics to advocates as the visible impact of energy projects accumulates and they receive recognition for their efforts. For example:

- After a facility was acquired by Sysco and brought into the EM program, the facility manager was given an energy efficiency KPI for the first time. He chose to part ways

with a longtime maintenance contractor who did not prioritize energy efficiency and found a replacement contractor willing to improve efficiency.

- Through daily energy performance reporting, a facility manager was able to identify the night crew was not turning off dock lights at the end of their shift. He shared the daily reports with operations staff so they could review standard operations procedures with their shift managers.
- While investigating high demand charges on several recent electric bills, a facility manager noticed spikes occurring on daily energy reports around the same time every day. He determined that the spikes were caused when the pallet jacks used during the morning shift were all plugged in to recharge during the lunch break. Staggering when the jacks were plugged in mitigated these spikes and reduced their peak demand costs.

Culture Change Characteristics

The characteristics that create culture change overlap closely with those that create energy accountability. We explore these characteristics separately below, as they apply specifically to creating culture change.

Be consistent. Culture change starts with forming habits. Energy reporting lands in every facility manager's inbox each day, week, and month. For many participants, this repetition drives a habit to keep close tabs on the facility energy profile. When the profile changes unexpectedly, a facility manager in the habit of regularly scanning energy reports will be more likely to perceive the shift and take investigative action. Additionally, as energy savings are tracked over a longer period, the growing impact of energy projects becomes more visible. When SEM participants see the impact of their work, they are motivated to tackle more energy projects.

The following figure shows a section of a weekly energy report pushed via email to facility managers.

Weekly Summary

	Last Week *vs 4 wk avg*			4 Wk Avg *vs previous year 4 wk avg*		
Energy Used:	95,124 kWh	▼	2%	97,433 kWh	▲	3%
WB Temp:	63 F	▲	1 F	62 F	▲	2 F
Estimated Cost:	$10,749	▼	2%	$11,010	▲	3%
Data complete status			100.0%	Data complete status		100.0%

1. Energy costs are calculated assuming $0.11/kWh - the site's average 2015 energy cost.
2. The previous year four week average period runs from 6/24/19 to 7/21/19.

Hourly Energy Profile Review

Last Week (7/13/2020 to 7/19/2020)

Red and green squares represent high and low periods of hourly energy consumption last week. The minimum and maximum values are labeled.

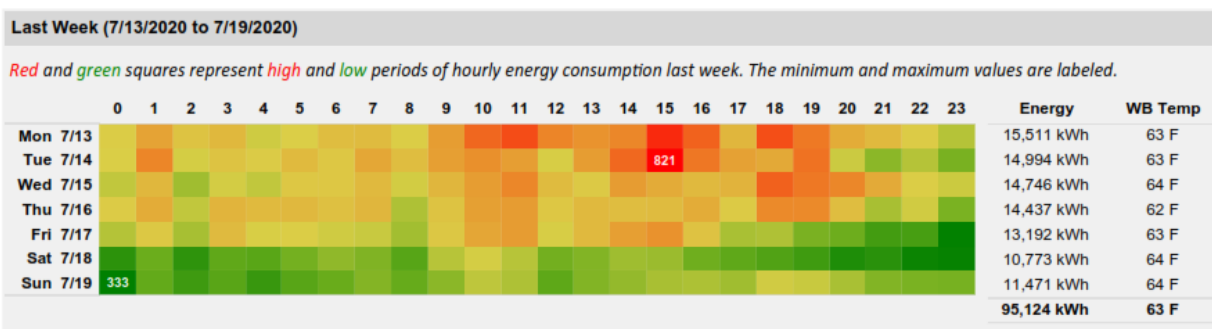|	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	Energy	WB Temp
Mon 7/13		15,511 kWh	63 F
Tue 7/14	821	14,994 kWh	63 F
Wed 7/15		14,746 kWh	64 F
Thu 7/16		14,437 kWh	62 F
Fri 7/17		13,192 kWh	63 F
Sat 7/18		10,773 kWh	64 F
Sun 7/19	333	11,471 kWh	64 F
		95,124 kWh	63 F

Figure 3: Trend and heat map sections from a weekly energy performance report. Source: Cascade 2020b

Be clear. Culture change requires a shared language around objectives and goals. Most employees cannot conceptualize the impact of saving 457,832 kWh but will be motivated by saving $50,000 or reducing facility energy use by 6%.

