FOODSERVICE EQUIPMENT reports

WHAT IT REALLY COSTS

Purchase price is just the beginning. Lifecycle cost projections give you a fuller picture.

By Mike Sherer

Yes, you have capital budgets and operating budgets. And yes, you have to track them separately. But they're not unrelated. What you spend on the capital side has profound implications for the operating side. You know it, and everybody in your office knows it. In the end, they're two pockets on the same pants.

And still you beat on "first cost," intent on the sanctity of the capital budget, often while pushing up operating expenses for years to come.

Fortunately, a growing number of you now are saying *enough*. As business growth gets harder to come by, you're looking for ways to cut costs and get more productivity out of the kitchen. And then the epiphany hits: As you revamp and replace kitchens, more of you are chucking the conventional viewpoint and trying to figure out what equipment really costs to operate over its useful life. Take that figure, annualize it, and you've got a yardstick.

The buzz now is "lifecycle costing," a discovery that's really a *re*discovery. In foodservice, the late industry guru Lendal Kotschevar, PhD., formalized the concept decades ago in textbooks like "Foodservice Planning: Layout, Design and Equipment."

All Things Considered

Ask yourself what you look for in a piece of equipment, and you'll probably say, in this order, performance, durability and quality. Typically, buyers weigh performance against purchase price when deciding among several suppliers, then take into account intangibles such as durability and quality.

Pictured: Kathy Alcozer, general manager at the Denny's in Oakbrook Terrace, Ill. Photo by Eric Futran.

Lifecycle costing gives you another way of comparing equipment—or the cost to own it—in addition to performance. The idea is to turn intangibles into tangible costs and forecast them over the life of the equipment. By doing so, you can find out if a unit with a higher initial purchase price has the same, higher or lower lifecycle costs as another, lower-priced unit.

First is the performance spec, and that goes without saying. No sense saving money on an item that won't do what you need it to. (Not that you've ever fallen into that trap, right?)

Durability is perhaps the next variable to consider. The life expectancy of the

SAMPLE COST MODEL (ILLUSTRATION ONLY) : CONVECTION OVENS

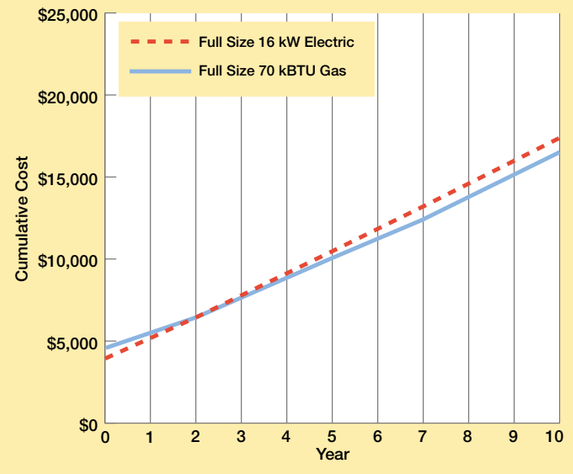
Full Size 16 kW Electric	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Totals
Purchase Price	3,500											$3,500
Installation	250											$ 250
Maintenance		165	179	193	209	226	245	265	286	309	335	$2,412
Energy		1,130	1,131	1,133	1,135	1,137	1,139	1,141	1,143	1,145	1,146	$11,380
Total Value	3,750	1,295	1,310	1,326	1,344	1,363	1,384	1,406	1,429	1,454	1,481	$17,542
Total Present Value	3,750	1,257	1,235	1,214	1,194	1,176	1,159	1,143	1,128	1,114	1,102	$15,472
Full Size 70 kBTU Gas												
Purchase Price	4,000											$4,000
Installation	300											$ 300
Maintenance		339	366	396	428	463	501	542	586	634	685	$4,940
Energy		708	720	731	742	754	766	778	790	803	815	$7,607
Total Value	4,300	1,047	1,086	1,127	1,170	1,217	1,267	1,320	1,376	1,437	1,500	$16,847
Total Present Value	4,300	1,016	1,023	1,031	1,040	1,050	1,061	1,073	1,086	1,101	1,117	$14,899

