Equipment Budget Justification

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1. List the 4 convection ovens you have selected to compare (4 pt):

Gas Convection oven #1 Make & Model #	Blodgett DFG-200-K12-ES
Gas Convection oven #2 Make & Model #	Southbend SLGS/22CCH
Electric Convection oven #3 Make & Model #	Blodgett BDO-100-E
Electric Convection oven #4 Make & Model #	Southbend BES/19CCH

2. Complete the following table using the information obtained from the Fishnick Energy Savings Calculator. The baseline models' information is provided below. Attach calculations at the end of the assignment. (26 pts)

	Baseline Gas Model	Gas Conv. Oven #1	Gas Conv. Oven #2
Initial cost of oven	$3229.00	$3965.00	$4595.00
One-time rebate	N/A	$500	$500
Maintenance cost/yr	$150.00	$150.00	$150.00
Energy cost/yr	$1359.00	$800	$890.00
Lifetime maint. cost	$1800	$1800	$1800
Lifetime energy cost	$16308	$9600	$10680
Total lifetime cost:	$21337	$14865	$16575

	Baseline Electric Model	Electric Conv. Oven #3	Electric Conv. Oven #4
Initial cost of oven	$3392.00	$3795.00	$4165.00
One-time rebate	N/A	$350	$350
Maintenance cost/yr	$155.00	$155.00	$155.00
Energy cost/yr	$3093.00	$2699	$2637
Lifetime maint. cost	$1860	$1860	$1860
Lifetime energy cost	$37116	$32388	$31644
Total lifetime cost:	$42368	$37693	$37319

Discuss the initial purchase costs of each convection oven (all 6) vs. lifetime costs (12 pts):

Actual $ amount of equipment initial purchase comparison (3):
The initial purchase cost of gas convection oven #2 was the highest, followed by electric convection oven #4, then gas convection oven #1, electric convection oven #3, the baseline electric model, and finally the initial purchase cost of the baseline gas model was the lowest. The initial investments of baseline convection ovens are lower overall while energy saving ovens are more expensive. Generally, the more energy efficient ovens with higher initial costs show a lower energy cost per year as shown with the initially most expensive gas convection oven #2 with one of the lower energy costs per year.
Lifetime energy cost comparison; gas vs. electric (3):
The lifetime energy cost of the baseline electric model was the highest, followed by electric convection oven #3, then electric convection oven #4, the baseline gas model, gas convection oven #2, and finally the lifetime energy cost of gas convection oven #1 was the lowest. The lifetime energy costs of the electric ovens are all higher than all of the gas ovens overall giving gas ovens a lower energy cost per year.
Maintenance cost comparison (3):
The maintenance costs for electric ovens are higher than the maintenance costs for gas ovens. Electric models show a $5 increase in maintenance costs per year and a $60 increase in lifetime maintenance costs. For example, gas models are $150 per year with a $1800 lifetime maintenance cost, while electric models are $155 per year with a $1860 lifetime maintenance cost.
Total lifetime cost comparison (3):
The total lifetime cost of the baseline electric model was the highest, followed by electric convection oven #3, then electric convection oven #4, the baseline gas model, gas convection oven #2, and finally the total lifetime

cost of gas convection oven #1 was the lowest. Overall, gas ovens are generally less expensive than electric ovens due to the energy costs of gas being less costly than electricity.

3. Complete the following table using the information obtained from the "Qualified Convection Ovens" sheet. (8 pts)

	Gas Conv. Oven #1	Gas Conv. Oven #2
Cooking energy efficiency (%)	51%	48%
Production capacity (lb/hr)	97	96

	Electric Conv. Oven #3	Electric Conv. Oven #4
Cooking energy efficiency (%)	76%	75%
Production capacity (lb/hr)	99	102

Explain what efficiency means. Then **discuss** each convection oven's (the 4 you selected) performance in terms of efficiency and production capacity (8 pts):

Efficiency (%) comparison (4):

Efficiency is a measure of how much of the energy that an appliance consumes is actually delivered to the food product during the cooking process. A higher cooking energy efficiency percentage indicates that more of the energy consumed by the appliance actually goes into the food. Electric convection oven #4 showed the highest energy efficiency at 76%, followed by electric convection oven #4 at 75%, and then gas convention oven #1 at 51%, and finally gas convection oven #2 showed the lowest energy efficiency at 48%.

Production Capacity (lb) comparison (4):

Production capacity is the amount of product that can be produced in one hour. In order to meet the production demands of a foodservice at peak production hours, efficiency and capacity are important. In a facility that requires 350, 4-ounce servings of French fries per hour, an oven will need to produce at least 87.5 pounds of French fries per hour. Electric convection oven #4 produces the most at 102 lb/hr, followed by electric convection oven #3 at 99 lb/hr, and then gas convection oven #1 at 97 lb/hr, and finally gas convection oven #2 produces the least at 96 lb/hr. Therefore, all of these ovens would be sufficient to produce 350, 4-ounce servings of French fries per hour.

