APPENDIX 8A. USER INSTRUCTIONS FOR LIFE-CYCLE COST AND PAYBACK PERIOD ANALYSIS SPREADSHEET

TABLE OF CONTENTS

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8A.1 USER INSTRUCTIONS

The results obtained in the life-cycle cost (LCC) and payback period (PBP) analysis can be examined and reproduced using the Microsoft Excel spreadsheet available on the U.S. Department of Energy (DOE)'s website at: http://www1.eere.energy.gov/buildings/appliance_standards/commercial/small_electric_motors.html.

The spreadsheet is called "LCC_SmallMotor.xls" and it enables the user to perform a life-cycle cost and payback period analysis of small electric motor standards for three product classes: polyphase, capacitor-start induction-run (CSIR), and capacitor-start capacitor-run (CSCR) motors. The minimum requirements to run the spreadsheet are Microsoft Excel 2000 or a later, with Crystal Ball (a commercially available add-in program) installed

The LCC spreadsheet performs calculations to estimate the LCC savings and PBP due to an energy efficiency standard. The LCC spreadsheet, or workbook, consists of the following worksheets:

Summary	This worksheet summarizes the results of the LCC analysis and provides a means of changing the user and simulation options. User options provide a method of reviewing LCC results by candidate standard level (CSL) for each product class. Simulation options are used to set the electricity price trend, simulation start year, and the number of trials for a Monte Carlo simulation.
Definitions	This worksheet contains values used to populate the spreadsheet's form elements.
Simulation Results	This worksheet summarizes the mean LCC and PBP values from the distribution results produced by the simulation. This is a reporting step—values are not automatically updated. The results presented by the Department on this sheet were calculated using the default input values for electricity price trend and simulation start year.
LCC & Payback	The spreadsheet reports the results of the calculation for the "Average" scenario on the Summary worksheet. The "Average" scenario allows users to produce provisional answers without performing a Monte Carlo simulation. The Summary worksheet of the LCC spreadsheet shows the results from this worksheet.

Energy Use	This worksheet calculates the annual electricity use of each product class.
Equipment Price	This worksheet calculates the retail equipment price and total installed cost inputs for each product class. Inputs are derived from the baseline and incremental manufacturer costs of the engineering spreadsheet.
Ownership and Applications	This worksheet calculates the input data regarding ownership, applications, hours of operation, and motor loading for each product class.
Energy Price	This worksheet calculates retail electricity price distribution input data for residential, industrial and commercial sectors.
Energy Price Trend	This worksheet contains the price trends of electricity; this trend represents the growth rate of electricity prices relative to the price in 2005. DOE took price data and forecasts from the DOE Energy Information Administration (EIA)'s Annual Energy Outlook 2008 for the period until 2030. To estimate the trend after 2030, DOE followed past guidelines provided to the Federal Energy Management Program by EIA and used the average rate of change during 2020–2030 for electricity prices
Discount Rate	This worksheet contains the discount rate inputs that are used to estimate the cost of new equipment purchases.
Lifetime	This worksheet contains the distributions of the age (in years) for each product class at which equipment is retired from service.
Forecast Cells	This worksheet contains the list of output variables that are produced by the model.

Basic instructions for operating the LCC spreadsheet are as follows:

After downloading the LCC spreadsheet file from DOE's website, open the file using Excel. For the LCC spreadsheet to function properly Excel's *Macro Security Level* must be set to Medium or Low; security settings can be changed on the Security Level tab in the Security dialog box (Tools menu, Macro submenu). Click on the tab for the Summary worksheet. This worksheet provides selectors to view LCC and PBP results for specific CSLs compared to the baseline for all product classes.

The Summary worksheet also allows the user to run Monte Carlo simulations. Simulations can be configured by changing the selectors for future electricity price trend, the simulation start year, and the number of calculation iterations the simulation will produce as its distribution of results. To run a simulation, click the "Run Simulation" button (you must re-run

after changing the parameters). The progress of the simulation can be monitored by watching the count of iterations at the left bottom corner. Results are summarized on the Simulation Results worksheet.