Accelerating the Benefits of Food and Beverage Sustainability Programs: A Best Practices Guide

by Meriah Jamieson and Eric Lemaire

Executive summary

Food and Beverage manufacturers can strengthen their brand and mitigate business risks by providing more transparency to their customers and stakeholders. Customers want to know more about the brands they buy, and regulatory agencies want to ensure food and beverage manufacturers are environmentally and socially responsible. This white paper demonstrates how using a plan / do / check / act methodology to drive energy management and sustainability programs can lower costs, improve profitability, and control risk.
Introduction

Compared to other industries, the Food and Beverage (F&B) industry leads the way in terms of the development and deployment of sustainability programs. F&B manufacturers have improved the efficiency of their facilities, invested in renewable energy, and managed the sustainability of their supply chains in order to lower the impact on the environment. The F&B industry has met the requirements of global and local legislation, and leads all sectors in sustainability disclosure¹ (see Figure 1).

However, persistent global resource shortages, increased energy and commodity prices, and tougher governmental regulations are all challenging F&B organizations to increase transparency of operations. It is estimated that 10% of the world’s emissions come from manufacturing, and that a 26% improvement potential exists for manufacturing firms worldwide.²

This paper proposes an integrated sustainability and energy management program which embraces a structured approach called “Plan / Do / Check / Act” (PDCA). This PDCA process has been deployed across the globe and has resulted in reduced costs, increased profitability, lower carbon emissions, mitigated business risk, and improved corporate image for F&B organizations.

The ISO 50001 quality standard itself is based on PDCA, (see Schneider Electric white paper “ISO 50001: Recommendations for Compliance”) and the PDCA method is a recommended starting point for launching an energy and sustainability management program. The purpose of PDCA is to integrate energy management and sustainability into daily organizational practices.

Below is a summary of the steps involved in the PDCA methodology:

- **Plan** – This step involves the development of the sustainability and energy management goal roadmap. During this step, energy and sustainability goals and targets are defined and action plans are formalized.
- **Do** – In this step, ISO 50001 quality practices are implemented. Efficiency initiatives are prioritized and deployed. Metrics such as energy, water, waste, and supplier compliance are tracked.
- **Check** – Efficiency measures are monitored. Measurements and KPIs are reported in order to ascertain how much progress is being made.

² Global Industrial Energy Efficiency Benchmarking, United Nations Industrial Development Organization
• **Act** – If significant differences exist between actual and planned energy savings results, analysis is conducted to determine root cause. New efficiency or savings opportunities are identified. Established best practices are shared across the organization. Energy and sustainability activities are integrated into the way of doing business in order to ensure continuous improvement.

Sustainability and energy management are synergistic programs, and should be run in parallel to ensure maximum results. Together, these initiatives form a cohesive plan that can improve efficiency and reduce costs.

Energy management and sustainability initiatives have a tangible ROI, and results can be measured by monitoring consumption trends. In the past, since tangible results from sustainability programs were hard to measure, executives were hesitant to fund such projects. However, recent studies link sustainability metrics directly to measurements of brand strength. Below are extracts from numerous studies that illustrate sustainability benefits.

### Higher profit margin

A comparison of manufacturing companies listed on the Dow Jones Sustainability Index demonstrates that these companies significantly outperformed their peers in terms of profit margin (see **Figure 2**).

![Figure 2](comparison_of_profit_margin.png)

**Figure 2**

*Comparison of sustainability index firms’ profit margin performance to peer manufacturing companies (Source IDC 2008)*

### Rising stock prices

In another study, when firms issued press releases voluntarily disclosing carbon emission information, researchers tracked stock prices. In the days following the press releases, the companies saw their stock prices increase significantly. In fact, the sampling of companies who publicly disclosed their green house gas emissions received an aggregate market value boost from their CSR newswire releases of approximately 10 billion dollars, according to the researchers involved in the study.³

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³ CSR, The Link Between Brand Value and Sustainability, 2013

⁴ UC Davis study, Going Green: Market Reaction to CSR Newswire Releases,
Increase in high value customers

On the consumer side, a study revealed that sustainability considerations drive or influence the buying decisions of more than half the shoppers interviewed. These “green” shoppers tend to become loyal to green products once they have tried them, and have a higher lifetime value.

Increased employee engagement

Many Food and Beverage manufacturers are becoming more focused on talent management and retention issues as recruitment becomes more challenging. Companies seen by potential employees as sustainable find it easier to recruit new talent, and find their workforce more engaged.

More executive buy-in

A recent study showed 72% of CEOs believe strengthening brand reputation and trust among consumers and governments is the “strongest motivator for taking action on sustainability.” In addition, a recent Deloitte survey of the Food and Beverage (F&B) industry reveals that 49% of F&B CFOs perceive a significant link between sustainability performance and financial performance.

