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An American National Standard

Standard Practice for Life Cycle Cost Analysis of Commercial Food Service Equipment[1]

This standard is issued under the fixed designation F2687; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard practice for life cycle cost analysis of commercial food service equipment is designed for producers and end-users to utilize when forecasting and (or) evaluating the life cycle costs of equipment by accounting for tangible differences in operating and maintenance costs of commercial food service equipment. Results of the analysis detailed in this standard practice are intended for budgetary purposes.

1.1.1 The results may also be used to compare projected life cycle cost of different models from a single manufacturer, or models manufactured by multiple suppliers, or to establish when it is cost effective to replace a specific equipment versus incurring continued maintenance expenses.

1.2 Major categories included in this analysis include total purchase price, service and repair costs, preventative maintenance costs, utility operating costs and disposal costs. The results may be quantified as a yearly running total and a net present value.

1.3 Inputs for this life-cycle analysis will need to come from a variety of sources, including manufacturers, service agents, utility companies, and end users. Not all input variables need be considered for effective analysis. To avoid skewing the results, sections where reliable estimates are not available should be left out of the analysis.

1.4 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

2. Referenced Documents

2.1 *ASTM Standards:*[2]

F1275 Test Method for Performance of Griddles

F1361 Test Method for Performance of Open Deep Fat Fryers

F1484 Test Methods for Performance of Steam Cookers

F1496 Test Method for Performance of Convection Ovens

F1521 Test Methods for Performance of Range Tops

F1605 Test Method for Performance of Double-Sided Griddles

F1695 Test Method for Performance of Underfired Broilers

F1696 Test Method for Energy Performance of Stationary-Rack, Door-Type Commercial Dishwashing Machines

F1704 Test Method for Capture and Containment Performance of Commercial Kitchen Exhaust Ventilation Systems

F1784 Test Method for Performance of a Pasta Cooker

F1785 Test Method for Performance of Steam Kettles

F1786 Test Method for Performance of Braising Pans

F1787 Test Method for Performance of Rotisserie Ovens

F1817 Test Method for Performance of Conveyor Ovens

F1920 Test Method for Performance of Rack Conveyor, Commercial Dishwashing Machines

F1964 Test Method for Performance of Pressure Fryers

F1965 Test Method for Performance of Deck Ovens

F1991 Test Method for Performance of Chinese (Wok) Ranges

F2022 Test Method for Performance of Booster Heaters

F2093 Test Method for Performance of Rack Ovens

F2140 Test Method for Performance of Hot Food Holding Cabinets

F2141 Test Method for Performance of Self-Serve Hot Deli Cases

F2142 Test Method for Performance of Drawer Warmers

F2143 Test Method for Performance of Refrigerated Buffet and Preparation Tables

F2144 Test Method for Performance of Large Open Vat Fryers

F2237 Test Method for Performance of Upright Overfired Broilers

F2238 Test Method for Performance of Rapid Cook Ovens

F2239 Test Method for Performance of Conveyor Broilers

F2324 Test Method for Prerinse Spray Valves

F2379 Test Method for Energy Performance of Powered Open Warewashing Sinks

F2380 Test Method for Performance of Conveyor Toasters

[1] This practice is under the jurisdiction of ASTM Committee F26 on Food Service Equipment and is the direct responsibility of Subcommittee F26.05 on Life Cycle Cost and Sustainability.

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

F2472 Test Method for Performance of Staff-Serve Hot Deli Cases
F2473 Test Method for Performance of Water-Bath Rethermalizers
F2474 Test Method for Heat Gain to Space Performance of Commercial Kitchen Ventilation/Appliance Systems
F2519 Test Method for Grease Particle Capture Efficiency of Commercial Kitchen Filters and Extractors
F2644 Test Method for Performance of Commercial Patio Heaters
F2795 Test Method for Performance of Self-Contained Soft Serve and Shake Freezers
F2861 Test Method for Enhanced Performance of Combination Oven in Various Modes
F2975 Test Method for Measuring the Field Performance of Commercial Kitchen Ventilation Systems
F2990 Test Method for Commercial Coffee Brewers

2.2 *ASHRAE Standard:*
ASHRAE Standard 72-2005 Method of Testing Commercial Refrigerators and Freezers[3]

2.3 *ARI Standard:*
ARI Standard 810-2006 Performance Rating of Automatic Commercial Ice Machines[4]

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *additional operating costs*—assumes miscellaneous operating expenses required for operation, including consumable supplies, for example, air or water filters.

