

Energy Use: The Critical Ingredient in Manufacturing Success

BY LUIGI DE BERNARDINI | MON JAN 20 2014



In Italy, we make a lot of pasta. A typical pasta recipe might require 500 kilograms of flour, 300 liters of water, 5 kilograms of salt and electricity as required. It's a simple process with few ingredients, is easy to control, and has a predictable yield. In spite of this, if you ask pasta producers for the direct industrial cost of a kilogram of pasta (excluding depreciation and overhead cost), only a few will be able to give you a definitive answer.

The problem is the "as required" part in the determination of the amount of energy required by the production. I used electricity in this example, but it could be steam, compressed air, cooling water, etc. This is important because the pasta, like many other things, is a product with a very low added value, meaning the margins are extremely small. Therefore, cost control is critical.

Nevertheless, most companies allocate energy costs on a product in retrospect, basing the allocation on some algorithm or percentage of measurements made during the installation of the machines. This is done with a very gross level of approximation, despite values that affect the total cost of production by several tens of percentage points, and are therefore critical to the profitability of the company.

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Today, the amount of energy needed to produce a certain good deserves to be treated as any other ingredient or component. Energy use should be included in the processes of planning, procurement and financial statements just as any other item needed for production.

The energy intensity (the amount of energy required per unit of output) can be considered in the planning stages of production to determine the lines or equipment on which the production process is most efficient, as well as the time slots when the incidence of energy cost is less. The schedule can then redeploy production plans considering energy as a constraint, thus ensuring significant savings. The production plan can then be used to determine the need for energy like any other raw material. The supply can be negotiated based on the actual needs with better ability to access affordable rates and greater ability to negotiate. The effect is further amplified in the presence of cogeneration systems or self-generation that can partly meet the energy needs of the business.

During final accounting, the knowledge of energy intensity required for the product is crucial for the calculation of its actual cost. Having this knowledge can affect the decision to make or buy or the determination of the market price.

The data utilization of various raw materials correlated with those of energy use can also open the door to analysis and evaluation on the efficiency of those materials; it can even allow for the comparison of materials purchased by some suppliers versus others, which may still trigger further savings and improved efficiency.

As you can guess from this quick analysis, there are numerous reasons why energy today deserves to be

considered a raw material like any other component of a recipe or a bill of materials, and therefore handled with the same care and with appropriate tools. I dare say that an appropriate energy management plan today should be considered essential to any manufacturing company that wants to stay in the market in an efficient and competitive way.

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