Graded Case Study 1, Part I

Project Selection

Fabricant Corporation manufactures and distributes highly specialized metal parts to over 1,000 clients across the Northeast. With state-of-the-art facilities, Fabricant is the leader in designing, prototyping, and manufacturing engineering flexible materials for solar power, medical, aerospace, and electric power applications.

As Fabricant has grown and expanded its base of shareholders, its mission has evolved from merely providing quality products at a competitive price. Today, the company strives to create shareholder value and demonstrate corporate social responsibility by continuing to be a leader in energy conservation, research, and development of advanced technologies.

Lee Feinberg, the company's CEO, is eager to live up to Fabricant's public commitment by engaging in activities that drive continuous improvement on key sustainability metrics. Specifically, he has tasked his senior management team to propose projects that will align with the following objectives:

1. Reduce energy consumption by a minimum of 20%
2. Raise community consciousness of environmental issues and concerns
3. Generate a return on investment of at least 15%

After several months of research by her staff, Janice Scott, the Head of Strategic Planning for Fabricant, brought the following project proposals for consideration:

1. Solar panel installation on the main manufacturing facility

This 200,000 square foot manufacturing facility consumes 9.5 million kWh of electricity per year. The facility has just over two acres of rooftop that is suitable for solar panel placement. According to estimates, this installation would generate about 700,000 kWh of renewable energy per year, while offsetting over 500 tons of CO_2. The installation of 1,500 240-watt photovoltaic cells would cost about $700,000, net of federal investment tax credits. With estimated energy savings of $50,000 per year and annual solar renewable energy credits (SRECs) revenue of $70,000 per year, the solar panel investment is expected to break even in 5.6 years, with a 10-year return on investment of 20% ($120,000 per year for 10 years, with a discount rate of 7%).

This facility is also in a highly visible location adjacent to a major highway, with 300,000 people driving past the building on a daily basis. The public exposure to the facility's solar array will raise community awareness to renewable energy sources and create positive perception for Fabricant's commitment to environmental sustainability.

2. Interior and exterior retrofit of industrial lighting throughout facilities

The second project proposal involves replacing high energy consumption lighting fixtures in all Fabricant facilities with more efficient technologies, including the following:

- Replace metal halides with LED technologies
- Replace T-12 fluorescent lighting to T-8 Vaportite fixtures
- Retrofit offices and break rooms with sensors and new fluorescent fixtures
- Install wireless sensors and motion detectors throughout offices, production stations, and break rooms to automatically turn off lights

These changes are estimated to produce energy savings of over 1.1 million kWh per year as well as $142,000 annually in utility costs. After energy efficiency incentives and utility partner rebates, Fabricant's total cost of the upgrades is expected to be in the $65,000 to $75,000 range so the program will provide immediate financial and environmental returns. In the first year alone, this program is likely to produce an 89% ROI.

To generate positive community and client awareness for this sustainability initiative, Scott recommends that Fabricant include the results in the company's newsletter and client literature, and on its website.

3. Adoption of less energy intensive welding processes in production facilities

A third proposal is to shift from traditional fusion welding processes (arc welding and laser welding) to friction stir welding (FSW). In addition to providing solutions for persistent joining problems, FSW consumes less material and energy while reducing fumes and gases. The proposed project is to develop a prototype system that proves the suitability of FSW for a range of Fabricant's welding situations (e.g., engine components, high performance aircraft parts, fuel tanks, etc.). Based on a feasibility study using the prototype, the team will decide whether to pursue implementation of a FSW process development plan (including design, controls, and process knowledge) at 12 welding workstations.

FSW reduces welding energy and material consumption by as much as 70% (estimated savings of $2,000 per machine), compared to traditional arc welding techniques. Finally, FSW saves a considerable amount of welding time, compared to arc welding, due to higher welding speed and fewer ancillary processes. In all, Scott expects a shift to FSW, where feasible, to save $24,000 per year.

FSW machine investment, licenses, tools, and personnel training would be approximately $400,000. The expected life of FSW equipment is five years.

Scott believes Fabricant's clients, especially government entities, will perceive the use of FSW process and technology to be a competitive advantage, indicating high quality, cost effectiveness and energy efficiency.

Before you move on to the next section of the case study, identify the problems and/or issues that you'll need to include in your analysis. Document this information, and consider how you will integrate it into your evaluation of the project.