3.1.2 *additional setup costs/quoted installation*— other installation costs such as material, travel charges etc.

3.1.3 *additional teardown costs*—other special costs that may be incurred and can be allocated to equipment teardown such as special license, dismantling of components containing hazardous materials etc.

3.1.4 *annual electricity consumption (kWh)*—average annual electric power usage rate for the appliance during its lifespan for this analysis in kWh.

3.1.5 *annual gas consumption (therms)*—average annual gas usage rate for the appliance during its lifespan for this analysis in therms.

3.1.6 *annual preventative maintenance costs*— assumes expenses to perform preventative maintenance and repair as outlined by the product's original manufacturer; assumes parts, labor, travel, supplies and additional costs incurred during a fiscal year.

3.1.7 *annual service and repair costs*—assumes expenses to perform non-scheduled service and repair on the product during a fiscal year; includes parts, labor, travel, supplies and additional costs.

3.1.8 *annual water consumption (ccf)*—average annual water usage rate for the appliance during its lifespan for this analysis in thousands of cubic feet.

3.1.9 *annualized maintenance cost*—total annual cost of a service maintenance contract that includes material (parts), labor, travel and other related costs for the period of ownership after the warranty has expired.

3.1.10 *anticipated equipment lifespan (yr)*—expected lifespan of the appliance for the purpose of this analysis or the expected years after which the appliance will be replaced. This may be projected based on input from the manufacturer, dealer, user's experience or expected operating environment.

3.1.11 *discount rate*—discount rate is defined as the rate used to convert future costs or benefits to their present value. Discounting determines the value, in today's dollars, of a benefit that will be realized at a future date. This rate varies according to interest and inflation rates.

3.1.12 *disposal costs*—assumes expenses related to decommission, dismantle, dispose and/or recycle the product at the end of its life cycle.

3.1.13 *electricity rate (USD/kWh)*—electric power rate in USD per kWh. Either the local or regional rate where the appliance is located or national average rate may be used.

3.1.14 *estimated install time (h)*—estimated time to install the appliance in hours.

3.1.15 *estimated teardown time (h)*—labor hours required for teardown.

3.1.16 *extended warranty cost*—cost of extended warranty if not included in purchase price. Typically this includes the additional cost of warranty for equalization of warranty period from different manufacturers.

3.1.17 *freight charges*—cost of shipping the appliance from supplier FOB location to desired destination.

3.1.18 *gas rate (USD/therm)*—gas (natural or propane) rate in USD per therm. Either the local or regional rate where the appliance is located or national average rate may be used.

3.1.19 *hazardous material costs*—special fees or surcharges that may be levied for removal and/or disposal of hazardous materials in the appliance or its components.

3.1.20 *hourly labor cost*—hourly labor rate of servicing the appliance during the first year of ownership period after the warranty has expired. Either the local rate where the appliance is located or national average rate may be used.

3.1.21 *hourly labor cost*—the average annual cost of non-unit producing labor in USD/hour to clean and maintain the appliance on a regular basis (excluding preventative maintenance).

3.1.22 *install labor rate*—hourly labor rate for installation labor.

3.1.23 *in-store training/demo costs*—cost of materials, labor or travel for initial training of store personnel and/or demonstration of the new appliance by dealer. This does not include recurring training expense for periodic training or new employee training.

[3] Available from American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. (ASHRAE), 1791 Tullie Circle, NE, Atlanta, GA 30329, http://www.ashrae.org.

[4] Available from Air-Conditioning and Refrigeration Institute (ARI), 4100 North Fairfax Drive, Suite 200, Arlington, VA 22203.

3.1.24 *labor inflation rate*—estimated annual inflation rate of hourly labor rate during ownership period but after the warranty has expired.

3.1.25 *labor rate*—hourly labor rate of servicing technician for teardown of the appliance at the end of appliance lifespan. Either the local rate where the appliance is located or national average rate may be used.

