

Project Overview

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Major: Environmental Engineering

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Summer Activities

During the course of this summer, I joined NIAC as an analyst student and learned basic concepts of pollution prevention in a two-week class and a practice assessment in a local facility. Afterwards I participated in the assessment of three facilities located in Nebraska and neighboring state, Minnesota.

Recommendations Description

During each assessment visit, each analyst is assigned to prepare an assessment recommendation (AR) considering Pollution Prevention (P2) Energy Efficiency (E2) measures. Consequently, I worked on preparation of three ARs for the visited facilities. The finalized ARs are listed below:

- The automation of suction pressure control in ammonia compressors
- Replacing the reciprocating ammonia compressors with screw compressors
- Installing PLCs on the plating line control systems

Pollution Prevention Benefits

All three recommendations can lead to improved energy efficiency. This can indirectly help pollution prevention by reducing the overall consumption of energy and related emissions from the production of electricity and using natural gas, like GHG emissions. The amount of energy saving and reduced GHG emissions are shown in Table 1.

Results

The table below summarizes the pollution prevention benefits:

Table 1: Summary of Pollution Prevention Benefits

AR	Annual Energy Savings	Annual Cost Savings	GHG Emission Reduction (MTCO ₂ E/year)
Automating the Suction Pressure Control in Ammonia Refrigeration System	674,431 kWh/year	\$48,136/year	478
Removing Reciprocating Ammonia Compressors	944,171 kWh/year	\$99,274/year	669
Installing PLC on Plating Lines Control System	TBD	TBD	TBD
Total	1,618,602 kWh/year	\$147,410/year	1147 MTCO₂E/year