

# ACME Case Presentation

Alexane Rodrigue  
Chemistry 321



# Project Overview

- Desalinate waste water for re-use
- Goal is to purify 39,000 gallons of waste per month
- Use energy sustainably to decrease our carbon footprint





# Issues and Resolutions

- Desalination is energy costly and inefficient
- New technologies increase efficiency
  - Can desalinate up to 99% of salt out of water
  - Nanofilters reduce energy costs
- Sustainable sources of energy are useful
  - Photovoltaic cells
  - Microbial fuel cells
  - Wind turbines



## Current Status

- Waste Disposal costs \$1.65 M annually
  - 185 tonnes of waste disposed in ocean monthly
  - 74,000\$ per month for this waste
- Could re-use up to 169 m<sup>3</sup>/month of water
- Drastically lower carbon footprint
  - Reduce overall energy costs
  - Reduce wastes disposed into ocean
  - Reduces externalities

# Looking Ahead

- Waste water charges are 159% of water supplied
- Water rates are due to increase by 3.2%
- Re-use water is our best option
- Desalinated water can be used for any step in our industry

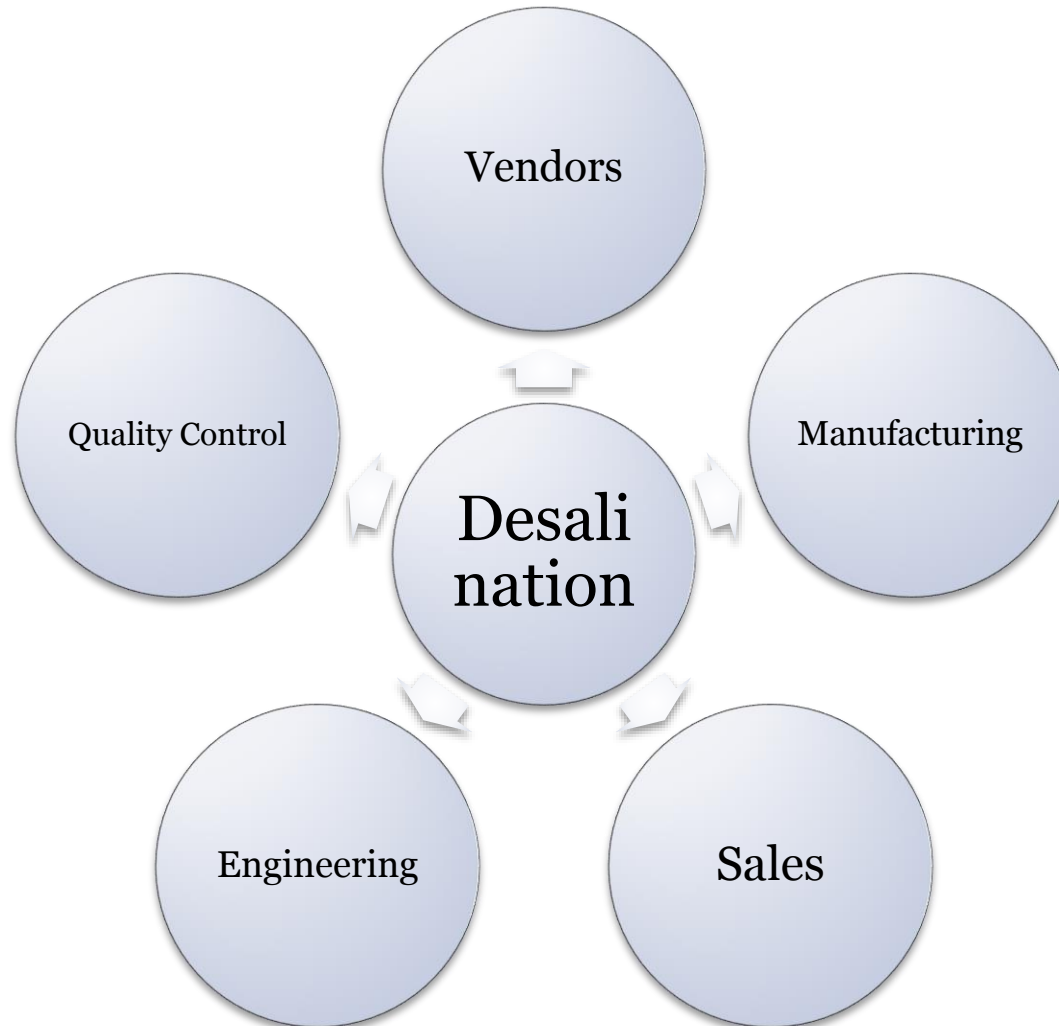




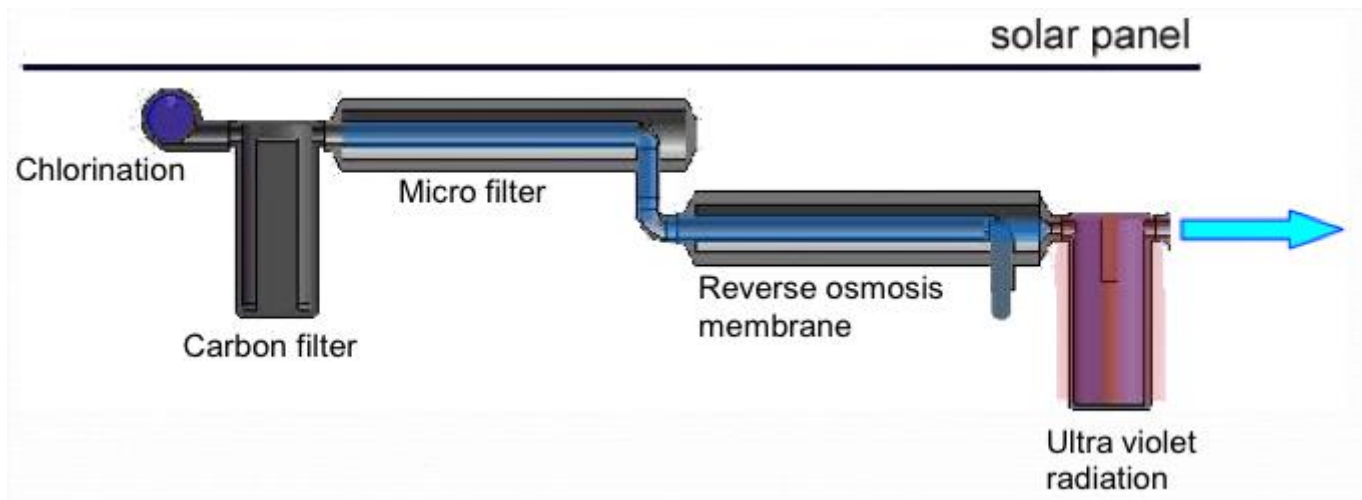
# Why choose solar powered water purification techniques

- PV cell efficiency is increasing
- Increased efficiency lowers energy costs
- Self-sufficient models eliminate need to hire plant manager
- Help us become ISO 14001 certified

# Multiple Factors



# The model







# Overview

- Carbon Filtration
- Microfiltration
- Reverse Osmosis



# Cost

- Pumps and carbon filter can be added to our facilities
  - \$100k-200k
  - \$8.10 per 1000 gallon in total water cost (million gallons per day facility)
- PV cells and reflectors would cut energy costs
  - We deal with only 1500 gallons per day
  - Lowers cost dramatically
  - Require less energy
  - Requires less water pressure



# Summary

- Desalination and carbon filters could clean 185 tonnes of waste monthly
- Photovoltaic reverse osmosis units are self-sufficient
- Could derive all energy needs from renewable sources
- Save up to \$888, 000 spent annually on ocean disposal
- Lower carbon footprint
- Help us become ISO 14001 certified

# Thank You

Questions?

