Annual Energy Outlook 2022

Planned modeling and data updates in the transportation sector

For
AEO2022 Transportation Working Group
May 27, 2021 | Washington, DC

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AEO2022 and COVID-19

- *AEO2022* reflects updated macroeconomic projections from IHS Markit (including vehicle sales)

- The forecasts in the *Short-Term Energy Outlook* (STEO) reflect the near-term impacts of the pandemic and subsequent mitigation efforts.

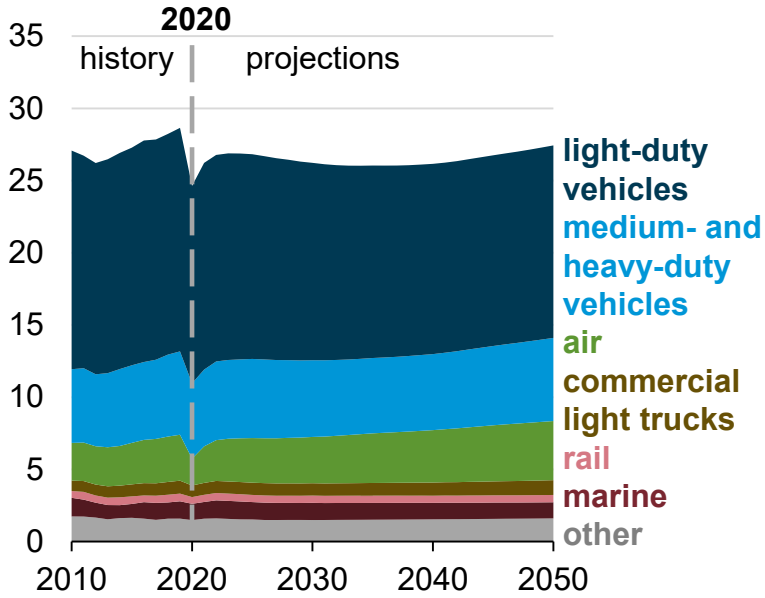
- We released an *Annual Energy Outlook Trends and Expectations* report that discusses some of the early impacts of COVID-19 on different energy sectors: https://www.eia.gov/outlooks/aeo/trends_expectations.php

Outline

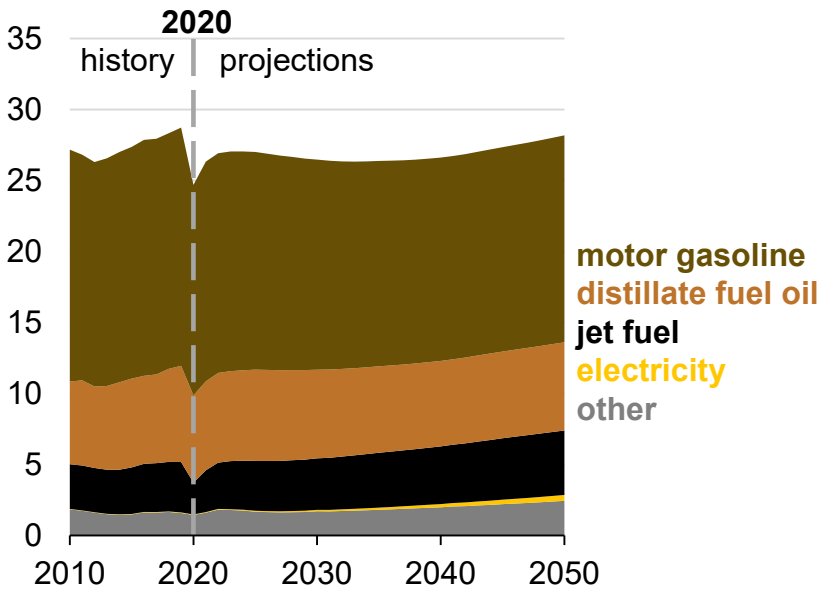
- Recap of *Annual Energy Outlook 2021* (AEO2021) Reference case
- Planned data and modeling updates for the AEO2022 Transportation Sector Demand Model
  - Light-duty vehicles (LDV)
  - Heavy-duty vehicles (HDV)
  - Air
  - Other
- Discussion

Transportation sector energy consumption remains lower than its 2019 level for entire projection period as a result of decreased travel in 2020

Transportation sector consumption by mode
AEO2021 Reference case
quadrillion British thermal units

