

Course Learning Outcomes for Unit VII

Upon completion of this unit, students should be able to:

7. Formulate strategies for solving industrial waste related problems.
 - 7.1 Consider the role of corporate social responsibility in waste strategies.
 - 7.2 Evaluate proactive strategies for industrial waste management.

Course/Unit Learning Outcomes	Learning Activity
7.1, 7.2	Unit Lesson Article: "Determinants of Monetary Penalties for Environmental Violations" Unit VII Case Study

Required Unit Resources

In order to access the following resource, click the link below.

Habib, A., & Bhuiyan, B. U. (2017). [Determinants of monetary penalties for environmental violations](https://libraryresources.columbiasouthern.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=124970148&site=ehost-live&scope=site). *Business Strategy and the Environment*, 26(6), 754–775. Retrieved from <https://libraryresources.columbiasouthern.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=bsu&AN=124970148&site=ehost-live&scope=site>

Unit Lesson

Introduction

Unit VI focused on engineering principles. This unit transitions to formulation of strategies for solving industrial waste problems. The chief executive officer (CEO) and board of directors (if present) guide the direction of the company. Management follows the strategy set by the CEO and the board. Management principles guide the staff further down the company's hierarchical structure. However, rather than always being top-down, most companies encourage all workers to provide suggestions up the chain of command to improve the company. Some of the suggestions may be received positively by the board and CEO and instituted into the company's practices. Other suggestions may simply be instituted by lower-level management without the need to necessarily inform those above. This can sometimes be problematic if there are unforeseen conflicts with long-term strategies.



(Habib & Bhuiyan, 2017)

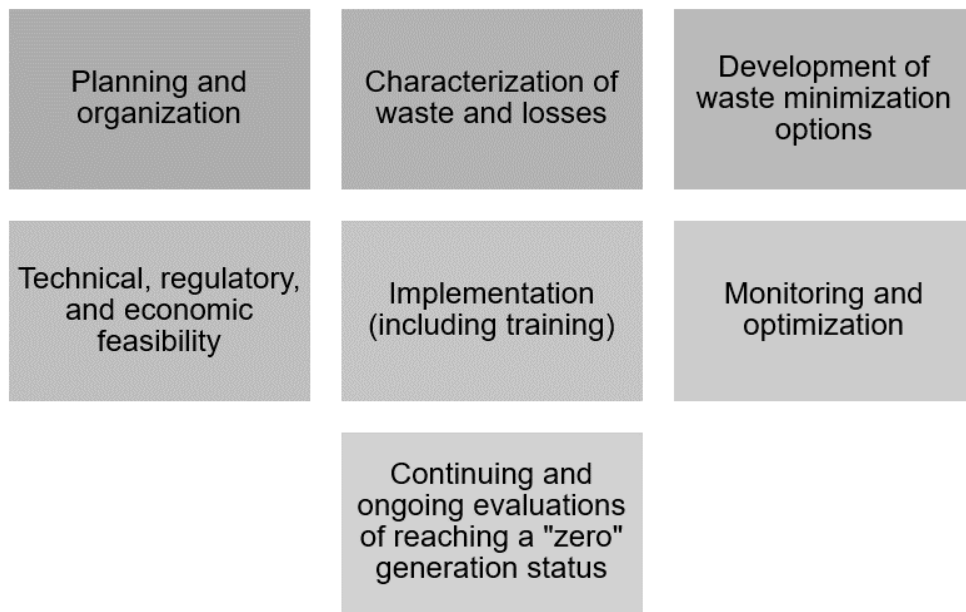
Corporate strategies can be highly variable regarding industrial waste. Companies are somewhere on the continuum between proactive and reactive. With regards to industrial waste, a proactive company follows the principles of corporate social responsibility (CSR) and implements pollution prevention practices (Habib & Bhuiyan, 2017). A reactive company does things as usual, fights environmental fines, and makes changes only when it is obvious that the costs of continuing to fight regulatory agencies outweigh costs of making changes. Following a brief discussion of reactive strategies, this lesson will provide an in-depth presentation of proactive strategies.

