May 27, 2016

Vision Model Update Memo

Major Changes between Vision 2.1 and 2.0

Background

ARB's Vision scenario modeling tool was developed to enhance the Board's ability to conduct transportation system-wide, multi-pollutant analysis to inform policy development. Vision 2.1, which was used to support the 2016 Mobile Source Strategy[1], shares the same modeling structures and methodologies as Vision 2.0[2] but reflects the latest planning inventory and assessments. ARB plans to release Vision 2.1 modules during late May – June, 2016, and an revised model documentation in mid-June. This memo serves as a summary of the changes between the two Vision versions. The model and documentation will be available at http://www.arb.ca.gov/planning/vision/downloads.htm

Passenger Vehicle Module (PVM)

- Updated to reflect EMFAC2014.
- VMT adjustment scalars updated to reflect adopted Regional Transportation Plans (RTPs) and Sustainable Communities Strategies (SCSs). Updated using SCAG's draft 2016 RTP/SCS and 2015 FSTIP for remaining 17 MPOs.
- ZEV UBUS sales in South Coast and Metropolitan Transportation Commission (MTC) regions now includes both BEV and FCEV technology.
- Assumed eStarts increase from 20 to 30% as eVMT increases from 40 to 60% between 2025 and 2050 in the Cleaner Technologies and Fuel scenario. In Vision 2.0 eStarts were fixed at 20%.

Locomotives Module

- Updated Tier 4+After Treatment (Tier 5) emission factors for PM and NOx to match those currently in the Rail Technology Assessment[3].
- Updated the fuel efficiency for the Current Control Programs scenario and the SIP scenario such that both have the same fuel efficiency for all tiers.
- Updated the Tier distribution for all Tiers to match the proposed measures in the Mobile Source Strategy.

Ocean Going Vessel (OGV) Module

- Refined and enhanced model structure such that the calculations and outputs are easier to follow.

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[1] 2016 Mobile Source Strategy http://www.arb.ca.gov/planning/sip/2016sip/2016mobsrc.htm
[2] Draft Vision 2.0 Modeling System General Model Documentation http://www.arb.ca.gov/planning/vision/docs/vision2.0lr_model_documentation.pdf
[3] Draft Technology Assessment: Freight Locomotives http://www.arb.ca.gov/msprog/tech/techreport/freight_locomotives_tech_report.pdf

Heavy Duty Vehicle (HDV) Module

- Updated to reflect EMFAC2014.
- VMT adjustment scalars updated to reflect adopted Regional Transportation Plans (RTPs) and Sustainable Communities Strategies (SCSs). Updated using SCAG's draft 2016 RTP/SCS and 2015 FSTIP for remaining 17 MPOs.
- Refined the fuel efficiency improvement assumptions for medium and heavy duty GHG Phase 2 to account for the latest federal regulatory developments.
- Updated and expanded the assumptions for Last Mile Delivery trucks beyond South Coast to statewide level and incorporate fuel cell technology.
- Refined the assumptions for diesel vs. natural gas Low-NOx standard truck populations to better reflect the truck vocations and anticipated availability of natural gas fueling infrastructure.
- Added a new ZEV scenario to illustrate the potential growth for zero emission technologies in the heavy duty truck sector.

Energy Module (EM)

- Refined fuel export function to include two different methodologies to account for refined fuel exports.
    - Original: After expending supplies to meet demand, all remaining CARBOB, ULSD, and CA JET supplies are assumed to be exported. This is accounted for on a year by year basis.
    - Added: After expending supplies to meet demand, all remaining CARBOB, USLD and/or CA JET supplies are assumed to be export up to the amount exported in a specified base year (default of 2012). This is accounted for on a year by year basis.
- Emission Factors:
    - The WTT criteria emission factors were modified to incorporate public data sources and standardize the methodology. This changed both the California emission factors, as well as the emission factors used for facilities external to California.
    - Composition and volumes of fuels were updated to incorporate LCFS 15-day changes in the final LCFS rulemaking. This change affected the volume weighted aggregation of emission factors.
- Blending/Supply Inputs
    - Blending and volume data were updated to incorporate LCFS 15-day changes in the final LCFS rulemaking[4].
    - Minor modifications to blending/volumes to account for changes in transportation energy demand from modifications to the Passenger, HDV and Off-Road modules. These modifications recalibrated the model to continue to meet the 2030 and 2050 targets.

[4] Low Carbon Fuel Standard Regulation https://www.arb.ca.gov/regact/2015/lcfs2015/lcfs2015.htm