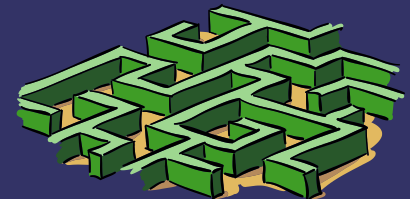


# *Reduction and reuse of energy consumed in the DMBTFE production process.*

## Acme Chemical Corp.

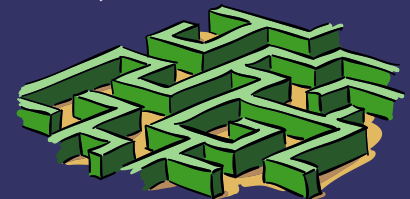
- Benefits of the system
- Efficiency
- Cost

By: Jonathan Stewart, C.F.O  
and Environmental committee  
member



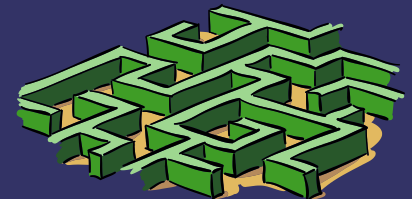
# Overview

- ➔ Being a large chemical company, involved with the handling of many kinds of waste, we must make it a duty of ours to make our plant and process as environmentally efficient and friendly as possible in the current state of affairs. By doing this, our customers will pay a premium for our services, knowing that we have the environment on our minds all the time, which will make any environmental undertaking cost-effective.



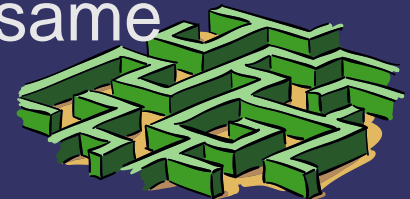
# Overview

- ➔ Our company should always be looking for new ways to cut costs and become more efficient.
- ➔ One of the ways we can do this is by reusing the waste we produce in our production process
- ➔ Some chemicals can not be re-used, but the energy lost at each step of our process can be captured and re-used easily.



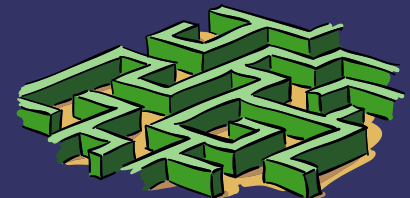
# *Long-term goal*

- In the next 5 years, we should begin moving to have a waste water reuse system put into place in our facility.
- At many steps in many chemical process's, water is used to cool or heat a mixture to prepare it for the next step. At the current moment, our waste water from cooling in our DMBTFE process, captures heat from the mixture(cooling it) and then is disposed of. If we could re-use and efficiently and economically cool this water after it has been used, we could pump it back through the factory to be used again in the same process



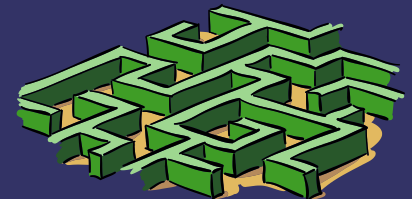
# *Financial Figures*

- The overall cost, in dollars, for this project will be about 2 million dollars. Not to fear, however, this cost will be spread out over the course of the 5 year development and construction time frame.
  - This figure drops to about \$400,000 annually, which is less than 25% of our annual profit
- Although we will need to tap into profits to finance this project, the returns will be huge, upwards of \$150,000 per year once the project is completed.(including both increased per unit revenue for environmental premium mentioned previously, decreased energy and water usage.)
  - This means that the project, once completed will pay for itself in less time than it took to develop and build it!!!



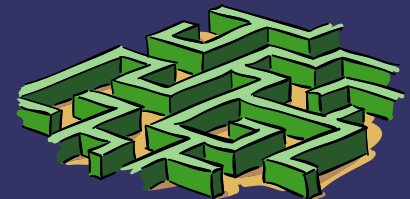
# *The Present Situation*

- At present, Our DMBTFE process needs to be cooled to between 50-60°F before DMBTFE can be separated from the mixture. This water, post product cooling, has a temperature of 80°F. This heated water can be reused and benefit us in two main ways
  - Reduction of outside energy usage through water turbines
  - Reduction of total water used in all of our processes at Acme.



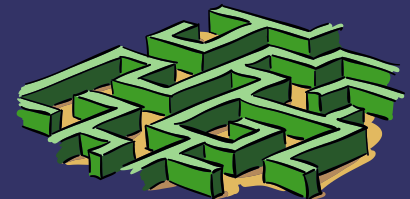
# *Energy Reduction*

- By creating a closed system for the water to pass through in our facility, we can capture the heat energy from the cooling process through the use of turbines
  - Heated water will rise after use in the process, passing through turbines, that will help power our lighting, Air-conditioning, computer, etc. systems.
- This heated water will naturally lose some of its heat, about 20 degrees to a temperature of 80°F just by passing through the turbines and being stored in storage tanks.



# *Energy Reduction process cont.*

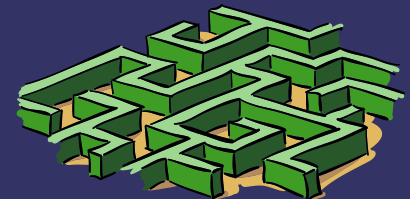
- ➔ Although the returned 80°F water is slightly warmer than our beginning temperature, this water is of high value in cooling down steps of our process. This water used in conjunction with small amount of fresh water will make an effective coolant.





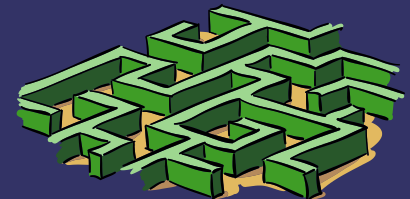
# *Water usage reduction.*

- ➔ By creating a closed system of pipes, pumps, turbines, cooling coils, and storage tanks, we will be able to reduce our water usage to nearly zero. The only additional water that may be needed would be the water used to reduce the temperature of the re-used water further, to a usable temperature.



# *Potential Benefits*

- Reduced fresh water usage, and also, reduced waste water disposal.
- Reduced outside energy costs.
  - By utilizing turbines, we will reduce our carbon footprint, by requiring less outside electricity, usually produced through the burning of fossil fuels, which releases massive amount of CO<sub>2</sub> into the air.
- Increased revenue through the benefits of becoming a more environmentally friendly company.



# *Potential Costs*

- ➔ Potentially high start up costs
  - The capital required to build, install and maintain these facilities will be large. We will need to plan this cost accordingly and spread it out over a length of time. However, the additional revenue that we will receive based on our newly found environmentally friendly process's will overshadow the capital costs in a few short, and profit boosting years.