Reactive Strategies

A company can decide to be reactive in regard to its industrial waste. A reactive strategy involves continuing to do things as they have been done in the past. Some companies prefer reactive strategies because they feel that costs are predictable. Making changes to be more environmentally friendly or even to reduce long-term costs requires more up-front costs with no absolute guarantee of future savings. Reactive companies look at the long-term and see many variables. Maybe a hurricane hits their plant, a tornado wipes it out, employee strikes change the work situation, vital employees leave, new corporate board members join, safety or environmental regulations are weakened or tightened, and they continue as they have.

Proactive Strategies

On the other side of the continuum are companies with proactive strategies regarding their industrial waste. Proactive companies are not afraid of the future; they embrace the future and want to be leaders in enacting positive change for the environment and for the corporate bottom line. These companies plan well and consider contingencies like the reactive companies. Unlike reactive companies, proactive companies are confident in their future financial predictions and are willing to bet on future success. There are many proactive strategies available regarding industrial waste. LaGrega, Buckingham, and Evans (2001), indicate seven strategies for minimizing the generation of hazardous waste:



Planning and organization: Planning and organization require commitment from corporate leadership indicating that proactive strategies should be instigated. Individuals within departments are identified to lead the information-gathering.

Characterization of waste and losses: Once management has set the company on the course of being proactive, waste and losses are characterized. Depending on the company's record-keeping, this is one of the easiest or hardest steps in having a proactive strategy toward industrial waste. This step involves providing reports of waste production and energy overuse. This information may already be available in reports sent to regulatory agencies detailing monthly waste generation. If not already available, then additional staff may need to be hired temporarily to determine waste production. The losses portion might be more challenging since it involves identifying when energy is lost through inefficiencies such as poor insulation, processes not run at optimal conditions (e.g., temperature, pressure), or lack of sufficient chemicals (e.g., oxygen in a combustion process).

A pollution prevention (P2) audit is a useful tool for identifying waste and losses. A P2 audit is conducted by staff or by an outside consulting firm. It requires gathering data from records as well as walking around the production facilities to identify sources of liquid and gas leaks; accumulation of solid materials; identification of inefficient processes; and encouragement of basic, good housekeeping practices. A P2 audit may "open the eyes" of the company to obvious, easy environmental and cost-savings options. However, it will also identify more expensive fixes that need to be considered due to long-term cost implications (LaGrega et al., 2001).

Development of waste minimization options: A forward-looking strategy can begin once wastes and losses are characterized. Low-cost changes can involve source reduction. Maybe a P2 audit identified that instead of using the current quantity of raw material in a process, without any changes in equipment, the process can be just as good if only 90% of the raw material is used. This may be the case if excess raw material is found in the waste stream. Sometimes, it is as simple as changing the setting on a valve to reduce the inflow of a raw material. Maybe the valve was always set in a certain position and workers were told "keep the valve in this position." If it is not obvious that a simple fix can result in source reduction, additional monitoring sensors may need to be installed to ensure proper temperatures, pressures, flow rates, and chemical compositions to be sure the final product has the same quality as prior to the source reduction.

In addition to source reduction, waste minimization can be achieved by improving the efficiency of processes or by using alternative chemicals. Changing chemicals and processes may be a radical move, adding some trepidation about product quality. Thus, it is important to make trial runs by possibly using a research laboratory or an on-site pilot test.

Technical, regulatory, and economic feasibility: Continuing with waste minimization, the value of successful production using a more efficient process and more environmentally friendly chemicals can be seen in long-term reduction in costs for waste treatment and disposal. Further, environmental regulators would hopefully have a favorable view of the facility. Oftentimes, community organizations issue awards for corporate environmental stewardship. Further, product advertising can include the fact that the company cared about the environment. Advertising could say, for example, that "we care about the environment that our children are living in" when it decides to convert to greener processes and more environmentally-friendly chemicals to produce the quality product. All of these measures can enhance the long-term economics, offsetting up-front costs of new waste minimization efforts.