Be fair. The Sysco EM program previously used a comparative efficiency metric to rank sites within a region. This metric was normalized by weather and facility size, however, newer facilities tended to always be ranked most efficient and older facilities fell to the bottom. This type of reporting did not send a fair message to participants. What could the old facilities possibly do to catch the new facilities other than ask for a new building? What would motivate the new facilities to get better when they knew they already landed on top? After experimentation, the program found that site-specific benchmarking gave each facility more clarity on their energy efficiency performance and in turn, this clarity helped facility managers rally their troops around achieving their energy goals. The program no longer comparatively ranks facilities.

Be timely. Again, culture change starts with forming habits. When energy performance reporting does not arrive when expected, routines get altered and procedures get dropped. Conversely, when a facility manager can rely on timely energy data, he or she can develop standard procedures in response to the data.

Be trusted. Culture change requires agents of change, and these agents of change—facility managers, corporate energy managers, and maintenance technicians—need to operate with the

conviction and confidence that the numbers can be trusted. If these agents of change lose trust in the energy performance reporting, they have one less tool in their toolkit to rally the troops.

Applicability to SEM

Culture change is a core element of SEM engagements. Specifically, SEM is intended to train facilities to implement lasting energy improvement processes, and SEM participants have been shown to complete more energy projects and maintain persistent savings (Batmale, Crumrine, and Huth 2013; Eskil, et al. 2015). Sysco's energy culture has powered the program to achieve year-over-year savings for 14 years in a row. The vast majority of DSM SEM engagements are significantly shorter, which places an even higher importance on seeding culture change within the engagement window.

Repetition is a fundamental for creating culture change, and repetition of energy performance tracking has changed energy culture at Sysco. Energy reporting lands in energy champion inboxes every day, week, and month. This strategy to serve data to the participant rather than asking the participant to proactively find the data has been effective to improve the volume of report views. In turn, frequent viewing of energy data familiarizes energy teams with their energy profiles and positions the team to detect and act on backsliding faster. Helping SEM participants form an energy tracking habit during the active engagement phase improves the chance they will continue with long-term tracking down the road.

Sysco has succeeded at messaging the sheer impact of energy savings over time, which is an important tool to quiet naysayers and gain momentum for more energy projects. In a previous program year report, Sysco shares both internally and publicly that they have avoided $317 million in electric costs since starting the energy management program. That messaging resonates deeply and was only possible because performance tracking reached back 10 years. SEM participants will have similarly impressive results after 10 years of continual improvement, but if the groundwork is not laid for performance tracking then the results may be more difficult to quantify and socialize.

Technologies to Scale Energy Performance Tracking

Previously we discussed how energy performance tracking creates accountability and culture change in the Sysco EM program, and the key characteristics of this success. Now we will examine how key technologies enable the program to deliver these characteristics of success at scale.

People, Not Technology

Before we discuss technology in detail, we will clarify an important truth: people are the reason for the success of Sysco's EM program. Technologies related to energy performance reporting are the focus of this paper, and these technologies empower people to make the program succeed. But technology cannot replace people in a successful EM program. The technologies we discuss in this paper do not troubleshoot performance backsliding, they do not control equipment, and they do not make decisions about how to save energy. People do those things!

Data Management Technologies

Sysco's energy management collaboration software (EMCS) powers the energy performance reporting used to create energy accountability and culture change. The ECMS serves as the central database for EM program data, as well as the front-end hub for EM program stakeholders. The software processes 17,500,000 rows of data every year from 5,000 data streams including utility bills, interval meters, weather stations, and Sysco databases. Additionally, the software tracks 6,000 active or completed energy projects.

