Annual Energy Outlook 2022

Prospective modeling and data updates in the transportation sector

For
AEO2022 Second Transportation Working Group
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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](https://www.eia.gov/outlooks/aeo/trends_expectations.php)
Outline

• Preliminary results from *Annual Energy Outlook 2022* (AEO2022) Reference case
  – Macroeconomic assumptions
  – Light-duty vehicles (LDV)
  – Heavy-duty vehicles (HDV)
  – Air travel

• Updates in progress

• Discussion
Macroeconomic Assumptions
Lower 16+ population in AEO2022

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Higher resulting GDP per capita

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Faster recovery, slower growth in World Oil Price

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Light-duty vehicles
Increase in total LDV vehicle miles traveled (VMT)

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Lower population offset by increased VMT per driver

index (2019 = 1.0)

AEO2021

AEO2022 (preliminary)

history projection

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
VMT per driver

index (2019 = 1.0)  
AEO2021  
AEO2022 (preliminary)

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
VMT per driver

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Stock fuel economy similar to AEO2021

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Higher total LDV energy consumption due to increased travel demand

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Medium- and heavy-duty trucks
Freight truck energy consumption decreases due to changes in industrial output

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Air travel
NEMS air travel module (TRANAIR)

Passenger travel

Revenue passenger miles
Driver: GDP/capita

Domestic
Wide body
Narrow body
Regional jet

International
Wide body
Narrow body
Regional jet

Freight travel

Revenue ton miles
Driver: gdp

Belly
Wide body
Narrow body
Regional jet

Dedicated
Wide body
Narrow body
Regional jet

WORKING GROUP PRESENTATION FOR DISCUSSION PURPOSES. DO NOT QUOTE OR CITE BECAUSE RESULTS ARE SUBJECT TO CHANGE.
Lower travel demand in the short term

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Load factors lower than AEO2021, particularly for international flights

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Higher fleet efficiency in AEO2022

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

seat miles per gallon

2021

Wide body
More parking of older jets and freighter conversions

Narrow body
Newer jets unparked to meet recovering demand

Fleet average
Newer wide and narrow body fleet

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

seat miles per gallon

2022

Wide body
Older jets unparked to meet recovering international demand

Narrow body
Older jets unparked to meet recovering demand; shift back to domestic (shorter) routes

Fleet average
Start shift back to wide bodies on international routes

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
AEO2022 fleet efficiency

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a

Continued international recovery
Slow wide body jet turnover and reversion to historical trend of transition to narrow bodies
Lower commercial jet fuel consumption due to increase in efficiency

quadrillion British thermal units

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
Total transportation energy consumption

quadrillion British thermal units

Sources: EIA, AEO2022, ref2022.0927e; AEO2021, ref2021.1130a
In progress

• Updated battery cost model

• On-road vehicle stock update (adding 2019 and 2020 registration data)

• Covid-19 impacts and recovery (LDV, transit)
Discussion
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