Implementation (including training): As discussed in the previous sub-section, for a proactive environmental strategy to be undertaken by a company, there must be high confidence in success of the changes. Part of the implementation of the new processes or chemical substitutions includes training of personnel. Effective training also instills a positive attitude toward the company since it is aiming to be a better environmental steward. Though the main purpose of the training is directed to enabling staff to successfully run the new processes and work with the alternative chemicals, the training can also emphasize management's desire to make a better world for its employees' families and the community by creating a healthier environment. This generally is a morale booster.

Monitoring and optimization: When new processes and chemicals are used to replace previous production methods, it is important to monitor the production process. This may involve the purchase of new sensor technology and software to monitor the data. The data acquisition and monitoring can help staff optimize production by spotting abnormalities in data. For instance, monitors could signal that more source chemical than expected is being output as waste. This might indicate that excess chemical is being fed into the process and that a lower feed rate can be used.

Continuing evaluations of reaching a zero generation status: A corporate strategy could be to reach zero waste generation by a certain date. A company with this very proactive strategy has a good chance of having a workforce with high morale. Employees want to do well, be challenged, take satisfaction in their work, and be rewarded. Working together toward zero waste generation is an exciting goal. Regardless of where the company is in its trajectory toward zero waste generation, management can instill the goal of zero generation.

The actual process of reaching zero waste generation requires detailed monitoring of waste production and having staff on the lookout for waste reduction opportunities. It is not prudent to implement every new waste reduction method that reaches the market. Major changes to processes cannot instantly be made. Rather, through regular evaluations and assessment of new technologies and how they mature and drop in cost, it might be reasonable to consider updating a process every few years. If processes are updated too rapidly, technical staff will get weary of coming up to speed on a new process, getting good at implementing and monitoring the process, and then being told that it's going to change. Staff may feel that they are replaceable if new processes come along too rapidly. Since both new and seasoned staff would need the same training on a new process, long-time employees might feel a threat of losing their jobs to lesser-paid new hires.

Conclusion

This lesson has presented strategies for solving industrial waste problems and has considered reactive and proactive strategies. A company may tend to do business as usual and wait for fines from regulators prior to making changes. This, in fact, may be a cost-effective strategy. It also may be used by risk-averse companies. However, another strategy is to be proactive. This requires decision makers who embrace change and wish to be forward-looking environmentally while at the same time be cost effective. Before embarking on process and chemical changes to reduce industrial waste, the company needs to be confident that the changes result in the same or better product quality than prior to changes.

References

- Habib, A., & Bhuiyan, B. U. (2017). Determinants of monetary penalties for environmental violations. *Business Strategy and the Environment*, 26(6), 754–775. Retrieved from <https://libraryresources.columbiasouthern.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=edsgao&AN=edsgcl.503187452&site=eds-live&scope=site>
- LaGrega, M. D., Buckingham, P. L., & Evans, J. C. (2001). *Hazardous waste management* (2nd ed.). Long Grove, IL: Waveland Press.

Suggested Unit Resources

In order to access the following resource, click the link below.

The following video is about life cycle assessment in the automobile industry focusing on a strategy to reduce waste. You may view the full video or select segments listed under the “Segments” tab to the right of the video.

Pumpkin TV (Producer). (2011). [Life-cycle assessment \[Video file\]](https://fod-infobase-com.libraryresources.columbiasouthern.edu/p_ViewVideo.aspx?xtid=44502&tScript=0). Retrieved from https://fod-infobase-com.libraryresources.columbiasouthern.edu/p_ViewVideo.aspx?xtid=44502&tScript=0

The transcript for this video can be found by clicking on “Transcript” in the gray bar to the right of the video in the Films on Demand database.