Summing Up the Total Cost of Ownership: A New FEC Tool

Patricia Dillon

Dillon Environmental Associates

FEC Partner Call

March 8, 2007

Presentation Outline

- What is TCO Modeling?
- Integrating Environmental Issues
- New FEC TCO Tool
- Questions & Discussion

What is TCO Modeling?

- Systematic accounting of all costs -- direct & indirect -- related to IT investment decision
  - » Initial purchase price is relatively small part of total cost or owning and operating IT products
    - Computer
      - Networked PC costs $13,200 annually[1]
      - 15% purchase; 80% operations; 5% EOL[2]
    - PDA
      - 60% purchase, including network services; 30% operations; 10% administration[1]

Sources: [1] Gartner; [2] IDC

Examples of Costs

Acquisition & Procurement	■ **Hardware purchase or lease, including all accessories** ■ **Software licenses** ■ **Administrative Costs (bid specs, contracts, tracking purchases, delivery)**
Operations & Maintenance	■ **IT and personnel training** ■ **IT support such as network and software management; help desk** ■ **Internet, energy, furniture and floor space costs** ■ **Software & hardware upgrades & related staff downtime**
End-of-Life Management	■ **Administrative costs, including asset management, inventory tracking, contract services** ■ **Removing, consolidating, storing & shipping equipment** ■ **Sanitizing hard drive** ■ **Testing or preparing for reuse, such as reloading hard drive** ■ **Providing follow up support to recipients of donated equipment** ■ **Recycling, disposal or outsourcing fees** ■ **Value of sold products or materials**

Why Use TCO Modeling?

- Make informed decisions based on life cycle costs
- Document, evaluate and reduce costs over time
- Compare alternatives
- Plan and allocate resources
- Federal government incentives:
  - 1999 Executive Order 13123
  - FEC Gold Level Requirement
    - » *Demonstrate that you have evaluated the total cost of ownership for new equipment purchases, which ensures consideration of all life-cycle direct and indirect costs associated with an equipment purchase.*

Integrating Environmental Issues

- Impact of EPEAT$^{©}$ or ENERGY STAR$^{®}$ purchase on operations, maintenance & EOL costs?
- Consider disposition alternatives at time of purchase. Does the purchase of product take back service make sense?
- What are the costs and savings associated with increasing the % of equipment with power management features enabled?
- What is the cost of increasing product life expectancy to 4 or 5 years? What if we replace CPUs only and keep LCDs longer?

New FEC TCO Tool – beta version

- Provides TCO framework in Excel spreadsheet
  - Examples of cost categories to consider
  - Provides default values
- Compare up to 4 products or alternative life cycle scenarios

  E.g., EPEAT vs. non-EPEAT purchase; increase % of enabled units; upgrade vs. reuse vs. recycle

- Emphasis on decisions with potential environmental impact, but entry fields for other costs
- Use as is, adapt to your facility, or use as model to develop custom tool

How to Use the TCO Calculator

Step 1: Choose up to four products or life cycle management scenarios to analyze

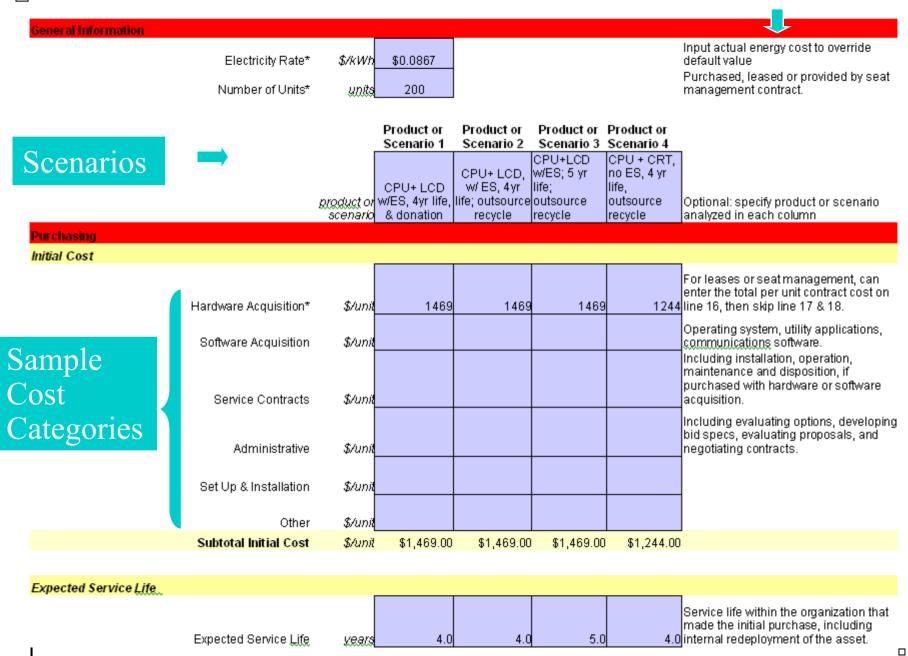**Step 2**: Enter cost data
- 4 categories: general, purchasing, O&M, EOL
- Line-by-line instructions for data entry
- Enter per unit cost, unless noted otherwise
- Only 3 mandatory fields: electricity cost, # of units, purchase price

Step 3: View Results
- Total cost per unit over service life
- Total annualized cost per unit
- Total lifetime cost of purchase
- Plus subtotals by life cycle phase

General Information

Electricity Rate*	$/kWh	$0.0867	Input actual energy cost to override default value
Number of Units*	units	200	Purchased, leased or provided by seat management contract.