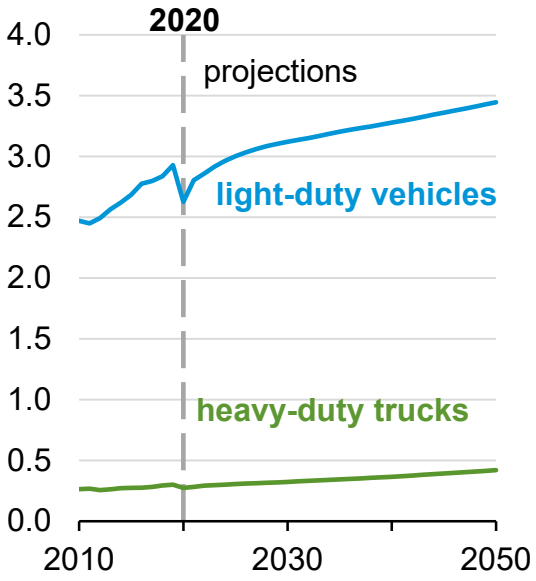


Transportation sector consumption by fuel
AEO2021 Reference case
quadrillion British thermal units

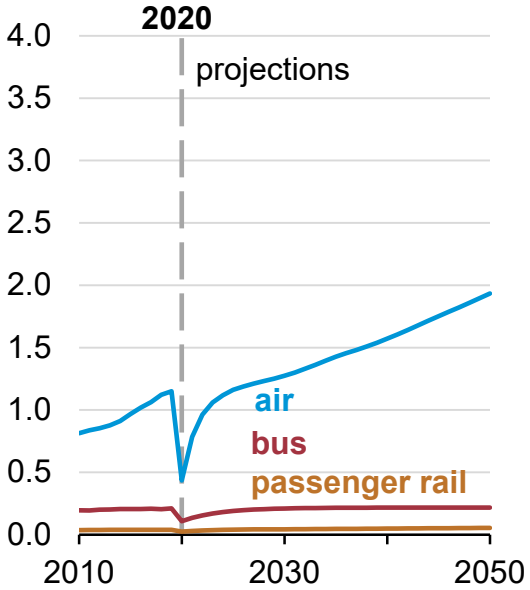


Passenger and freight travel by mode

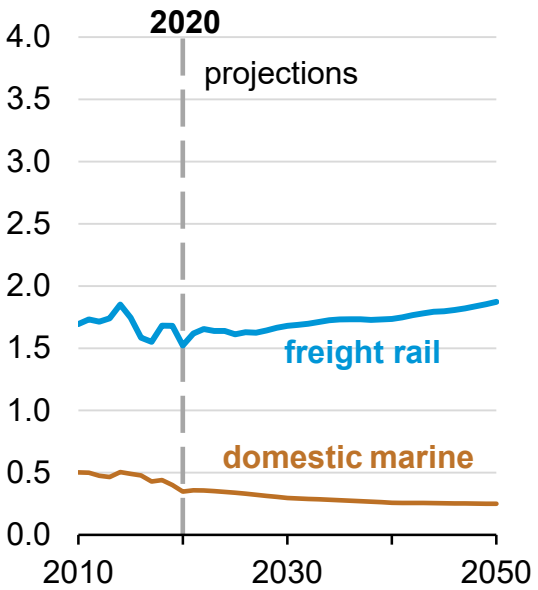
Vehicle travel
AEO2021 Reference case
trillion vehicle-miles