Operation	
Store Volume (lbs./day)	100
Oven Load Type	Potato Product
Operating time per day (hrs.)	10
Days of Operation per Year	365
Region	East North Central

Oven	
Number of Ovens	1
Start-ups per day	1
Coincidence factor (%)	65

Rates	
Electric ($/kWh)	0.083
Demand Charge ($/kW)	3.0
Gas ($/therm)	0.600
Discount Rate (%)	3.0

SAMPLE: OVEN 10-YEAR LIFE CYCLE COSTS



piece of equipment itself can be a big factor in a purchase decision. A low-priced piece of equipment may not be worth the initial savings if it lasts only half or two-thirds as long as a higher-priced competing model.

Now, when the disparity is that pronounced, you'll probably notice and think about it. But what if you're comparing two head-on competitors, with maybe only a couple hundred dollars between them? And what if one will last, say, five years, and the other will last six? Are you thinking about it? You should be, but it'd be easy to miss. And keep in mind we haven't even considered other kinds of costs yet.

Conversely, if you're looking at two pieces that both meet your performance needs, it might be harder to justify paying a premium for the higher-performance unit if it doesn't last as long as one with a little less power or production capacity.

Durability is probably the next biggie. How durable equipment is often depends largely on the environment in which it's used.

"We know on average our equipment lasts from seven to 10 years," says one fryer manufacturer. "Some folks put one in a concession booth and with a little maintenance they'll use it forever. The 24-hour McDonald's in Moscow, though, is a real torture test."

Energy usage is the biggest single component of lifecycle cost projections. Third-party data, gathered during a standardized ASTM test, help. Here, three-pan steamers are put through their paces.

The Happy Hook-Up

In many cases, using a piece of new equipment is as easy as uncrating it and plugging it in. More often than not, however, hooking up equipment is a little more complicated. Even if all you have to do is plug it in, you have to make sure you've spec'd the right plug set and a unit that conforms to the service, electric or gas, coming into your facilities.

A couple of cases where installation costs can become a big factor in lifecycle cost comparisons are ice machines and steamers. Ice machines, for example, can be self-contained or installed with remote components. Installation cost of the latter system is more expensive, but may extend useful life and/or reduce maintenance costs, resulting in a lower lifecycle cost depending on your type of operation.

Standard boiler-fired steamers also have a high installation cost because of water hook-ups and drainage requirements. They provide high productivity, but will have a higher lifecycle cost than connectionless steamers, which require no hookups and vastly reduce water consumption. Not that one's better than the other. But you need to double-check your assumptions about how much steaming you need, and which models and types will meet your performance requirement.

Keep installation costs in mind even when considering the costs of gas versus electric equipment. Again, utility service you already have in your facilities will be a primary factor in installation costs.

Energy Tops Your List

Except for really bizarre situations, the biggest component of a piece of equipment's lifecycle cost will be energy, or energy plus water. Depending on the type of equipment, you may spend up to three times the initial cost of the unit on energy use in the first five years. Finding the most efficient unit within your performance specs, obviously, could potentially deliver significant savings. In other words, a lower lifecycle cost.

Estimating energy cost isn't easy. First you have to figure out how much energy a given piece of equipment will use in your specific circumstances, which is

STEAMER LIFECYCLE FACTORS

- Purchase price, tax, freight, start-up
- Installation cost (standard steamers, require water hook-up, drainage, etc.; connectionless don't)
- Energy cost (hours of use per day at average percentage of peak energy use)
- Water cost (much higher with standard boiler steamers)
- Sewer cost (ditto)
- Preventive maintenance
- labor (cleaning, de-liming)
- supplies (de-liming chemicals, etc.)
- Service/repairs (more likely with standard units)
- "Real estate" cost (connectionless steamer more mobile, allowing greater flexibility in kitchen layout and/or menu changes)
- Annualized costs—all expenses amortized across projected life expectancy

tricky enough. Then you have to figure out what the cost of energy is in any given market in which you operate.

"Rule-of-thumb energy cost calculators are often erroneous," says Don Fisher, of Fisher-Nickel Inc., operator of the Food Service Technology Center, San Ramon, Calif. "A 14 kW fryer, for example, will use the same amount of energy per day as a 20 kW fryer under the same circumstances, so it's a tricky calculation. And energy costs are so variable across the country."