Scenarios ➡

		Product or Scenario 1	Product or Scenario 2	Product or Scenario 3	Product or Scenario 4	
	product or scenario	CPU+ LCD w/ES, 4yr life, & donation	CPU+ LCD, w/ ES, 4yr life; outsource recycle	CPU+LCD w/ES; 5 yr life; outsource recycle	CPU + CRT, no ES, 4 yr life, outsource recycle	Optional: specify product or scenario analyzed in each column

Purchasing

Initial Cost

		Product or Scenario 1	Product or Scenario 2	Product or Scenario 3	Product or Scenario 4	
Hardware Acquisition*	$/unit	1469	1469	1469	1244	For leases or seat management, can enter the total per unit contract cost on line 16, then skip line 17 & 18.
Software Acquisition	$/unit					Operating system, utility applications, communications software.
Service Contracts	$/unit					Including installation, operation, maintenance and disposition, if purchased with hardware or software acquisition.
Administrative	$/unit					Including evaluating options, developing bid specs, evaluating proposals, and negotiating contracts.
Set Up & Installation	$/unit					
Other	$/unit					
Subtotal Initial Cost	$/unit	$1,469.00	$1,469.00	$1,469.00	$1,244.00	

Sample Cost Categories

Expected Service Life

		Product or Scenario 1	Product or Scenario 2	Product or Scenario 3	Product or Scenario 4	
Expected Service Life	years	4.0	4.0	5.0	4.0	Service life within the organization that made the initial purchase, including internal redeployment of the asset.

Operations & Maintenance

Training, Maintenance & Support

						Initial and on-going training for end user, including formal classes and informal assistance.
Training	$/unit					
Maintenance & Support	$/unit					Contract and staff support to maintain and support PC, including technical support, maintenance contracts and repair costs.

Unit Energy Consumption & Cost

2 Energy Options

For desktop processing units and monitors, users can choose to enter custom data on unit power consumption and usage patterns OR enter a unit energy consumption (UEC) default value. Use rows 43 and 55 to enter default values for desktop processing units and monitors, respectively. For notebooks, users can only enter unit energy consumption (UEC). Default values are provided for notebooks in row 58. To calculate a customized unit energy consumption value (for any of the above unit types) that takes additional assumptions on usage into account, please use the Electronics Environmental Benefits Calculator, sheets 8e –f, available at (add URL when available.)

Desktop Processing Units

Power Consumption in "Active" Mode	W					Enter data in rows 34 - 39 to calculate unit energy consumption for desktop processing units. For monitors use rows 46 - 51. Make sure the total hours (row 40) equals 24 hours. If data is not available, leave all cells blank in the column and enter default value in row 43.
"Stand By" Mode	W					
"Off" Mode	W					
Number of Hours in "Active" Mode Each Day	hrs/day					
Number of Hours in "Stand By" Mode Each Day	hrs/day					
Number of Hours Turned "Off" Each Day	hrs/day					
Total Hours per Day	hrs/day	0	0	0	0	Make sure total is 24 hours.
Annual Unit Energy Consumption (calculated)	kWh/yr	0	0	0	0	

OR

Default Annual Unit Energy Consumption	kWh/yr	352	352	352	371	Only enter default value if data is NOT entered in rows 34 - 39. Note: default values can be used for some product scenarios & data entered in rows 34 - 39 for other products scenarios.

		Product or Scenario 1	Product or Scenario 2	Product Scenario3	Product or Scenario 4	
		CPU+ LCD w/ES, 4yr life, & donation	CPU+ LCD, w/ ES, 4yr life; outsource recycle	CPU+LCD w/ES; 5 yr life; outsource recycle	CPU + CRT, no ES, 4 yr life, outsource recycle	

Operations & Maintenance (cont.)