3.1.26 *net present value*—the net present value represents the total amount of funds required to purchase, operate and maintain the equipment of its expected lifespan using the current value of those funds, based on the discount rate.

3.1.27 *operating labor cost*—non-unit producing labor costs includes annual labor to clean and maintain the appliance on a regular basis (excluding preventative maintenance). Unit producing labor costs includes incremental gains due to reduced labor required for production. This is useful for comparing similar but different processes.

3.1.28 *other costs*—other annual costs of servicing the appliance during ownership period but after the warranty has expired, that can be quantified such as supplies, disruption etc.

3.1.29 *parts inflation rate*—estimated annual inflation rate of replacement parts during ownership period but after the warranty has expired.

3.1.30 *purchase price*—net price that will be paid to the dealer or manufacturer for this appliance.

3.1.31 *rebates/incentives*—value of total rebates from utilities, manufacturer, government or any other source, that is not included in purchase price.

3.1.32 *replacement part cost*—cost of parts that will be purchased for service during the first year of ownership period after the warranty has expired.

3.1.33 *setup/installation costs*—assumes expenses to ship the product, install, set-up and conduct initial training.

3.1.34 *sewer rate (USD/ccf)*—sewage water disposal rate in USD per thousand cubic feet (USD/ccf). Either the local rate where the appliance is located or national average rate may be used.

3.1.35 *start-up cost*—any other cost of material, labor or fees that will be paid to start operating this appliance.

3.1.36 *supplies cost*—average annual cost of supplies necessary for operating the appliance efficiently and as recommended by the manufacturer. Examples of such supplies include water filter, oil filter, de-liming solution, replaceable lining etc. but excluding preventive maintenance items.

3.1.37 *supplies inflation rate*—estimated annual inflation rate of supplies during ownership period.

3.1.38 *tax rate*—total state and local sales tax rate as a percentage.

3.1.39 *total accessories price*—cost of accessories required to operate the appliance efficiently. When comparing multiple models, add (or deduct) cost of accessories or options that are needed for equal effectiveness between two models or suppliers.

3.1.40 *total annual electricity cost*—annual cost of electricity for using the appliance in USD.

3.1.41 *total annual gas cost*—annual cost of gas fuel for using the appliance in USD.

3.1.42 *total annual labor cost*—average annual labor costs for operation of the appliance during its lifespan in USD.

3.1.43 *total annual utility cost*—average annual utility costs for operating the appliance during its lifespan in USD.

3.1.44 *total annual water/sewer cost*—annual cost of water and sewer for using the appliance in USD.

3.1.45 *total initial cost*—total cost of appliance that will be used in calculating life cycle cost.

3.1.46 *total installation/commissioning cost*— cost of installation and commissioning that will be used in calculating life cycle cost. Does not include equipment training costs.

3.1.47 *total labor hours*—average annual labor hours expended by non-unit producing personnel during the lifespan of this appliance.

3.1.48 *total teardown/decommissioning cost*—total cost of uninstalling the utility hook-ups from the appliance and removal of any special mounting adaptations.

3.1.49 *utility cost summary*—assumes utility expenses to operate the product during a fiscal year, including electric, gas, water and sewer connection costs.

3.1.50 *utility inflation rate*—estimated annual inflation rate of utilities during ownership period. An average rate for gas, electric and water/sewer may be used for the purpose of this analysis.

3.1.51 *warranty period*—warranty period of the appliance for the purpose of this analyses in years, rounded to 1st decimal.

3.1.52 *water rate (USD/ccf)*—water utility supply rate in USD per thousand cubic feet (USD/ccf). Either the local or regional rate where the appliance is located or national average rate may be used.

4. Summary of Practice

4.1 Detailed information is gathered on the capital outlay, estimated maintenance and operating costs and, if applicable, the disposal costs for a chosen piece of commercial food service equipment. This information may be collected from a variety of sources, including but not limited to, manufacturers, service agents, utility companies, and end users.

4.2 The compiled information on a chosen piece of commercial food service equipment is prorated for each operating year, using a discount rate and the net present value of the equipment is determined. The accuracy of the resulting analysis is dependant on the quality of the collected information.

