COMPRESSED AIR LEAK MANAGEMENT PILOT PROJECT

Iowa Waste Reduction Center

University of Northern Iowa
Business & Community Services

In 2014, the Iowa Waste Reduction Center conducted a pilot project to determine cost and energy waste as a result of compressed air leaks at 25 Iowa small businesses.

IWRC environmental specialists visited businesses using ultrasonic leak detection equipment to identify leaks and quantify leak rates. During each site visit, information was also collected on the facility's electrical costs per kilowatt hour (kWh), compressor operation and compressed air line pressure.

Using this data, an estimate was calculated on potential cost savings, energy usage reductions and consequently air emission reductions that might be realized by these businesses when fixing the leaks. Each business that participated in the project was provided a copy of the cost savings and energy reductions report generated for their facility.

At A Glance

- Six month pilot project
- Funded by grant from the Iowa Economic Development Authority
- Resulted in creation of online resources available at iwrc.uni.edu/services/compressed-air
- Conducted 25 audits at Iowa small businesses
  - Body Shop - 13
  - Vehicle Service/Body Shop - 3
  - Ag Equip Manufacturer - 2
  - Structural Steel Fabrication - 2
  - Manufacturer - 4
  - RV Sales & Service - 1

Results

Leaks were identified at all 25 participating businesses. Outcomes showed a range of results depending on type and size of the business. While one small body shop had only one leak, 47 leaks were identified at a structural steel fabricator.
For the businesses involved, the most valuable outcome to this project is cost savings. Over 87% of the businesses plan to implement a leak detection program, and 76% plan to fix a majority of the identified leaks.

Potential Cost Savings

Total annual savings for all 25 businesses - $49,748

Average annual savings - $1,990

- Three-employee body shop - $60
- Agricultural equipment manufacturer - $11,500

Potential Energy Savings

Total annual savings for all 25 businesses - 607,815 kWh/year

Potential Air Emission Reductions

Total annual reductions for all 25 businesses

- 600 tons/year of CO_2
- 0.9 tons/year of NO_x
- 1.75 tons/year of SO_2

By extrapolating the results of the Compressed Air Leak Management Pilot Project, the table below shows the cost savings, energy reduction and consequent air emissions reductions that could be achieved by only these 25 businesses.

Potential Future Savings

	Total Energy Avoidance (kWh/yr)	Estimated Cost Savings	CO_2 (lbs/yr)	NO_x (lbs/yr)	SO_2 (lbs/yr)
1st Year	607,851	$49,745	1,189,433	1,788	3,528
5th Year	3,039,255	$248,740	5,947,165	8,940	17,640
10th Year	6,078,510	$497,480	11,894,330	17,880	35,280

Businesses participating in the audits were sent a follow-up survey to gauge the effectiveness of the pilot project. All of the respondents found the project to be beneficial. Here is what some of them had to say.

The audit was impressive. I knew I had leaks in my plant but didn't know where they were. This audit was very helpful to find out where the leaks were to repair and save energy. Thanks again!

This has been an eye opener. Day to day the problem almost becomes unnoticed as it becomes worse, utility cost rocket higher. The program examines and shows the problems and what the cost of waste is. **This is very beneficial to the bottom line.** Thank you IWRC.

They found leaks that I would never have found. New fixtures had leaks that will be repaired soon. The major ones have been repaired and the cost was cheap. I would never have been able to put a dollar amount the cost of lost air via the cost of extra electricity. It is a eye opener for sure.

After the audit, one sees the problems and hears the problems and the costs, then what can be done to save and lower utility bills. **It brings you to a real understanding for the need of scheduled maintenance program**. Thank you for doing the air audit at my facility.

I considered this **a valuable test to save money.**

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UNI University of Northern Iowa Business & Community Services

Results

Twenty-five Iowa small businesses participated in the pilot project in 2014. IWRC environmental specialists conducted audits at each business to identify leaks and collect information in order to determine cost and energy savings from fixing air leaks.

Business Description	Number of Leaks	Total Energy Avoidance (kWh/yr)	Estimated Cost Savings	CO_2 (lbs/yr)	NOx (lbs/yr)	SO_2 (lbs/yr)	Total CFM Loss
Body Shop	1	585	$60.52	1,150	2	4	1.4
RV Sales & Service	2	9,888	$961.06	19,446	31	63	7
Body Shop	4	1,875	$182.10	3,688	6	12	5.7
Vehicle Service/Body Shop	4	8,724	$785.24	17,160	27	56	9.2
Structural Steel Fabrication	4	3406	$310.37	6,701	11	22	7.1
Body Shop	6	7,372	$589.86	14,502	23	47	16
Body Shop	7	9,754	$747.25	19,184	30	62	19
Body Shop	7	7,282	$532.54	14,322	23	47	14.5
Body Shop	8	9,822	$785.76	11,840	26	94	17.4
Body Shop	8	6,183	$444.08	12,164	19	40	15.4
Body Shop	8	6,684	$669.15	13,147	21	43	13.3
Body Shop	8	7,830	$494.03	15,399	24	50	15.9
Body Shop	9	12,689	$1,112.41	24,958	39	81	20.6
Body Shop	13	13,223	$978.36	26,003	41	85	21.5
Manufacturer	15	24,404	$2,928.29	47,994	76	152	27.2
Body Shop	16	22,222	$2,006.42	43,701	69	142	40.6
Manufacturer	18	39,902	$4,788.17	78,477	124	255	61.3
Vehicle Service/Body Shop	19	25,249	$2,272.38	49,658	78	162	46.9
Body Shop	19	31,168	$2,055.45	61,298	97	199	55.2
Vehicle Service/Body Shop	20	32,059	$2,792.58	63,051	99	205	45.3
Manufacturer	20	33,981	$3,058.23	66,832	10	217	69.7
Manufacturer	26	46,315	$4,168.48	91,094	144	296	66.8
Ag Equipment Manufacturer	29	46,566	$2,845.03	91,580	144	298	82.5
Ag Equipment Manufacturer	29	133,226	$11,590.72	262,026	413	852	112.5
Structural Steel Fabrication	47	67,442	$2,590.14	134,058	211	43.6	139.8
Total	**347**	**607,851**	**$49,748.62**	**1,189,433**	**1,788**	**3,528**	**931.8**

The Compressed Air Leak Management Pilot Project was funded by a grant from the Iowa Economic Development Authority. For more information, visit iwrc.uni.edu.