Challenges

A number of challenges complicate the task of establishing an effective sustainability and energy management roadmap:

- Energy performance varies widely depending on processes used in manufacturing, making it very difficult to benchmark
- Processes that already result in efficiency gains require continuous support in order to maintain the gains that have been realized
- The “low hanging fruit” of obvious efficiency gains have often already been picked. As goals to increase efficiency increase, new efficiency improvements can be more difficult to find and implement.

These challenges can be overcome by deploying a number of Plan / Do / Check / Act (PDCA) best practices that have been implemented by other organizations.

Best Practices

The best practices listed in Table 1 summarize some of the key steps involved in the PDCA process. Overall, the emphasis is on both ISO 50001 compliance to integrate energy and sustainability management and corporate goals, and the establishment of internal processes that foster continuous improvement. Once this groundwork has been established, efficiency initiatives can be launched to reduce both costs and consumption. Detailed reporting should be the output of close monitoring so that progress can be quantified. Also critical is communication to stakeholders so that they can remain engaged in the process.

One example of a typical sustainability and energy management F&B project would be an initiative to reduce the resource consumption of a clean-in-place (CIP) system. Efficiency levels in this area can easily be improved by 20% (see Schneider Electric white paper “How to Optimize Clean-in-Place (CIP) Processes in Food and Beverage Operations” for more information).

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5 Deloitte, Finding the green in today’s shoppers
6 Accenture, “A New Era of Sustainability: UN Global Compact-Accenture CEO Study”, 2010
7 Deloitte, “Sustainability: CFOs are coming to the table”, White paper, 2012
information). A 20% reduction in cleaning time delivers approximately an extra hour of production time to each day.

A large dairy manufacturer wanted to implement a corporate-wide sustainability and energy management program to reduce costs and help grow their business. Their business strategy was to leverage a strong sustainability record in order to differentiate themselves from the competition and become the leading market brand. One goal was to increase gross margin through better management of operating expenses. A second goal was to increase sales by providing more consumer transparency to their operational practices.

Table 1
PDCA best practices drive work streams which achieve the highest savings and efficiencies

<table>
<thead>
<tr>
<th>Step</th>
<th>Best Practice</th>
<th>Business impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>PLAN: Sustainability strategy development</td>
<td>Develop sustainability goals that complement organizational goals, identify resources, create an action plan</td>
<td>Generates multiple stakeholder buy-in. Provides structure and process to measure success and increases likelihood of attaining goals.</td>
</tr>
<tr>
<td>PLAN: ISO 50001 compliance</td>
<td>Provide a framework to reduce consumption while improving efficiency, based on Plan, Do, Check, Act framework</td>
<td>Results in leaner, more efficient operation, ISO 50001 certification</td>
</tr>
<tr>
<td>DO: Strategic energy procurement</td>
<td>Implement strategic energy sourcing to optimize energy purchases, rates, and tariffs. Perform market research to identify opportunities to save, and mitigate risk</td>
<td>Reduces energy supply cost and mitigation of energy price risk.</td>
</tr>
<tr>
<td>DO: Energy and data collection infrastructure</td>
<td>Determine the business KPI’s to be measured and define infrastructure required to collect this data</td>
<td>Monitors energy and resource consumption to benchmark current performance, eliminating inefficient manual processes</td>
</tr>
<tr>
<td>CHECK: Energy and resource data reporting and analytics</td>
<td>Eliminate manual processes and collect and aggregate device data (meters and sensors) across all sites and perform analytics to recommend highest ROI initiatives</td>
<td>Energy and carbon reports identify anomalies and inefficiencies. This can reduce consumption and lower costs, yielding increased project ROI</td>
</tr>
<tr>
<td>CHECK: Efficiency assessments and projects</td>
<td>Identify energy and resource conservation opportunities via onsite or remote audits and workshops</td>
<td>Reduces costs by finding short and long term efficiency opportunities</td>
</tr>
<tr>
<td>ACT: Plan and prioritize projects</td>
<td>Consolidate initiatives onto one platform and determine the most cost-effective and sustainable opportunities</td>
<td>Streamlines processes, Identifies projects with the highest ROI</td>
</tr>
<tr>
<td>ACT: Communicate sustainability efforts</td>
<td>Share sustainability metrics through internal and external channels, such as websites, social media, PR.</td>
<td>Gains market share, builds brand, satisfies investor concerns and galvanizes employees</td>
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Case Study 1: Solidifying market position

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Plan

Senior management faced a number of challenges in trying to fulfill their vision. First, their plants were located in different countries. Cultural anomalies, language differences, and varying sets of government agency regulations made any type of broad rollout more complex. Yet, a critical factor in launching their corporate initiative was the need for achieving a high adoption rate.
The organization was also faced with a limited pool of internal resources from which to drive the program. In addition, existing sustainability and continuous improvement efforts had to be integrated into the new effort.

