EPRI

CASE STUDY

Crisp, Clean, and Green: Maximize Flavor and Efficiency with Electric Fryers

THE CHALLENGE

Fried food has become a national favorite, and many full- and quick-service restaurant chains that serve french fries, fried fish, chicken fingers, and other popular fare have embraced electric fryers because they enable restaurant operators to improve operations, reduce costs, provide quality food to customers, and improve the employee experience.

Many industry operators prioritize cooking equipment reliability and employee productivity. While energy use is a consideration, it is a much smaller cost contributor (< 5% of operating costs) than labor and food costs.

While the preponderance of cooking equipment has traditionally been gas, foodservice operators are gravitating toward electric due to the industry's positive experiences over the last 10 to 15 years.

"I have to say one of the best things we have done is going to total electric with our cooking equipment. Over the last two years, we opened dozens of stores with all electric cooking."

~ Director of Operations at a major Southeastern chain

THE OLD WAY

Many foodservice operators using gas fryers keep them on low burn overnight contributing to a waste of fuel.

In addition, operators may use more shortening in gas fryers versus comparable electric fryers. An Alabama Power study over two weeks with a customer at a chain that relies heavily on fried product found that 36.5 cases of shortening were used in four double well gas fryers (115,000 Btu/fryer) compared to 32.5 cases with four electric fryers that are 17 kW each. This equals a difference of roughly two cases a week (or half a case per week for each fryer), with a cost of ~$32 per 40–50-pound case at the time. Oil prices have increased to about $60 per 50-pound case now to make oil savings even more compelling.

Upfront costs for gas fryers are generally higher than for electric because they are more complex and have more components. They require more expensive safety equipment and ventilation systems. In addition, gas fryers can produce heavy carbonization, making them more difficult to clean than electric fryers.

THE NEW WAY

Many restaurants have discovered the advantage of electric cooking, in particular with fryers. Case studies for fryers and other electric equipment can be found at Case Studies – Electric Foodservice Council (efcouncil.com).

RESULTS

Alabama Power conducted a study in 2013 during mild weather months (to eliminate the influence of HVAC) and found the benefits described below. As a result, several Alabama Power customers adopted electric cooking, both in new stores and when updating existing stores.

Energy and Cost Savings

Energy savings are dependent on store operation and climate zone. However, there are savings associated with less heat in the kitchen with electric cooking. These energy savings are not always as critical as other benefits for equipment and employee productivity.

Other Benefits

Cooler working environment: In the study, employees encountered (at face level over the fryers), 106°F (41°C) with gas fryers versus 96°F (35.5°C) for electric fryers. Workers experienced an overall drop in temperature on the cook line from 81°F (27°C) with gas fryers versus 77°F (25°C) with electric fryers.

Less maintenance: The Alabama Power study found fewer critical failures with electric fryers because the heating elements are in the oil rather than heating the bottom of the pot which causes it to contract and expand every time it is cooled and heated, leading to cracking. Plus, electric fryers have fewer parts to repair or replace. Maintenance is much easier as the elements typically swing out for cleaning which ensures maintenance is actually performed.

Higher quality and productivity: Upon dropping cold product into the fryer, recovery times for electric fryers are faster than for gas fryers, resulting in a consistently higher temperature. This has three benefits:

- Food quality is improved because the product cooks faster and has less time to absorb oil.
- There is an increase in production rate, translating to increased sales during rush periods.
- There is less overall oil loss incorporated into the food product.

BOTTOM LINE

Foodservice operators found these benefits with their use of electric fryers:

- **Kitchen temperatures:** Kitchens are much cooler due to less heat output from electric versus gas equipment, leading to happier employees.
- **Maintenance:** Electric fryers have fewer parts versus gas, leading to savings on repairs and maintenance (R&M). They don't experience heat-related cracked pots and are easier to clean due to less carbonization on the inside of the vat. Elements swing out for easier cleaning
- **Faster recovery:** They heat up more quickly, resulting in faster recovery between product cooks, which is critical during a rush.
- **Upfront costs:** The cost of electric fryers in most cases is more economical than gas fryers.

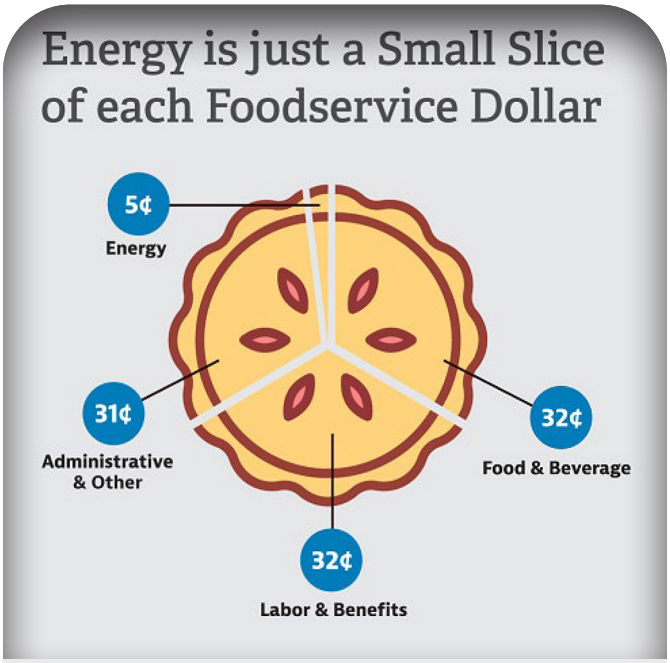

Figure 1. *Foodservice dollar cost breakout. Courtesy of Alabama Power Company.*

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About EPRI

Founded in 1972, EPRI is the world's preeminent independent, non-profit energy research and development organization, with offices around the world. EPRI's trusted experts collaborate with more than 450 companies in 45 countries, driving innovation to ensure the public has clean, safe, reliable, affordable, and equitable access to electricity across the globe. Together, we are shaping the future of energy.

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