Over 130 facility managers and their teams, plus corporate sponsors and energy efficiency consultants, need secure access to this data. Sysco stakeholders can access the EMCS through a secure login or receive reporting through email as discussed in the following section.

By storing program data in a central web-based hub, Sysco achieves the following:

- **Energy data is reported in near real-time.** Instead of relying on a myriad of utility smart meter technologies and individual login credentials, Sysco has installed data acquisition hardware at every facility to transmit utility meter pulse data via cellular network.
- **Bill tracking is standardized.** Bills for all energy sources and water live in one database, simplifying Sysco's carbon disclosure reporting.
- **Interval data and electric bills live in the same system.** Systematic quality control processes compare the two data sources to identify errors.
- **Quality control is standardized.** One central hub for data means less potential for error and more opportunities for bulk quality control steps.
- **The energy management experience is standardized across the corporation.** Regional and corporate maintenance managers can see roll-up performance reporting for the sites in their purview.
- **Actions are connected to results**. By putting the energy project opportunity register in the same platform as energy performance tracking, stakeholders have a central repository to manage energy projects and immediately see the impact on energy performance.
- **Historical data is accessible.** Fifteen years of data lives in one system, eliminating the need to hunt for archived spreadsheets and databases.
- **Data is secure**: the software meets key requirements to keep data encrypted and safe.

A handful of commercially-available software packages can satisfy these requirements out of the box. This paper will not discuss individual software solutions. Sysco switched software packages in 2015 to their current platform, which provides enhanced features to achieve the requirements listed above. Key features include tools to manage data acquisition hardware at scale, flexible email-based reporting, standardized bill tracking, energy project tracking, and an extract, transform, load (ETL) that connects data to a reporting database where energy reporting is created using a common business intelligence software platform. Aside from Sysco-specific data integration, the software required no customization to meet Sysco's requirements.

While honing data collection processes since 2005, the Sysco EM program has learned that the cost of installing and maintaining data acquisition hardware is justified by the accuracy, timeliness, and reliability of the data. Less reliable data acquisition leads to performance reporting delays, which leads to cost increases when backsliding identification and recovery is

slowed. The program's 142 facilities are spread across over 90 electric utilities, and it is cost-prohibitive to create a unique interval data pipeline from each utility. Additionally, by shortening and simplifying the data pipeline, the program reduces reliability risks. If advanced metering infrastructure (AMI) data becomes more standardized and reliable across utilities through initiatives such as Green Button Connect, the program may be able to reduce reliance on data acquisition hardware.

Reporting Technologies

Sysco uses two main platforms to deliver energy reporting to stakeholders.

- A data visualization software package is synced with the ECMS database and used to generate monthly performance reporting that is subsequently emailed to stakeholders. This software allows the Sysco EM program to build powerful reporting that rolls up from the site level to the regional and corporate levels. It also provides program staff with data quality control tools and ad-hoc analysis and reporting.
- Sysco's ECMS emails scheduled reports to key stakeholders. Program staff manage these scheduled reports to minimize user software training requirements. These reports focus on short-term (daily, weekly and monthly) comparative analysis, rather than long-term performance.

Both reporting options rely on pushing data through email. This is a purposeful decision. As previously discussed, Sysco's energy champions are usually facility directors for whom energy is one small slice of their job duties. In today's software solution-driven world, an energy champion may already be expected to master a dozen software platforms across their other job duties. Rather than positioning the ECMS as yet another platform to master, our research and login data show that Sysco's energy champions prefer to access their energy performance reporting through a tool they already use every day: Microsoft Outlook. Sysco's direct engagement with their software platform is not how value is measured. Value is measured by the reliability of the platform and the insight and accountability that it provides.

