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Analysis and Representation of Miscellaneous Electric Loads in NEMS

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Miscellaneous Electric Loads (MELs) comprise a growing portion of delivered energy consumption in residential and commercial buildings. Recently, the growth of MELs has offset some of the efficiency gains made through technology improvements and standards in major end uses such as space conditioning, lighting, and water heating. Miscellaneous end uses—including televisions, personal computers, security systems, data center servers, and many other devices—have continued to penetrate into building-related market segments. Part of this proliferation of devices and equipment can be attributed to increased service demand for entertainment, computing, and convenience appliances.

Given the dispersed and increasingly varied nature of these equipment and appliances, stock, usage, and consumption data can be difficult to obtain. EIA conducts two surveys of the building sectors, the Residential Energy Consumption Survey (RECS) and Commercial Buildings Energy Consumption Survey (CBECS), which provide information on the equipment stock and energy consumption of major end-use equipment within existing buildings. While some devices and appliances are captured in this process, it is impossible to account for all MELs within buildings using these large-scale survey methods. These surveys also do not capture estimates of consumption for end uses outside of buildings, such as water treatment and distribution or telecommunications equipment.

The Residential Demand Module (RDM) and Commercial Demand Module (CDM) of the National Energy Modeling System (NEMS) generally project annual energy consumption of MELs by combining unit energy consumption (UEC) with total stock of equipment or devices by type.¹ This differs from major end-use equipment, which is modeled using a technology menu accounting for equipment vintage, performance, and costs.

The contract reports in Appendix A and Appendix B characterize a number of residential and commercial MELs and provides the informational basis for modeling these projections with a consistent perspective on equipment stock and annual energy consumption across end uses. This enables more detailed and specific MEL projections and analysis. Appendix A was used in developing Reference case projections implemented during the AEO2014 cycle and Appendix B data are used to develop AEO2018 projections.

When referencing the contract report in Appendix A, it should be cited as a report by Navigant Consulting, Inc. and SAIC (now Leidos, Inc.) prepared for the U.S. Energy Information Administration. The contract report in Appendix B should be cited as a report by Navigant Consulting, Inc. and Leidos, Inc. prepared for the U.S. Energy Information Administration.

¹ Additional information on the modeling of MELs can be found in the RDM and CDM model documentations, located at <https://www.eia.gov/outlooks/aeo/nems/documentation/>.

APPENDIX A

APPENDIX B