Monitors

Power Consumption in "Active" Mode	W					Enter data in rows 46 - 51 to calculate unit energy consumption for monitors. If data is not available, leave all cells blank in the column and enter default value in row 55. Make sure the total hours (row 52) equals 24 hrs/day.
"Deep Sleep" Mode	W					
"Off" Mode	W					
Number of Hours in "Active" Mode Each Day	hrs/day					
Number of Hours in "Sleep" Mode Each Day	hrs/day					
Number of Hours Turned Off Each Day	hrs/day					
Total Hours per Day	hrs/day	0	0	0	0	Make sure total is 24 hours.
Annual Unit Energy Consumption (calculated)	kWh/yr	0	0	0	0	
OR						
						Only enter default value if data is NOT entered in rows 46 - 51. Note: default values can be used for some product scenarios & data entered in rows 46 -51 for other products scenarios.
Default Annual Unit Energy Consumption	kWh/yr	85	85	85	429	

Notebooks

Default Annual Unit Energy Consumption	kWh/yr					
Total Annual Energy Consumption	kWh/yr	437	437	437	800	
Total Annual Electricity Cost	$/unit/yr	37.89	37.89	37.89	69.36	
Total Electricity Cost over Expected Service Life	$/unit	$151.55	$151.55	$189.44	$277.44	For initial purchaser only

More Sample Cost Categories

		Product or Scenario 1	Product or Scenario 2	Product or Scenario 3	Product or Scenario 4	
		CPU+ LCD w/ES, 4yr life, & donation	CPU+ LCD, w/ ES, 4yr life; outsource recycle	CPU+LCD w/ES; 5 yr life; outsource recycle	CPU + CRT, no ES, 4 yr life, outsource recycle	
Power Management (PM)						
Purchase additional Software to Manage Unit Power Consumption	$/unit					Enter cost of software per unit in service. If your organization installed centralized PM software, account for these additional cost savings under unit energy consumption above.
Training to Support PM	$/unit					IT staff and end user time in training (labor rates X hours/unit)
End User Support for PM	$/unit					IT Staff (labor rate X hours/unit)
Subtotal Power Management	$/unit	$0.00	$0.00	$0.00	$0.00	
Equipment Upgrade for Internal Reuse						
Upgrade - Hardware & Software	$/unit					
Upgrade - Staff Resources	$/unit					Including IT and property management staff, if applicable. Labor rate(s) X hours
Subtotal Equipment Upgrade	$/unit	$0.00	$0.00	$0.00	$0.00	
Other Operations & Maintenance						
Other Operations & Maintenance	$/unit					Use for any items not covered above.
Subtotal Operations & Maintenance	$/unit	$151.55	$151.55	$189.44	$277.44	

EOL Cost Categories & Results

		Product or Scenario 1 CPU+ LCD w/ES, 4yr life, & donation	Product or Scenario 2 CPU+ LCD, w/ ES, 4yr life; outsource recycle	Product or Scenario 3 CPU+LCD w/ES; 5 yr life; outsource recycle	Product or Scenario 4 CPU + CRT, no ES, 4 yr life, outsource recycle	
Product Dispostion: Trade In, Sale, Transfer (to another Federal Agency), Donation, Recycling or Disposal						
Administrative overhead	$/unit	37.50	37.50	37.50	37.50	Including inventory management, transfer paperwork, payment processi... finding charitable org or recycler.
Removing equipment from desktop	$/unit	8.75				Labor rate X hours.
Backing up hard drive	$/unit	12.50				Labor rate X hours.
Media sanitization	$/unit	12.50				Including any hardware or software purchases and labor (rate X hours). T... line item cost may be included in recycling or outsource contracts.
Refurbish or upgrade equipment	$/unit	21.25				Include hardware and software costs labor (e.g. new software license and installation).
Storage	$/unit					Including cost of storage ($/ft²/month... months in storage) plus labor costs of putting in/out of storage).
Packing	$/unit	4.38				Including packing supplies and labor costs (rate X hours).
Shipping/Transportation	$/unit	25.00	25.00	25.00	25.00	
Support to Recipient	$/unit	0.00				Including labor (e.g., installation assistance, technical support) and recycling/disposition services.
Recycling/Disposal Fees	$/unit	40.00				All equipment is eventually recycled o... disposed of. Include costs to your organization and/or subsequent users
Outsourcing (any of the above)	$/unit	0.00	48.25	48.25	48.25	Cost of contract. Administrative costs pertaining to contract should be includ... here or in administrative line item abo...
Revenues	$/unit	0.00	0.00	0.00	0.00	This line item may include equipment tradein, if not included in new equipme... purchase price; equipment sale; or recycling revenue.
Other	$/unit	0.00	0.00	0.00	0.00	
Subtotal Net Disposition Cost	$/unit	$161.88	$110.75	$110.75	$110.75	
Total Cost per Unit Over Service Life	$/unit	$1,782.43	$1,731.30	$1,769.19	$1,632.19	
Total Annualized Cost per Unit	$/unit/yr	$445.61	$432.83	$353.84	$408.05	
Total Cost for Purchase of:	200	$356,486	$346,260	$353,838	$326,438	

Summary

- Tool for integrating life cycle environmental issues into IT decision-making

- Categories of costs to capture

- Next step: application of TCO modeling by FEC partners…..lessons learned
  - Use of this or other TCO tools
  - Life cycle cost savings opportunities

For Further Information

- TCO Tool – coming soon
- TCO Guidance document
  http://www.federalelectronicschallenge.net/resources/docs/costofown.pdf

Questions & Discussion of
FEC partner experience with TCO analysis?