Applicability To SEM

Energy management information systems (EMIS) are not new to SEM programs but have typically been implemented on a per-participant basis as opposed to a programmatic rollout. SEM programs in California, the Pacific Northwest, the Midwest, and Nova Scotia integrate or include funding for EMIS into SEM programs, with a focus on using the EMIS component to add value to individual participant engagements (Rogers, Whitlock, and Rohrer 2019). Some of these programs rely on existing EMIS hardware and software at participating facilities and others provide funding for participants to select their preferred EMIS platform. While each EMIS provides targeted value to the participant, the lack of a programmatic rollout decreases the benefit to both the participant and the SEM program implementer because the decentralized EMIS platforms cannot be used as part of a holistic program design.

Many SEM programs struggle to systematically provide energy performance reporting that meets the characteristics needed to create energy accountability and culture change because of three key limitations:

- **Technology limitation.** Our investigation of DSM SEM programs suggests that most programs working on the scale of dozens of facilities track energy savings on a per-facility basis using a Microsoft Excel-based performance tracking tool. Data is commonly acquired by manually reading participant bills or downloading interval data at the account level from the utility's customer portal. The manual nature of data management increases the cost and time associated with systematic energy reporting.
- **Structural limitation.** Utilities may have the technology to acquire interval energy data from advanced metering infrastructure (AMI) but they may not have an effective system to share data with the DSM program. While many utilities provide an online portal for customers to view and download AMI data for one account, few portals allow DSM programs and implementers to connect programmatically to many accounts. In an ACEEE survey of 52 utilities, most were underutilizing AMI data and "should take steps to maximize AMI to save energy" (Gold, Waters, and York 2020). Policies and strategies to provide DSM programs with timely and accurate smart meter data improve the program's ability to foster energy accountability. The Green Button Connect My Data standard led by the Green Button Alliance has helped some utilities empower DSM implementers with better access to interval data but is not yet widely adopted.
- **Programmatic limitation.** Some SEM programs do not require systematic energy performance tracking, and therefore implementers may not offer it.

Many DSM programs have developed strategic plans that call for increasing savings from SEM and expanding the number of commercial and industrial participants in SEM programs. The technology and programmatic limitations discussed above have the potential to dampen these scaling opportunities. As one SEM program manager has noted, "It's hard to scale MS Excel to more sites than you can count on your fingers and toes." Conversely, energy performance tracking technology can help SEM programs scale to more participants and longer engagements. Performance tracking technologies provide a view into energy savings across an entire portfolio, which gives program managers valuable insight into savings forecasts and stalled engagements. While program managers use performance tracking for portfolio-level insight, implementation teams can use the same systems to create energy accountability and culture change within each participant's engagement.

Sysco's program has achieved year-over-year savings for nearly 15 years. Long-term energy performance tracking could help extend the measure life and cost-effectiveness of SEM engagements. Additionally, performance tracking technologies may improve evaluation effectiveness by managing consistent and complete data that can be made more readily accessible to evaluators.

Lastly, this case study shows that a large corporation had an appetite to hire outside consultants to set up and manage long-term energy performance tracking. There are likely many other corporations of all sizes with similar appetites, and their facilities are prime recruits for DSM SEM programs. Sysco's experience suggests that potential SEM participants will get more value from a program that includes systematized energy performance tracking.

Conclusion

This paper presents a case study detailing how Sysco tracks and reports energy performance for 142 sites. Keeping score of an SEM program of this scale is untenable without successfully automating the process, but this only tells part of the story. Through effective and

systematic energy performance tracking, Sysco has created energy accountability and culture change throughout their organization that puts more points on the scoreboard. Consistency, clarity, fairness, timeliness, and trust are all required for performance tracking to succeed at those two goals. To cost-effectively scale performance tracking to 142 facilities, Sysco uses an ECMS to serve as the back-end database and front-end hub for its EM program. Sysco's approach has led to 15 years of year-over-year savings improvement.

Similar energy performance tracking could help SEM programs scale to more participants and longer engagements by providing participant energy champions with a toolkit to create energy accountability and culture change. Adopting an ECMS as the hub for SEM can enable cost-effective energy performance tracking at scale across hundreds of participating facilities.

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