4.3 The analysis is then completed for additional pieces of commercial food service equipment, as necessary.

5. Significance and Use

5.1 The results of the analysis may be used to compare to similar pieces of commercial food service equipment to determine the unit that has the lowest life cycle cost, or the highest net present value.

6. Procedure

NOTE 1—*(a)* When values are entered in the worksheet a default value of 0.0 should be used when data for a specific item is not available or if a specific item is not required for analyses. *(b)* When specific expense includes a combination of more than one item described it should be entered on the first applicable row and a value of 0.0 for other rows.

6.1 Compile details of the total purchase cost, including, but not limited to, taxes, extended warranty costs, applicable rebates, freight, and installation.

6.2 Assume an estimated lifespan for this analysis. If the actual lifespan for the equipment is unknown, then a reasonable expected lifespan of seven (7) years is recommended.

6.3 Using available sources of information estimate the annual operating costs of the equipment.

6.3.1 Annual service and repair expenses (unscheduled maintenance) include the following (as appropriate):

6.3.1.1 Replacement parts,

6.3.1.2 Service labor hours,

6.3.1.3 Hourly rate of service labor,

6.3.1.4 Travel expense for service person, and

6.3.1.5 Consumable supplies used for service.

6.3.1.6 Assume a value of cost escalation (inflation rate) during the projected life of equipment. A different value may be used for each category (6.3.1.1 through 6.3.1.5 except 6.3.1.3).

6.3.2 Annual preventive (or scheduled) maintenance costs include the following (as appropriate):

6.3.2.1 Replacement parts or annual cost of contract,

6.3.2.2 Service labor hours,

6.3.2.3 Hourly rate of service labor, and

6.3.2.4 Total of all other costs.

6.3.2.5 Assume a value of cost escalation (inflation rate) during the projected life of equipment. A different value may be used for each category (6.3.2.1 through 6.3.2.3).

6.3.3 Annual utility costs of operating the equipment:

NOTE 2—This component of equipment operation is generally of the highest value and it is also the most difficult to estimate. An incorrect value of energy consumption can disproportionately affect the utility costs and skew the resulting net present value. It is recommended that adequate research be done to enter values that are representative of the application or installation and the specific model being analyzed.

6.3.3.1 Record the electric utility rate (per kWh) for the location where equipment is being used. If the rate of electricity varies based on hours of operation, then a weighted average value should be entered. The weighted average may be calculated according to the following formula:

$$\bar{x} = \frac{\sum_{i=1}^{n} w_i \times x_i}{\sum_{i=1}^{n} w_i} \quad (1)$$

where:

$\bar{x}$ = the weighted average,
n = the total number of discrete electricity rates used in the weighted average,
x_i = the individual electricity rates, and
w_i = the number of hours applied to each corresponding electricity rate, x_i.

6.3.3.2 Estimate the total annual electricity consumption of the equipment in kWh.

6.3.3.3 If the equipment significantly contributes to the HVAC load, estimate the total annual electricity consumption for HVAC equipment required. Add that to the equipment's total annual electricity consumption to determine the total annual electricity consumption. Food Service Technology Center's Outdoor Air Load calculator is a tool that may help to determine the HVAC requirements if the amount of ventilation required for the equipment is known.

6.3.3.4 If the equipment uses gas for heating, record the cost of gas in USD per therm for the location where equipment is being used.

6.3.3.5 Estimate the total annual gas consumption of the equipment in therms.

NOTE 3—The standard energy calculations included in the applicable ASTM test methods (see Section 2) can be used to estimate the annual energy consumption of individual equipment. If no test method suitable for the product is listed in Section 2, consider the following sources for test methods: International standard, for example EN or CE; US Department of Defence (DoD) standard; Obsolete standard; Test procedure used by multiple users or manufacturers; or manufacturer's own test procedure.

6.3.3.6 If the equipment requires water for operation, record the rate of water in USD per ccf or mcf for the location where equipment is being used.

6.3.3.7 If the equipment requires water for operation, record the cost of waste water disposal or sewage rate in USD per ccf or mcf for the location where equipment is being used.

6.3.3.8 Estimate the annual water consumption in ccf or mcf (must be the same as the unit used for water and sewer costs).