When you buy a car, the EPA ratings for gas mileage make comparing different models easy. Foodservice equipment is all different. Some equipment uses gas, some electric. Different equipment is designed to do different things—chop, mix, slice, heat, cool, hold, etc. That means there is no equivalent "mpg" in foodservice yet.

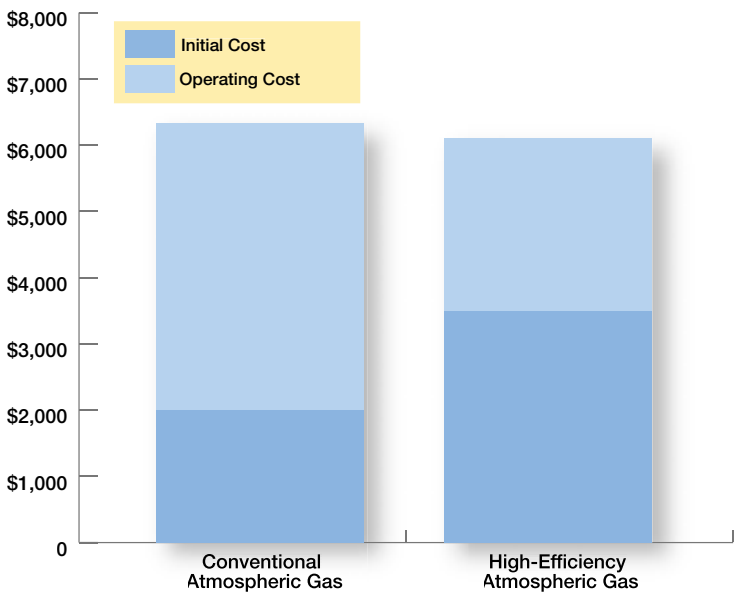
A fryer's energy cost, for example, is much more dependent on use than a reach-in refrigerator's. While a reach-in will cycle more often and use more energy when its door is opened frequently, average energy use over the course of a day is fairly simple to calculate. On the other hand, a fryer that's turned on for 12 hours per day may be idle for eight hours. When it is actually cooking food, some percentage of that work may be under heavy-load conditions, and some under medium-load and light-load conditions, all of which will impact the energy calculations.

For some categories of equipment, databases of energy use have been developed, making it easier to calculate energy costs. Stats for every ice machine on the market, for example, are listed on the Air-Conditioning and Refrigeration Institute Web site (*www.ari.org*), including daily production and energy and water use. Reach-in refrigerators, if they're sold in the state of California, are listed along with their energy data by the California Energy Commission (*www.energy.ca.gov*). The top 25% in terms of energy efficiency are now listed on the EPA's Energy Star Web site (*www.energystar.gov*).

Data on other equipment categories are coming together slowly. The FSTC now has energy use calculators based on ASTM test data for fryers, hot holding cabinets, and steamers. In addition, the folks there also have a standard energy use calculator that can be used for just about any piece of equipment if you have ASTM test data to plug in for that particular unit.

(Just bear in mind, as Fisher notes, that rules of thumb are only that, and the accuracy of cost calculators rises and falls with the accuracy of their defaults and other detail assumptions. Even the sample-cost grid on full-size ovens in this story is mainly for illustration—cost components are estimates only, and while we feel pretty good about the representative "average" energy rates, we're jumpy about the maintenance figures. Our advice is to build your projections from scratch, using actual historical

LIFECYCLE PAYBACK IN HIGH-EFFICIENCY 14" FRYERS (standardized to 5-yr. projection)



Note: Includes purchase price, energy @$0.60/therm and $200/yr. maint.
Source: Food Service Technology Center

DESIGNING A TEMPLATE

In an ideal world, as an equipment purchaser or specifier you'd have a handy-dandy lifecycle cost calculator in your hip pocket. Any time you looked at a new piece of equipment, you could plug in variables about how the equipment would be used and get an estimate of the cost to own it.

