Annual Energy Outlook 2017

Modeling updates in the transportation sector

For
AEO2017 Transportation Working Group
August 31, 2016 | Washington, DC

By
Melissa Lynes, John Maples, Mark Schipper, and David Stone
Office of Energy Consumption and Efficiency Analysis
Updates to the *Annual Energy Outlook 2017*

- Transportation demand model highlights
  - 10-year extension of last-year projection, AEO2016 is 2040 and AEO2017 is 2050
  - Battery costs for electric vehicles
  - Phase 2 greenhouse gas and fuel efficiency standards for medium- and heavy-duty engines and vehicles
  - Freight travel updates
  - Air travel updates
Light-duty vehicle (LDV) submodule
Light-duty vehicle mandates and data updates

• Update CAFE compliance and vehicle attributes for model years 2010-14

• Update light-duty AFV historical sales and attributes
  – Choice model re-calibrated to reflect historical sales data for FFVs, Diesels, HEVs, PHEVs, HFCs, and EVs
  – Includes behavior adjustments to reflect current issues associated with diesel vehicle sales
  – Increased EV range to reflect new models

• Incorporate latest California ZEV mandates
  – Includes Section 177 (CAA) states adopting all California emission regulations:
    • CD1: Connecticut, Maine, Massachusetts, Rhode Island, Vermont
    • CD2: New Jersey, New York
    • CD5: Maryland
    • CD9: Oregon

• Update historical lithium-ion battery costs and cost projection sub-module
EV100 Lithium-Ion Battery Costs

2015 $/kW-hr

Discussion purposes only  DRAFT ESTIMATES - Do not cite or circulate
Light-duty vehicle fleet module

- Update fleet vehicle stocks through 2014 using IHS-Polk data
- Include diesel vehicles in sales algorithm
Freight transportation submodule
HDV sales, stocks, and GHG/fuel economy standards

- Add alternative fuel vehicles to sales, stocks, and fuel economy modules for classes 2b – 8
  - EVs, PHEVs, HEVs, FFVs, FCVs
  - NG and LPG (for class 2b)

- Disaggregate size classifications for sales and fuel economy in Phase 1

- Update model to incorporate final Phase 2 rule making fuel efficiency requirements and technology assumptions

- Add fuel efficiency credit allocation and banking

- Not planning to add trailers in AEO2017
Freight transportation submodule

- Update total freight ton-mile and vehicle miles traveled data and regional freight ton-mile data for truck, rail, and marine

- Freight rail efficiency and domestic waterborne freight energy efficiency were also updated

- Use higher disaggregation/representation of industry gross outputs (shipments) representation for freight drivers
Air travel submodule
Air travel submodule

• Update air travel demand (domestic and international travel for 13 world regions) and aircraft fleet efficiency
  – Re-estimate U.S. and non-U.S travel demand functions

• Update exogenous estimates of aircraft load factors, new technology characteristics, and aircraft specifications

• Update aircraft stock
  – Stock is made up of three types of aircraft: wide-body, narrow-body, and regional jets
Discussion/questions

Melissa Lynes | phone: 202-586-5192
email: melissa.lynes@eia.gov

John Maples (lead) | phone: 202-586-1757
email: john.maples@eia.gov

Mark Schipper | phone: 202-586-1136
email: mark.schipper@eia.gov

David Stone | phone: 202-586-8851
email: david.stone@eia.gov


Annual Energy Outlook | www.eia.gov/forecasts/aeo