4. Compare & discuss all 6 convection ovens overall and state your top choice (6 pts).

Overall comparison:

My top choice would be the gas convection oven #1 Blodgett DFG-200-K12-ES because it meets the production demands of a foodservice at peak production hours and shows the lowest total lifetime cost at only $14865. Though it does not have one of the least expensive initial purchase costs at $3965.00, it becomes the least expensive in the long-run due to savings on energy. It shows the lowest energy cost at only $800 per year and lifetime energy cost at only $9600. Plus, the initial purchase is actually one of the lower initial cost investments of the four energy efficient models only coming after the electric convection oven #3. Though the baseline models are the least expensive options initially at only $3229.00 and $3392.00, they are not worth it in the long run because they do not save on energy. For example, the baseline gas model shows the most expensive total lifetime cost of all the gas ovens and the baseline electric oven shows the most expensive total lifetime cost of all the electric ovens. Also, despite higher initial investments, I chose a gas oven because in the long-run gas ovens are generally less expensive than electric ovens due to the energy costs of gas being less costly than electricity. Finally, I chose gas convection oven #1 over gas convection oven #2 because it has a lower initial purchase cost, lower energy costs, and a lower total lifetime cost. Gas convection over #1 shows the greatest balance between initial investments and final costs overall.

5. Complete the table below on the production capacity of your selected convection oven. Include calculations at the end of the assignment. (4 pts)

Amount of French Fries needed per hour (lbs)	Your Convection oven's Production Capacity (lb/hour)
87.5 lbs of French fries per hour	97 lbs/hr

Discuss the production capacity of your selected convection oven. Is it adequate for your needs? (3)

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The production capacity of the gas convection oven #1 Blodgett DFG-200-K12-ES is 97 lbs/hr. Since the facility needs only 87.5 lbs of French fries per hour to make 350, 4-ounce servings of French fries at peak production hours, this oven is adequate to meet its needs plus higher demands if necessary.

6. Provide a justification/proposal for your boss; to include at least the following (24 pts):
    a. Reason you need a new convection oven
    b. Which convection oven you propose to purchase
    c. Include the initial cost and lifetime cost ($) of your selected oven
    d. Why gas or electric?
    e. Include performance and production capacity
    f. Your reasons for recommending it
    g. This is a formal justification/proposal, so it must be written in full sentences
    h. Consider the number of points assigned to this portion of the assignment

Funds are requested to purchase a Blodgett DFG-200-K12-ES full gas convection oven. The facility's current convection oven is over twelve years old. To preserve the quality of food products and meet the facility's production demands during peak production hours, the convection oven needs to be replaced. Based on the analysis of six different convection ovens, the Blodgett DFG-200-K12-ES shows the lowest total lifetime cost at only $14865.00. While the initial purchase cost is $3965.00, this oven becomes the least expensive option in the long-run due to savings on energy. It shows the lowest lifetime energy cost and energy costs per year. In comparison to the alternative convection ovens, the Blodgett DFG-200-K12-ES was found to have the greatest balance between initial investments and final costs. To meet the production demands of this foodservice at peak production hours, a minimum production capacity of 87.5 lbs/hr was calculated. The Blodgett DFG-200-K12-ES meets this production demand plus more to meet higher demands if necessary, with a production capacity of 97 lbs/hr. The performance in terms of cooking energy efficiency is 51%, though gas ovens may be more efficient due to the transformation of energy in the use of electric ovens. In 2017, data in California shows that 34% of electricity is generated from natural gas. Depending on the fuel source, the production of electricity may lead to carbon emissions and pollution. Gas ovens may be the more environmentally friendly option, and generally less expensive than electric ovens due to the energy costs of gas being less costly than electricity. Over other gas ovens, the Blodgett DFG-200-K12-ES has a lower initial purchase cost, lower energy costs, and a lower total lifetime cost. I recommend this oven because it is a cost-effective option that would satisfy the needs of this facility and contribute to the quality of this foodservice.

* Gas:

Southbend SLGS/220CH:

energy cost/yr = $1359.00 (baseline e cost/yr) − $469 (annual savings) = $890.00 energy cost/yr
lifetime maintenance cost/yr = $150.00 (12) = $1800
lifetime e cost = $890 (12) = $10680
Tot. lifetime cost = ($4595 − 500) + 1800 + 10680 = $16575

Blodgett DFG-200-K12-ES:
e cost/yr = $1359 − $559 = $800
life main. c/yr = 150 (12) = $1800
life e c/yr = 800 (12) = $9600
Tot. life cost = ($3965 − 500) + 1800 + 9600 = $14865

Baseline Gas Model:
life main. c = 150 (12) = $1800
life e c = 1359 (12) = $16308
Tot. life c = $3229 + 1800 + 16308 = $21337

* Electric:
Blodgett BDO-100-E:
e cost/yr = $3093 − 394 = $2699
life main. c/yr = 155 (12) = $1860
life ec/yr = 2699 (12) = $32388
Tot. life cost = ($3795 − 350) + 1860 + 32388 = $37693

Southbend BES/19CCH:
e cost/yr = $3093 − 456 = $2637
life main c/yr = $155 (12) = $1860
life e c/yr = $2637 (12) = $31644
Tot. cost/yr = ($4165 − 350) + 1860 + 31644 = $37319

Baseline Electric Model:
life main. c = 155 (12) = $1860
life e c = 3093 (12) = $37116
Tot. life c = 3392 + 1860 + 37116 = $42368

350, 4-ounce servings: (350 × 4 oz) / 16 oz/lb = 87.5 lbs/hr