The dairy manufacturer worked with the Schneider Electric team to build a business case and define the program, and to prioritize sites. The initial target site for the program was selected based on site production, site team resources, and technical configuration (see Figure 3), and had the following unique characteristics:

- High fluctuations in individual plant production created benchmarking challenges
- Energy consumption rates varied widely, from 236-846 kWh / ton
- The site consisted of varied building types: offices, labs, a warehouse, and production lines
- The site was also populated with chillers, boilers, a water treatment plant, and air compressors
- Energy costs totaled $2.1 million / year for the site
- Power consumption during peak hours was 1.5 times more expensive than off-peak hours

**Figure 3**
Factors that drove the selection of the first targeted site

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**Do**

Site assessments and audits were performed to gather in depth data on facility consumption. Energy metering was installed where needed to capture data needed for performance monitoring. The metering deployment consisted of devices capable of measuring water, air, gas, electricity, and steam consumption. Dynamic energy dashboards were utilized to display information about site operation and energy consumption (see Figure 4).

Energy and resource consumption data was reported and analyzed, including high consumption areas such as pasteurization. Multiple opportunities for efficiency were uncovered using this methodology. For example, the data revealed that the site's cleaning system was consuming too much energy, and taking too much time. More efficient cleaning systems were deployed which consumed less energy and cleaned more rapidly, thus reducing consumption.
The energy management system included variable speed motors for ventilation, indoor and outdoor lighting control, smart thermostats, and time-programmable HVAC systems. Schneider Electric experts identified both process and technology improvements to ensure that the site only used the energy it needed.

On the energy procurement side, Schneider Electric’s energy procurement team analyzed the company’s energy bills and developed an energy sourcing analysis. This analysis included risk and tariff assessments, not an easy task as tariff definitions can be from 4 – 15 pages long. By understanding the charges and the variables that were involved in generating those charges the team was able to further reduce energy costs.

**Check & Act**

This dairy manufacturer deployed new sustainability and energy management practices in stages, measured their progress, and achieved their goals in just over 3 years. During that period they transformed resource data into useful business information that helped them identify efficiencies and cut costs.

Financial margins were protected by both minimizing regulatory risk exposure and by tighter control on energy spend. The projects achieved a two-year payback period, in part due to equipment upgrades to the initial pilot site, which resulted in a savings of $82,000 US per year. The initial pilot was deemed a success; the best practices were shared among all 30 manufacturing sites. Energy and resource data will be continuously monitored and further initiatives prioritized according to return on investment.

**Case Study 2: Achieving sustainability targets**

To address regulations and build customer loyalty, a Food and Beverage manufacturer decided to address greenhouse gas emissions, water and energy consumption, packaging waste, and supply chain efficiencies.

**Plan**

As a first step, this particular F&B manufacturer gathered data on their current performance to establish a baseline. They used a software as a service solution tool to collect electricity, water, and, waste data for all their sites. Once the baseline was established, they engaged...
Schneider Electric to help establish performance improvement goals for each metric. Input into the process included data specific to competitor activities, and alignment of sustainability strategic goals.

The following aggressive targets were set:

- 30% reduction of GHG emissions
- 30% increase in energy efficiency per liter of product produced
- 10% decrease in water consumption per liter of product produced
- 0% waste in landfills from their facilities

Do

Once the strategy and key performance metrics were established, action plans were put in place to improve site performance. Site assessments were performed to prioritize efficiency improvements. These improvements were rolled out in the context of energy and water optimization projects and helped reduce consumption in a significant way.

Efficiency initiatives included:

- Water optimization projects
- Increased water reuse
- Improvements to packaging to reduce plastic
- Audits to find site inefficiencies, resulting in 10% reduction in energy consumption
- New buildings designed to meet NABERS and LEED standards, including renewable energy generation

Check & Act

Sites were ranked against each other to identify top performers, based on defined sustainability metrics. Best practices from top performers were shared to increase performance at all facilities. Facilities are monitored on an ongoing basis, and anomalies reported and analyzed to identify additional efficiencies.

To this point the sustainability and energy management program has produced impressive results. This particular manufacturer exceeded their GHG emissions and energy efficiency targets, and reduced emissions by 48% per unit of product, while continuing to grow their business.
Sustainability and energy management programs reduce costs, increase efficiency, strengthen customer brand loyalty, reduce environmental impact, and allow F&B manufacturers to comply with regulations. Sustainability successes help organizations to outperform competitors in an environment characterized by difficult market conditions.

Energy and sustainability management programs mitigate the risk of increasing commodity and energy prices, and a well executed program can reduce energy costs by 10 to 30%. Knowledgeable consultants add value by identifying hidden energy savings and sustainability opportunities within F&B manufacturing plants, allowing F&B executives to focus on their core business of production and delivery.

A recommended approach for F&B manufacturers is to deploy the Plan Do Check Act (PDCA) approach. Plan Do Check Act is the basis of ISO50001, the logical starting point for an energy and sustainability management program in an F&B environment. The PDCA continuous improvement framework integrates energy management and sustainability into daily operational practices and allows for long term savings.

About the authors

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