6.3.3.9 Assume a value of cost escalation (inflation rate) of energy during the projected life of the equipment. A different value may be used for each utility cost (6.3.3.1, 6.3.3.4, and 6.3.3.6 through 6.3.3.7).

6.3.4 List other annual operating expenses that have not been accounted for in 6.3.1 through 6.3.3.

6.3.4.1 Estimate the annual cost of supplies or consumable material required for proper operation of the appliance and that is maintained or installed by facility personnel. Typical examples are a filter cartridges, de-liming solution etc. Materials used for cooking or direct costs of operation should not be included in this total.

6.3.4.2 Estimate the hourly cost of labor that is utilized for maintenance (such as cleaning, and regular maintenance such as changing filter, etc.) specific to proper operation of the equipment. Do not include costs associated with 6.3.2 for preventive maintenance.

6.3.4.3 Estimate the total annual labor hours for performing equipment specific maintenance or operations by the facility where the equipment is installed. Labor related to cooking or direct operations should not be included.

6.3.4.4 Assume a value of cost escalation (inflation rate) during the projected life of the equipment. A different value may be used for each category from 6.3.4.1 and 6.3.4.2.

6.4 Based on available sources and guided by experience, estimate the teardown and decommissioning costs for the equipment at the end of its useful life cycle for this particular operation. Teardown costs include labor costs of teardown,

applicable freight and disposal costs—including any costs for disposal of hazardous materials.

6.4.1 If the equipment is to be sold at the end of its useful life for a specific operation, then include the net salvage value as a negative number under "Additional Teardown Costs" and enter a value of 0.0 for all other lines of this section.

6.5 Assume an annual discount rate for this analysis. Discount rate will vary depending on the situation. Consult company accountants for the most appropriate discount rate.

6.6 Apply the discount rate to each annualized cost for every year of the estimated equipment lifespan for this life cycle analysis. Maintenance costs may be excluded during the warranty period—check the individual equipment warranty for details.

6.7 Sum the discounted annual costs, the total initial costs and the disposal costs or salvage value (if applicable).

6.8 Calculate the net present value based on the formula in Section 7.

6.9 Repeat 6.1 through 6.8 as necessary for additional pieces of commercial food service equipment.

7. Calculation and Report

7.1 For each appliance, report the manufacturer, make and model of the equipment, type of equipment (griddle, oven, range etc.) total USD value of owning the equipment, numbers of years used for the analysis, the discount rate used and the overall net present value of ownership in USD in a tabular format. An example is shown Appendix X1.

8. Keywords

8.1 commercial food service equipment; equipment life; life cycle cost analysis; net present value; operating cost

APPENDIX

(Nonmandatory Information)

X1. SAMPLE LIFE CYCLE COST ANALYSIS

X1.1 Figs. X1.1-X1.6 depict a sample life cycle cost analysis using the spreadsheet-based tool[5] provided by the North American Association of Food Equipment Manufacturers (NAFEM).

[5] The tool is available to all users from North American Association of Foodservice Equipment Manufacturers (NAFEM), 161 North Clark Street, Suite 2020, Chicago, IL 60601.

Purchase Detail

Project Title	Dave's Kitchen
Supplier	Energy Star
Equipment Name	High Efficiency Gas Fryer
Model Number	HEG-1
Initial Cost Summary	
1 Purchase Price	$ 3,500.00
2 Total Accessories Price	$ 300.00
3 Taxes (if applicable)	$ 228.00
Tax Rate	6.00%
4 Rebates/Incentives (if applicable)	$ 500.00
5 Extended Warranty Cost (if applicable)	$ –
Warranty Period (in years)	0
Total Initial Cost	***$ 3,528***
Setup/Installation Costs	
6 Freight Charges	$ 350.00
7 Installation/Commissioning	
Install Labor Rate	$ 60.00
Estimated Install Time (h)	1.00
Additional Setup Costs	$ –
Total Installation/Commissioning Cost	**$ 60.00**
8 In-Store Training Costs	$ 150.00
Total Setup/Installation Cost	***$ 560.00***
Equipment LifeSpan	
9 Anticipated Equipment Lifespan (in years)	5

Additional Comments:

Note:
Initial Cost Summary—Assumes the total cost of the basic product, including initial purchase, accessories and taxes (if applicable).
Setup/Installation Costs—Assumes expenses to ship the product, install, set-up and conduct initial training.

