The Oven Is Idle. The Meter Is Not.



I run a small factory that builds control boards. Last year I spent a good part of the summer looking at our electricity bill, trying to find where the money went. It went into the reflow oven, but not in t he way I expected.

The oven was not running. It was waiting.

That distinction cost us more than I want to admit. When an oven warms up, the chamber, the heat ers, the air system, the conveyor and the exhaust all have to reach working temperature. That takes energy, and it is unavoidable. Once the oven is hot, keeping it hot is a different matter. It loses heat t hrough the exhaust and the insulation, and it loses more every time a cold board goes in. If the line stops while a feeder is cleared, or while an engineer checks a changeover, the oven still burns power to hold temperature. Nothing is being made. The meter does not care.

Two factories can own the same oven and pay very different amounts for it. One runs two shifts wit hout stopping. The other starts, waits, stops, changes product and starts again. The second factory c an spend more per finished board, even though nothing about the machine has changed. I know, be cause for a while we were the second factory.

We started writing down five things. How many times we started the oven each day. How long it sat

hot before the first good board. How often the line paused. Whether the standby settings were actually being used. Whether production kept the oven loaded once it was hot. The answers were not flattering.

What changed my mind was a simple change of measure. I stopped asking about rated power. Rated power is a maximum, a number for the electrical supply, not a number for my costs. I started asking how much energy we used per acceptable board. That is the figure that belongs in a factory. A line can look efficient during a ten-minute run and still be expensive across a full shift, because the waiting is where the money leaks.

This is the part of reflow oven energy consumption that suppliers do not always explain, and buyers do not always ask about. Insulation matters. Exhaust settings matter. Nitrogen use matters. The operating temperature matters. All of them matter less than the schedule, because the schedule decides how often you pay to get hot and how long you stay hot for nothing. I found a clear explanation of energy per good board in a reflow oven capacity guide, and it gave our engineering team a shared language for the argument.

Capacity belongs in the same conversation. A line that makes more boards per hour can still waste energy if it has long hot standby periods, repeated restarts, too much exhaust or poor insulation. We began to treat output and energy as one question, not two departments. The purchasing team stopped looking only at the price of the machine. The production team stopped looking only at boards per hour. We looked at cost per good board, and that is a number both can live with.

A note on the human side. Last April an I.C.T engineer came to Portugal to install a full SMT line for automotive electronics — car lighting and control systems. The customer later spoke about smooth setup and clear guidance during training. I mention it because the way a line is handed over affects how well it is run. An operator who understands standby settings will use them. One who does not will leave the oven hot through every break. Training is not a courtesy. It is part of the energy bill.

If you are choosing an oven, ask about the profile, the board mix and your own daily schedule, in that order. The machine is only half the story. The other half is what happens between the jobs.