Passenger travel
AEO2021 Reference case
trillion revenue passenger-miles

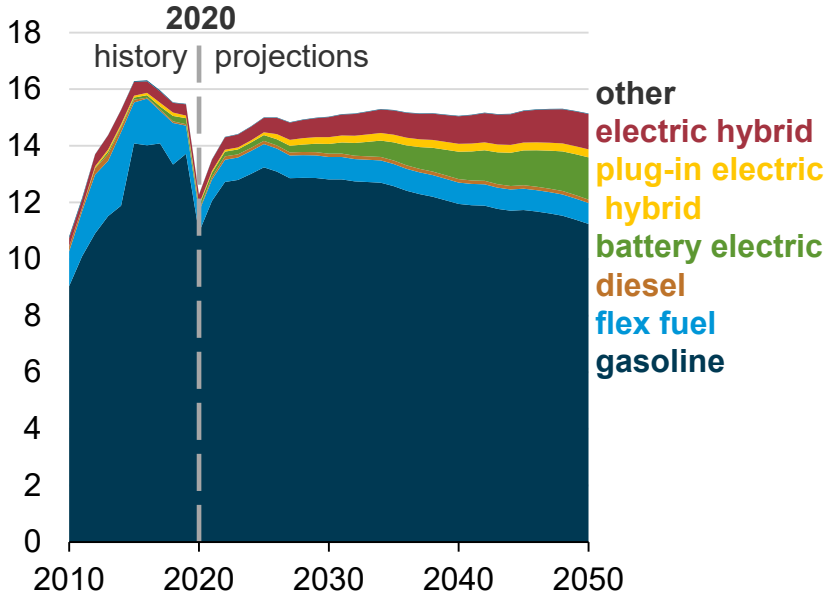


Rail and domestic shipping
AEO2021 Reference case
trillion ton-miles traveled

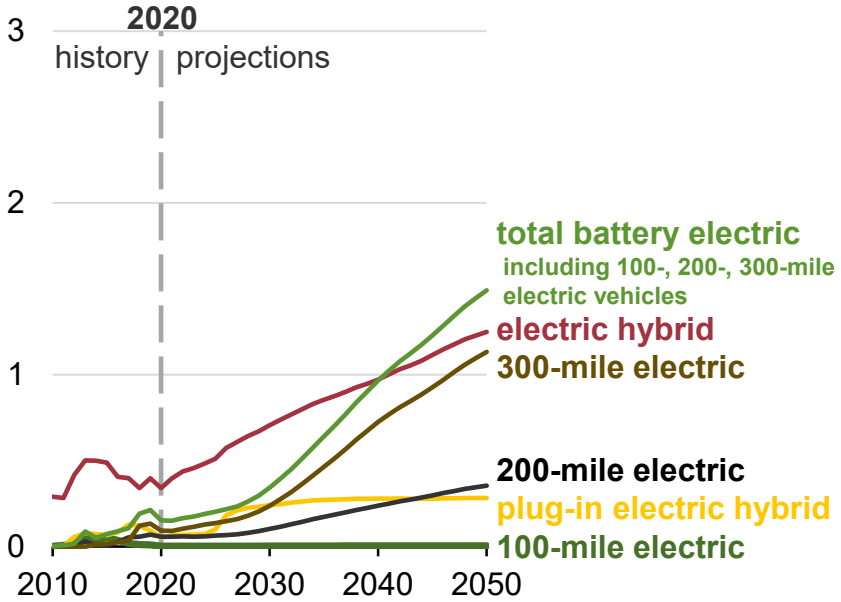


Light-duty vehicle sales by technology or fuel type

Light-duty vehicle sales by technology or fuel
AEO2021 Reference case
millions of vehicles



New vehicle sales of battery-powered vehicles
AEO2021 Reference case
millions of vehicles



Light-duty vehicle

Light-duty vehicle updates

- Update stock data update to 2019 from 2018
  - Data based on vehicle registrations by region, vintage, and fuel type, including car and light truck split based on vehicle data from the U.S. Environmental Protection Agency
- Integrate new battery model
  - Battery size relationship to pack size and vehicle weight will be dynamic
- Revise regional LDV sales and stocks distribution
- Consider pending policy changes
  - Evaluate zero-emission vehicle (ZEV) mandate
  - Evaluate state internal combustion engine (ICE) bans
  - Update electric vehicle (EV) tax credit assumptions

Heavy-duty vehicle

Heavy-duty modeling updates

- Update stock data to 2019 from 2018
  - Update based on vehicle registrations by region, vintage, fleet type, and fuel type
- Update regional travel to 2019 values, including total travel, vehicle-miles traveled (VMT) by industrial sector, and stock fuel economy
- Integrate a new EV powertrain and battery model by vehicle size class and duty cycle

Public transit

Public transit modeling updates

- Update travel demands, fuel use, and efficiency data to 2020 from 2019
  - Transit, intercity, and school buses
  - Transit, commuter, and intercity rail
  - Potential COVID-19 impacts
- Re-estimate coefficients for travel demand (PMT) equations
- Update transit bus fuel choice to account for projected growth of electric- and natural gas-powered buses

Air

Air modeling updates

- Update last historical year to 2020
  - Aircraft fleet stocks (all regions): average of *quarterly* stock data to more accurately account for the average stock throughout the year (active versus parked, by region and body type)
  - Aircraft operations (U.S. Bureau of Transportation Statistics): revenue passenger miles, freight revenue ton miles, load factors, efficiencies
- Update assumptions defining the return to pre-COVID averages based on the International Air Transport Association, International Civil Aviation Organization, Airlines For America, and others
- Re-estimate recreational aircraft and aviation gasoline projections
- Re-estimate ticket yield projection

Other data updates

Other data updates

- Update freight rail and domestic marine shipping efficiencies and ton-miles by region and industrial sector

Discussion

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