FIG. X1.1 Sample Life Cycle Model Purchase Detail

Service Detail

Project Title	Dave's Kitchen
Supplier	Energy Star
Equipment Name	High Efficiency Gas Fryer
Model Number	HEG-1
Annual Service and Repair Costs	
1 Parts	
Replacement Part Cost	$ 80.00
Parts Inflation Rate	2%
2 Labor	
Hourly Labor Cost	$ 60.00
Total Labor Hours	$ 2.00
Labor Inflation Rate	2%
Total Annual Labor Cost	**$ 120.00**
3 Travel	
Labor Cost	$ 30.00
Labor Inflation Rate	2%
4 Shop Supplies	
Shop Supplies Cost	$ –
Supplies Inflation Rate	2%
5 Other Costs	$ 25.00
Or Enter	
Annualized Maintenance Cost	$ –

Additional Comments:

Note:
Annual Service and Repair Costs—Assumes expenses to perform non-scheduled service and repair on the product during a fiscal year; includes parts, labor, travel, supplies and additional costs.

FIG. X1.2 Sample Life Cycle Model Service Detail

PM Detail

Project Title	Dave's Kitchen
Supplier	Energy Star
Equipment Name	High Efficiency Gas Fryer
Model Number	HEG-1
Annual Preventative Maintenance Costs	
1 Parts	
Replacement Part Cost	$ 25.00
Parts Inflation Rate	2%
2 Labor	
Hourly Labor Cost	$ 6.00
Total Labor Hours	50.00
Labor Inflation Rate	0%
Total Annual Labor Cost	**$ 300.00**
3 Other Costs	$ 10.00
Or Enter	
Average Annual PM Costs	$ –

Additional Comments:

Note:
Annual Preventative Maintenance Costs—Assumes expenses to perform preventative maintenance and repair as outlined by the product's original manufacturer; assumes parts, labor, travel, supplies and additional costs incurred during a fiscal year.

FIG. X1.3 Sample Life Cycle Model PM Detail

Operating Detail

Project Title	Dave's Kitchen
Supplier	Energy Star
Equipment Name	High Efficiency Gas Fryer
Model Number	HEG-1
Annual Utility Cost Summary	
1A Electric Utility Costs	
Electricity Rate ($/kWh)	$ 0.100
Annual Electricity Consumption (kWh)	100
Total Annual Electricity Cost	**$ 10.00**
1B Gas Utility Costs	
Gas Rate ($/therm)	$ 1.200
Annual Gas Consumption (Btu)	80,800,000
Total Annual Gas Cost	**$ 969.60**
1C Water/Sewer Costs	
Water Rate ($/ccf)	$ 1.000
Sewer Rate ($/ccf)	$ 2.000
Annual Water Consumption (gal)	0
Total Annual Water/Sewer Cost	**$ -**
Utility Inflation Rate	2%
1 ***Total Annual Utility Cost***	***$ 979.60***
Additional Annual Operating Costs	
2 Consumables Cost	
Supplies Cost	$ 250.00
Supplies Inflation Rate	2%
3 Labor (operating/cleaning)	
Hourly Labor Cost	$ -
Total Labor Hours	0.00
Labor Inflation Rate	0%
Total Annual Labor Cost	**$ -**
4 Other Costs	$ 25.00

Additional Comments:

Note:

Utility Cost Summary—Assumes utility expenses to operate the product during a fiscal year, including electric, gas, water and sewer connection costs.
Operating Labor Cost—Labor costs includes annual labor to operate and clean the appliance on a daily basis (excluding preventative maintenance) and may include incremental gains due to reduced labor required for production. This is useful for comparing similar but different processes.
Additional Operating Costs—Assumes miscellaneous operating expenses required for operation, including consumable supplies, e.g., air or water filters.

