

NEMS Buildings Sector Working Group Meeting

AEO2013 Data Development & Modeling Projects



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Overview

- Residential projects
- Commercial projects
- Projects for both sectors

Residential – RECS 2009 update

- Incorporate characteristics estimates (already released)
 - Equipment stocks, penetration, and saturation
 - Housing stock
 - Floorspace
- Incorporate end-use consumption estimates (still in progress)
 - Revise Unit Energy Consumption (UEC) estimates
 - Total consumption already released (but not relevant for NEMS)
- Change model start year to 2009

Residential – input file restructuring

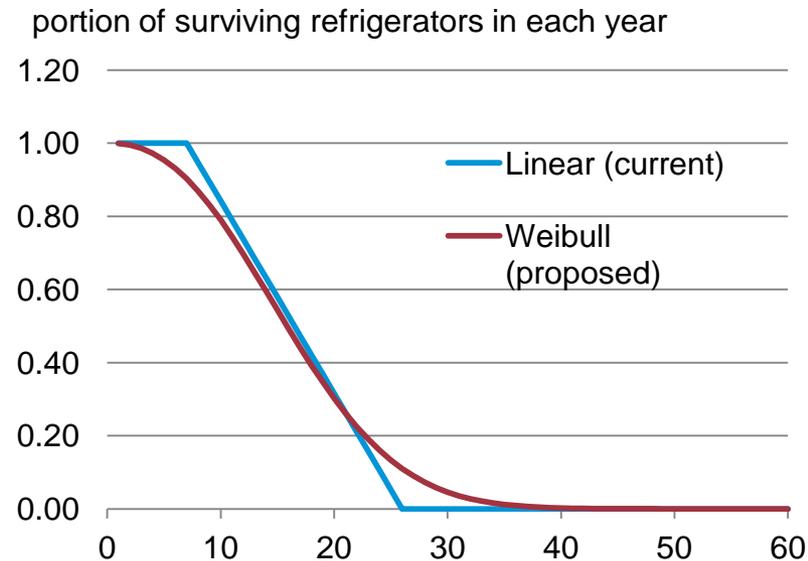
- Reorganizing inputs along functional lines
 - Combining inputs (e.g. heating equipment shares)
 - Separating (e.g. “miscellaneous” inputs)
 - Eliminating (e.g. retirement methodology)
- Renaming almost every file name
 - All files start with ‘rs’ to avoid conflict with refining or renewables

Residential – lighting submodule

- Revise input file
 - Formerly split between code and parts of rmisc.txt
 - Now in rsmlgt.txt
 - Adding outdoor lighting
- Incorporate technology update from Navigant Consulting
 - No general service incandescent bulbs after 2020
- Incorporate RECS characteristics data
- Update to DOE/EERE lighting market report 2010

Residential – retirement methodology

- Revise or eliminate up to four input files
 - rtekcl: equipment lifetimes
 - rsstkeff: stock efficiency in each year
 - rseff01: retired efficiency of base-year stock in each year
 - rsret01: percent of base-year stock retired in each year
- Weibull decay rather than linear
 - Current method uses straight-line decay between minimum and maximum lifetime values (e.g. 7 and 26 years)
- Endogenous, not exogenous



Residential – other projects

- Re-evaluate housing decay rates
- Reconsider wood pricing and elasticity
- Annual updates
 - ENERGY STAR homes (EPA)
 - Heating fuel shares in new construction (Census)
 - Square footage of new construction (Census)

Commercial – technology update, building shell

- Update characterizations of lighting, ventilation, and refrigeration equipment
 - Based on contracted report from Navigant Consulting, Inc.
 - Equipment efficiencies, capital and retail costs, average life, typical capacities
 - Vintages characterized: Installed base (2003, 2007), Standard, 2011, 2020, 2030, 2035
- Utilize previous parametric analysis data from SAIC to possibly expand side case characterization of heating and cooling shell factors for new construction
 - Models effects of differences in shell thermal characteristics on heating and cooling loads

Commercial – update capacity factors

- Awaiting award of task to update commercial capacity factors for end-use equipment
 - Capacity factor: the ratio of actual annual equipment output to output if equipment were run 100% of the time at full capacity
 - Space conditioning capacity factors currently developed from the ratio of average daily load to peak load for space heating and space cooling at various locations nationwide
 - The averages for the cities in each census division are weighted by population to compute the capacity factors used by the CDM
 - Lighting capacity factors vary by building type and are based upon the ratio of average hours of operation to total hours
 - Capacity factors for remaining services derived by service and building type from the ratio of operating hours to total hours

Commercial – input file restructuring

- Separating inputs along functional lines
 - CMELs coefficients from CDM
 - Lighting technology menu from KTEK
- Eliminating inputs that are unused
 - Files to transfer historical consumption to other sectors

Commercial – hurdle rates

- Hurdle rate: Premium + 10-year Treasury Note rate
- Update hurdle rates for Commercial customers
 - Update to most recent Johnson Controls' Institute for Building Efficiency Energy Efficiency Indicator reports indicating tolerance for return on investment (ROI) for energy efficiency
- Proportion of customers attributed to the 7 time-adjusted premium levels vary annually and by end-use
 - Across the major end-use services (Heating, Cooling, Water heating, Ventilation, Cooking, Lighting, Refrigeration)
 - Different assumptions for years affected by ARRA spending

Commercial – other projects

- Update inputs for data center consumption

Buildings – other projects

- Weather projections
 - Potentially revising long-term weather assumptions
 - Consistency with STEO
- Reevaluate non-linear component of cooling adjustment
- Update energy consumption of Miscellaneous Electric Loads (MELs) based on updated TIAX report (if completed in time for AEO2013)
 - Awaiting award of contract task
 - Update current use and trends for previously covered uses
 - Add new end uses as appropriate

Buildings – other projects

- Annual updates
 - Interconnection limitations (DSIRE)
 - Weather data and forecasts (NOAA)
 - Historical generation by and capacity of combined heat and power and renewable distributed generation systems (EIA- 860, IREC, AWEA)
- Photovoltaic system cost path
 - Tracking the Sun IV (LBNL, 2011)
 - Residential, Commercial, and Utility-Scale Photovoltaic (PV) System Prices in the United States: Current Drivers and Cost-Reduction Opportunities (NREL, 2012)
 - SunShot Vision Study (DOE, 2012)

We welcome your thoughts and suggestions

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