The North American Association of Food Equipment Manufacturers has started an effort toward making that dream a reality. NAFEM's Customer Advisory Task Force, which meets quarterly, has been working on the subject of lifecycle costing for some time. A draft template was submitted for review at the March meeting and will be discussed again this month. The project then may go to the engineers on NAFEM's Technical Liaison Committee, who would begin developing some standards for lifecycle costing.

"It's a much larger issue than NAFEM alone," says Charlie Souhrada, NAFEM director of member services. "Ultimately, it might involve service agents, consultants and equipment dealers."

The fact that NAFEM is addressing the issue is a step in the right direction.—*MS*

data and specific regional rates whenever you can.)

A sophisticated lifecycle energy-cost projection might even project future cost fluctuations in gas or electricity over the life expectancy of a piece of equipment. But even more basic is a look at the price of gas and electricity in the markets where you operate. While equipment fueled by one type of energy may be more efficient than another, the cost of that energy may be higher in some markets, giving the equipment a higher lifecycle cost in that market.

Finally, don't forget that installation of many types of equipment, cooking equipment in particular, can affect the load on your HVAC system. That, in turn, can affect your energy costs. The main thing, though, is that your comparisons remain valid, so whatever you calculate, be consistent.

Water, Water Everywhere

Next up is a cost sometimes overlooked. Several categories of equipment use water, and water is a utility you not only pay for on its way in, but one you also have to pay to get rid of.

In the April issue, for example, we told you about how much water—and energy—you can save by using low-flow prerinse spray valves. The savings in water result from the cost of water used and also the sewer costs related to water that goes down the drain.

Other categories of equipment that use a lot of water include dish machines and ice machines as well as steamers. ARI data on ice machines include water usage (most of which ends up as ice, but some of which ends up going down the drain). Remember, though, to factor your actual usage when you calculate costs. You may have a 1,200-lb. machine, but use only 1,000 lbs. per day.

Dish machine water usage also depends upon actual use. Working with the manufacturer and your own internal traffic numbers, you may be able to calculate average daily use based on how many loads a machine will wash in a day.

Cleaning & Consumables

Preventive maintenance can play a big role in lifecycle costing. Proper maintenance can extend the life expectancy of equipment and prevent expensive service calls. But maintenance also may be more costly on some types of equipment than on others.

FRYER LIFECYCLE FACTORS

- Purchase price, tax, freight, installation, start-up
- Energy
- Hours of use per day, calculating percentage of use at full load and at idle.
- Average energy use per hour (Btus or kW)
- Labor (e.g., dedicated employee vs. using basket lifts)
- Preventive maintenance (costs for labor and supplies to clean, filter oil, etc.)
- Shortening usage & disposal
- Service/repair costs
- Some types of units may have higher component repair/replace rates
- High-volume usage may "age" units faster
- Level of staff training may affect how much abuse equipment receives
- Additional energy costs (added load on HVAC)
- Annualized costs—all expenses amortized across projected life expectancy

Some types of equipment—like the oven being loaded for testing here—are relatively easy to build cost models for. Others involving consumables and complex load cycles can be a little tricky.

Almost a year ago, Burger King completed the system rollout of its Phase I kitchen. "It's been very successful in terms of helping units build sandwiches," says Jeff Cook, BK director of equipment development, "but we've found some increased labor costs. The old toaster we used just needed to be wiped down. The new one has to be broken down to be cleaned. The increased maintenance cost caught the franchisee community by surprise. Now we try to do a lifecycle cost analysis before we spec a new piece of equipment."

So labor costs—or more precisely, *differences* in labor costs—will matter in your decisions. A self-cleaning soft-serve machine might have a much higher initial cost than a standard machine, for example, but the labor cost to clean the standard machine probably results in a higher lifecycle cost. Cleaning and deliming a boiler-fired steamer adds a lifecycle cost not incurred by connectionless steamers. Training employees to properly clean and maintain equipment also adds to labor costs.