FIG. X1.4 Sample Life Cycle Model Operating Detail

Disposal Detail

Project Title	Dave's Kitchen
Supplier	Energy Star
Equipment Name	High Efficiency Gas Fryer
Model Number	HEG-1

Disposal Costs

1 Teardown/Decommissioning	
Labor Rate	$ –
Estimated Teardown Time (h)	0.00
Additional Teardown Costs	$ –
Total Teardown/Decommissioning Cost	**$ –**
2 Freight Charges	$ –
3 Hazardous Material Costs	$ –
Total Disposal Cost	**$ –**

Additional Comments:

Note:
Disposal Costs—Assumes expenses related to decommission, dismantle, dispose and/or recycle the product at the end of its life cycle.

FIG. X1.5 Sample Life Cycle Model Disposal Detail

Summary

Life Cycle Cost Analysis Summary								
Project Title	Dave's Kitchen							
Supplier	Energy Star							
Equipment Name	High Efficiency Gas Fryer							
Model Number	HEG-1							
Year		**0**	**1**	**2**	**3**	**4**	**5**	**Total**
Initial Cost								
1 Purchase Price		$ 3,500						$ 3,500
2 Accessory Price		$ 300						$ 300
3 Taxes		$ 228						$ 228
4 Rebates/Incentives		$ (500)						$ (500)
5 Extended Warranty Cost		$ -						$ -
6 Freight Charges		$ 350						$ 350
7 Installation/Commissioning		$ 60						$ 60
8 Training		$ 150						$ 150
Initial Cost Subtotal		***$ 4,088***						***$ 4,088***
Service Costs								
Warranty Term	0 years							
1 Parts			$ 82	$ 83	$ 85	$ 87	$ 88	$ 425
2 Labor			$ 122	$ 125	$ 127	$ 130	$ 132	$ 636
3 Travel			$ 31	$ 31	$ 32	$ 32	$ 33	$ 159
4 Shop Supplies			$ -	$ -	$ -	$ -	$ -	$ -
5 Other			$ 25	$ 25	$ 25	$ 25	$ 25	$ 125
S&R Cost Subtotal			***$ 260***	***$ 264***	***$ 269***	***$ 274***	***$ 278***	***$ 1,345***
PM Costs								
1 Parts			$ 26	$ 26	$ 27	$ 27	$ 28	$ 134
2 Labor			$ 300	$ 300	$ 300	$ 300	$ 300	$ 1,500
3 Other			$ 10	$ 10	$ 10	$ 10	$ 10	$ 50
PM Cost Subtotal			***$ 336***	***$ 336***	***$ 337***	***$ 337***	***$ 338***	***$ 1,684***
Operating Costs								
1 Utilities (including water)			$ 999	$ 1,019	$ 1,040	$ 1,060	$ 1,082	$ 5,200
2 Consumables			$ 255	$ 260	$ 265	$ 271	$ 276	$ 1,327
3 Labor			$ -	$ -	$ -	$ -	$ -	$ -
4 Other			$ 25	$ 25	$ 25	$ 25	$ 25	$ 125
Operating Costs Subtotal			***$ 1,279***	***$ 1,304***	***$ 1,330***	***$ 1,356***	***$ 1,383***	***$ 6,652***
Disposal Costs								
1 Decommissioning							$ -	$ -
2 Outbound Freight							$ -	$ -
3 Hazardous Material Costs							$ -	$ -
Disposal Cost Subtotal							***$ -***	***$ -***
Yearly Total		**$ 4,088**	**$ 1,875**	**$ 1,904**	**$ 1,936**	**$ 1,967**	**$ 1,999**	
Yearly Running Total		**$ 4,088**	**$ 5,963**	**$ 7,867**	**$ 9,803**	**$ 11,770**	**$ 13,769**	***$ 13,769***
NPV of Expenses	***$10,368.50***							

NPV Discount Rate = 10%

Note:
Discount Rate—Discount Rate is defined as the rate used to convert future costs or benefits to their present value. Discounting determines the value, in todays dollars, of a benefit that will be realized at a future date. This rate varies according to interest and inflation rates.
Net Present Value—The net present value represents the total amount of funds required to purchase, operate and maintain the equipment of its expected lifespan using the current value of those funds, based on the Discount Rate.

FIG. X1.6 Sample Life Cycle Model Results Summary