

Energy in Your Shop: It's More Than Just Utilities

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The existing power plant carbon emissions rule is said to only raise your electricity bill by 6 to 12 percent, according to the EPA. Energy bills are only 2.5 to 3.0 percent of sales in our industry. So, what's the big deal?

A typical precision machining shop pays from 2.5 to 3.0 percent of their sales revenue for utilities. If we go with \$12,000,000 in sales for this shop, its annual utility bill might be around \$360,000. According to the U.S. EPA's own data, the expected increase in electrical rates ranges from 6 to 12 percent because of this rule. But that is only as a result of the rule. What are the typical market increases that we have seen from year to year in electricity? Our members report that they see their utility rates increase from 7 to 10 percent each year because of market forces. Using EPA's own data and actual market price increase experience, the typical shop we are discussing is now looking at a 13- to 22-percent increase in their direct electricity. Energy bills that first year could range, using these figures, from 2.83 to 3.66 percent of the shop's sales. That typical \$12,000,000 in shop sales could now be looking at an annual electric bill of \$439,000.

This 22-percent increase in the shop's electric bill will likely be seen as a minor issue not really affecting our competitiveness in the market. However, the energy that is in our products is more than that spent by us in our process. It is built into the materials that we machine. While our raw materials are sold on a price-per-pound basis, in reality, they can also be seen as a store of the energy used to produce them into a useable form. Production of iron equates to roughly 3,600 kWh per ton, while aluminum requires 55,000 kWh to produce a ton of metal. Magnesium, frequently heralded as a significant opportunity for "light weighting," requires 91,000 kWh to produce a ton. Titanium, used in aerospace applications as well as medical orthopedic parts, takes 126,300 kWh per ton. By these measures, copper seems like a bargain at only 13,530 kWh per ton.

With the energy content so high in our raw materials, the real impact of the EPA power plant carbon emissions rule will be on the cost increases that our shops, and our customers, will have to pay for the more expensive raw materials. Raw material costs range on average from 25 percent of our final sales price to as much as 37 percent of sales for products machined from exotic materials. That shop with \$12,000,000 in sales has a \$4,440,000 raw material bill prior to the new rule.

After the rule, they'll be paying based on the 37 percent costs of materials and an additional 22 percent of electricity increases used to make those products. (Actually, the mills may find that their electricity increases go up by a much larger factor.)

By adjusting the raw materials cost to account for the increase in electricity at the 22-percent rate as we described previously, the new proportion of sales dollars that will be needed to cover the cost of raw materials under the new emission rules jumps from 37 percent to 45.14 percent. The cost of raw materials for that \$12,000,000 shop is now \$5,416,800.

The difference from our current cost of raw materials (\$5,416,800 minus \$4,440,000) is \$976,800. The increase in our cost of direct utilities is \$79,000. The total of the increased costs of this rule on our shop is \$1,055,800. This is the direct regulatory cost resulting from this rule. This is an 8.8-percent increase in total costs, resulting from the 22-percent increase in utilities and raw materials used by the shop. It is a far cry from the 6 to 12 percent of the electricity bill, claimed by the EPA.

"Your mileage may vary." I never heard that phrase until the EPA became a significant part of our life. "Your prices are too high. How can you justify an 8.8-percent increase on your turned parts?" We will be hearing this in our shops, as a result of this new EPA rule.

*Note about the calculations: We used the 22-percent figure based on the EPA's maximum estimate of 12 percent and our member's experience with 10-percent market rate increases. This is likely an understatement when applied to the raw material suppliers, as it does not account for the differing proportions of power used to make the different metals.

