

Customized Retrofit Incentive Report

Date: January 2013

Facility name: ABC Restaurant

Facility Address: 123 First St, Anywhere USA

Utility SA Id #: 123456789

Utility GAS Account Id #: 987654321

Contact name/phone #/e-mail address: John Smith / Owner / 123.456.0789 / Jim@abrestaurant.com

Summary of Customized Retrofit Project

This retrofit project entails the replacement of an industry standard, three foot wide, 120 kBtu/hr rated input underfired char-broiler with an energy efficient, two foot wide, 44 kBtu/hr rated input underfired char-broiler.

General Appliance Description – Underfired Charbroiler

Underfired broilers are commonly referred to as char-broilers and hearth broilers. They have the highest input rate and production capacity among broiler categories (with the possible exception of some conveyor broilers). They resemble the familiar barbecue, using a heat source below a sturdy metal grid to cook food with a combination of radiant heat, conduction and convection. Char-broilers are showy appliances that produce flames and smoke while cooking, and are often positioned in the kitchen so that these effects will be visible to patrons. The charbroiler marks food with distinctive striping, and the smoke that the broiler creates lends a particular flavor to food. They are widely used to prepare steaks, chops, hamburgers, chicken and fish.

In construction, underfired broilers share several common elements. Food is placed on a metal “grid”, a heavy-duty grill like that of a home barbecue. The grid commonly reaches temperatures of over 600°F (320°C) and conducts a significant amount of heat to the food. Below the grid, gas broilers have a set of atmospheric burners spaced every four to twelve inches along the width of the broiler. The flames are diffused by a bed of rock, ceramic briquettes, or a metal shield (“radiant”) just above the burners (Figures 1 and 2). This material between the flame and the food converts some of the flame’s energy to radiant heat. Electric char-broilers may have elements interwoven with the bars of the grid, or the elements may be sheathed inside the grid itself, in which case, heat transfer is almost entirely by conduction. As food cooks on an underfired broiler, drippings burn on hot elements, coals or radiants to create the char-broiler’s characteristic flame and smoke. Unincinerated drippings are collected in a grease tray.

(PG&E Food Service Technology Center report: Commercial Cooking Appliance Technology Assessment, 2002, FSTC report# 5011.02.26)



Figure 1 - Image of a typical underfired broiler

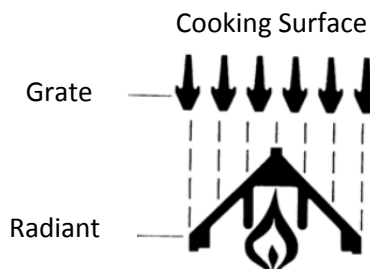


Figure 2 - Illustration of typical underfired broiler heat transfer to cooking surface

Resources

FSTC Contact: Todd Bell / 925.866.5478 / Tbell@fishnick.com

PG&E Representative Contact:

PG&E Food Service Rebates: www.Fishnick.com/rebates

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Existing Appliance Description

Make and Model: Industry Standard Char-Broiler

Rated Input (kBtu/hr): 40 kBtu/burner

Number of Burners: 3

General Appliance Type: Underfired char-boiler with industry-standard high-input atmospheric burners heating parallel metal shields (radiants) running the length of the cooking area. Heat radiates from these metal shields to the metal cooking grate or “grill” above to achieve operating temperatures of 600°F or more to cook the food product.



Existing Industry Standard Char-Broiler

Propose Retrofit Appliance Description

Make and Model: Vulcan-Hart VTEC25

Rated Input (kBtu/hr): 22 kBtu/burner

Number of Burners: 2

General Appliance Type: Underfired char-boiler with advanced design infrared burners heating a solid metal plate. The cooking grid sits directly on the metal plate, which optimizes the heat transfer from the burners to the food product while protecting the burners from debris.

The combination of high output infrared burners and the closer proximity of the burner and the cooking grate effectively transfers more heat to the cooking grate than a conventional underfired broiler design, thereby using significantly less energy to achieve the same operating temperatures.



The Vulcan VTEC25 Char-broiler

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Energy Savings Calculations

Description of Operation: The broiler is the workhorse of the ABC Restaurant kitchen and is operated at full rated input during the course of the entire service day. Kitchen staff turns the broiler on each morning at approximately 10 AM. The broiler is ready to cook by 10:30 AM and is used to mark chicken breasts with the telltale charred stripping. Customer service begins at 11 AM. Dinner service ends at 10 PM and the broiler is turned off shortly thereafter. It is used to cook a wide variety of menu items including chicken, sausage and steaks. The appliance is not turned off or down between the major service periods, lunch and dinner, as it must be ready to accommodate a customer order which can occur at any time during that period.

While the broiler has three burners to heat the three foot wide cooking surface, currently the far right burner is inoperable. Management has found that this cook zone is not necessary to meet menu demands, thus explaining the proposed specification of the smaller 25 inch wide Vulcan broiler. This condition is factored into the below energy saving calculations.

Operating assumptions

Days of Operation: 300

Hours of Operation per Day: 12

Operating Input/Control Setting: 100%

Energy Savings Calculation Methodology:

$$\frac{(\text{Existing unit's rated input X Hrs/op X Days/op})}{\text{One therm}} - \frac{(\text{New unit's rated input X hrs/op X days/op})}{\text{One therm}} = \text{Annual Energy Savings}$$

Where:

$$\frac{(80,000 \text{ Btu/hr X 12 hrs X 300 days})}{100,000 \text{ Btu}} - \frac{(44,000 \text{ Btu X 12 hrs X 300 days})}{100,000 \text{ Btu}} = \text{Annual Energy Savings}$$

Energy Use & Operating Cost Comparison

Appliance Make and Model	Est. Annual Energy Use (therms)	Est. Annual Energy Savings (therms)
Industry Standard Char-Broiler	2,880	-
Vulcan-Hart VTEC25	1,584	1,296

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Appliance Make and Model	Est. Annual Energy Savings (therms)	Incentive (\$)
Vulcan-Hart VTEC25	1,296	1,296

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