The cost of supplies in addition to labor should be factored into mainte-

ICEMAKER LIFECYCLE FACTORS

- Purchase price, tax, freight, start-up
- Installation (remote vs. self-contained)
- Energy (at projected use rates, e.g., 300 lbs./day actual use from a 400-lb. machine)
- Water
- Sewer cost (most machines use more than 12 gals. of water to produce 100 lbs. of ice)
- Preventive maintenance cost
- Supplies (filters, cleaning agents, de-liming chemicals)
- Labor (cleaning, changing filters, etc.)
- Service/repairs cost
- Footprint cost (e.g., by using remote, can you save space to devote to other equipment or more f-o-h space?)
- Annualized costs—all expenses amortized across projected life expectancy

nance costs. Filters for ice machines and fryers, fryer shortening, chemicals to clean and de-lime steamers or ice machines, and other supplies all figure into lifecycle cost.

Oops, It Broke

Though not as heavily weighted as energy, service and repairs also factor into lifecycle costing. When a piece of equipment breaks down, not only do you incur the cost of a service call and repairs, but also the lost time or income while the equipment is down.

Unlike the car business, unfortunately, there isn't a J.D. Power & Associates ranking for foodservice equipment. Estimating service costs is difficult when a piece of equipment is truly new, a model that's never been on the market before. And often, data on service history of equipment that's been out there for years are sketchy or non-existent. The factories can track warranty data, but otherwise things get murky. Commonality of parts confuses things. You change service agents, and your serial-number history starts over. The only reliable records are the ones you keep yourself.

"Service calls are something we figure on, but they're hard to predict," says Carol Davis, senior director of architecture and engineering at Denny's. "Manufacturers rarely can provide data beyond the warranty period, and not that many can tell us what service costs average for equipment that is under warranty."

There are ways to get at estimates, however. The first is to ask manufacturers for whatever hard or even anecdotal data they have. Next, ask service agents in markets where you have facilities what experience they've had with the piece of equipment you're costing. Finally, start keeping data on what your own units spend on service calls for different types of equipment.

"We know most manufacturers only track failures during the warranty period," says Burger King's Cook, "so we go to the component manufacturers for expected failure rates on components. We push manufacturers to get information from OEM suppliers that will be representative. I think we also will head in the direction of getting data from our own system."

Again, the thing to consider is whether a higher lifecycle cost due to increased service is outweighed by other factors. Some equipment may need expensive replacement parts more often, for example, but make up for it due to higher productivity or efficiency.

Odds And Ends

A few other variable to keep in mind when you're considering the true cost of equipment are labor to operate it and the "real estate" it occupies.

We've already mentioned that labor to maintain and clean equipment can add to costs. Labor to operate equipment can vary, too. For example, if you have a high-volume fry operation, you may weigh the costs of labor to monitor the fry baskets against the potential service costs of buying fryers with basket lifts.

Real estate is another cost that may not seem significant, but could add up if you're talking about a lot of stores. Equipment with a smaller footprint—ice machines with remote compressors, for example—can free up kitchen space or even enough space in the front of the house to add more seats. Equipment that is mobile gives you flexibility to make the kitchen more productive or the menu more profitable.

Go Figure

Admittedly, lifecycle costing is pretty new as trends go. But it's growing. "We are fairly new at it," says Cook, "but it's been a key focus of mine since I came on board two years ago."

Larger chains like Burger King and McDonald's have the means to research or develop the data needed to do more sophisticated lifecycle cost analysis. Burger King, for example, now requires manufacturers to do energy efficiency testing as part of its spec process, making it much easier to predict energy costs.

As with most new movements, credibility is one of the hurdles. "Right now we don't consider lifecycle cost that strongly among all the things on our list of priorities," Davis at Denny's says. "We'll take a higher operating cost to get better performance. But we would probably pay a lot of attention if someone came in with credible, certifiable third-party lifecycle cost data."

While some of the exercise may still consist of guesstimating, there are places to go for help. FSTC has compiled energy usage data on a wide variety of equipment through ASTM testing. And, as mentioned, it has a standard energy use calculator anyone can use for equipment that has been tested using ASTM.

The Gas Technology Institute (*www.gri.org*) has a program called "kitchenCOST" that helps determine lifecycle cost as well as how energy usage varies depending on the mix of equipment used in the kitchen.

More manufacturers also are getting a better handle on how long and how well their equipment lasts under different conditions. It won't be too long before purchasing equipment will be a lot more like buying a car. In the meantime, break out the calculator.