



Ernie's Energy Saving Tips Electric vs Pneumatic

INCREASE energy efficiency, **SAVE MONEY!**



THINGS TO CONSIDER

Pneumatic tools are a regular part of many operations. However, when used intermittently, they may be a hidden source of wasted energy. Compressed air management has become an industry of its own. There are compressed air training courses available and professional air management service providers. Here are some basics to consider:

- ➔ **Air compressors are expensive to purchase and to use.**
- ➔ **"Right-sizing" is an important part of management. Air compressors use energy to generate pressure that frequently goes unused.**
- ➔ **Downsizing the compressor to the job at hand can save money. A compressor running at part load is generally less efficient than when it is running at full load.¹**

CHOOSE RIGHT TOOL FOR THE JOB

Electric vs Pneumatic? If a pneumatic tool is used infrequently yet the compressor runs continually, replacing the tool with an electric hand tool could reduce your cost through energy conservation. Stanley Tools developed a report and cost savings case study that indicates **an electric tool can provide substantial savings.³**

How do you decide? Many factors affect the total Life Cycle Costs of both pneumatic and electric tools. Here's an example that calculates the potential annual energy savings of using an electric tool in place of a pneumatic tool.

- ➔ **Pneumatic:** the example assumes that the pneumatic tool is used to fully tighten or loosen a fastener and that the air compressor continues to run even when the tool is not in use. Additional cost is added for the leaks that occur in a compressed air system. The calculation predicts the kilowatt hours used by an air compressor to run a pneumatic fastener tool. The cost can be calculated using a base rate of \$0.06/ kilowatt-hour (about \$213.48 annually for daily use).
- ➔ **Electric:** The average electricity usage of an electric hand tool can be calculated for the fastening action as a "free-run" period that uses about 10% of the tool's rated capacity and for the actual tightening action that uses about half the capacity. The sum of these two power usages is then multiplied by the same base rate of \$0.06/kilowatt-hour to determine the cost of operating an electric hand tool to tighten or loosen a bolt (about \$80.58 annually for daily use).

Annual cost savings for choosing electric tool
\$213.48 - \$80.58 = \$132.90



**See
reverse
for more
savings**



**The Visible Cost of Air:
A Worksheet to Assist in Identifying
Compressed Air Saving Opportunities**

- ➔ It's a tool to identify cost saving opportunities in air management at a facility.
- ➔ Download at http://www.istc.illinois.edu/info/library_docs/TN/tn07-087.pdf.²
- ➔ Provided by Illinois Sustainable Technology Center (ISTC)



Choosing electric vs pneumatic reduces CO₂ emissions

Green House Gas (GHG) gets a lot of press lately. GHGs drive climate change by creating a greenhouse effect when the sun's rays are trapped within the Earth's atmosphere. Most electricity is produced in coal-fired power plants in the U.S. This combustion process generates carbon dioxide (CO₂) emissions. CO₂ is a greenhouse gas.

From the cost savings calculations, the example pneumatic tool would use 3558 kilowatt-hours annually. The example electric tool would use 1343 kilowatt-hours for the same application. So the potential annual savings would be:

$$3558 - 1343 = 2,215 \text{ Kwh savings per year}$$

Calculate the potential annual CO₂ emissions reduction using known values as follows:
 $2,215 \text{ Kwh} \times 681 \text{g of CO}_2/\text{Kwh} \times 0.002205 \text{ lb/gram} \div 2,000 \text{ lbs/ton} = 1.663 \text{ tons of CO}_2 \text{ reduction per year}$

These figures can vary widely for different countries and will depend on the local source of electricity. But it is clear that electric tool can **provide a source for energy savings and a source for the reduction of CO₂ emissions into the environment.**³

Green House Gas (GHG) potential savings

**3558 – 1343 = 2,215 Kwh savings per year=
1.663 tons of CO² reduction per year**



credits

The content for this handout is made available for you courtesy of Sue Schauls Consulting (www.sueschauls.com) based out of Waterloo, IA

FOOTNOTES

1 <http://www.compressedairchallenge.org/> sponsored in part by the Iowa Energy center.

2 http://www.istc.illinois.edu/info/library_docs/TN/tn07-087.pdf.

3 <http://www.stanleyassembly.com/documents/en/White%20Paper%20on%20Energy%20Consumption.pdf>