TCEQ Modeling for the 2008 Ozone Standard

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Southeast Texas Photochemical Modeling Technical Committee Meeting
November 29, 2018
HGB and the 2008 Ozone Standard

- Designated “Marginal” with Attainment Date of July 20, 2015
- Reclassified “Moderate” with Attainment Date of July 20, 2018
- Proposal to reclassify to “Serious” with Attainment Date of July 20, 2021

- On 11/14/2018, EPA proposed that the DFW and HGB areas failed to attain and attainment demonstration SIPs will be due no later than 12 months after the effective date of final reclassification.

  - EPA will accept comments on the proposed SIP due date and other RACT deadlines until 12/14/2018 at https://www.regulations.gov under Docket ID No. EPA-HQ-OAR-2018-0226. Follow the online instructions for submitting comments.
Ozone Modeling in SIP Development

One Year Typical Development

1. Base Case
   - Day-specific emissions and meteorology; replicate what actually happened

2. Baseline Case
   - Typical emissions and day-specific met; used in RRF to predict future design values

3. Future Case
   - Apply future growth + on-the-books controls to estimate future ozone precursor emissions

4. Control Strategy Testing
   - Determine control strategies that will effectively reduce ozone (if applicable)

5. SIP
   - Document modeling results and procedures
Modeling Episode and Configuration

- **Episode**
  - Base year: May – Sep 2012
  - Future year: 2020

- **Domains:** 36, 12, 4km

- **CAMx 6.5+ with CB6r4**
  - Update from 6.31

- **WRF 3.7.1**
  - No change
2012 Emission Inventory - Point Sources

- 2010 from EPA 2011 Platform v2
- Ozone Season Day: EPA 2011v6_v2 Modeling Platform
- EGUs: 2012 EPA Air Markets Program Data
- STARS 2012_v7a
- 2012 Interpolation from EPA 2011 Platform v2 using 2008 EI
- 2011 Gulf Wide EI
2020 Emission Inventory - Point Sources

2010 from EPA 2011 Platform v2

Ozone Season Day: 2020 Projection from EPA 2011v6_v2 Modeling Platform

2020 Projections from STARS with HECT and MECT caps

EGUs: 2020 Cross State Air Pollution Rule (CSAPR) Allocations including coal shutdowns

2018 Projection from EPA 2011v6_v2 Modeling Platform

2011 Gulf Wide EI
2012 & 2020 Emission Inventory - Area Sources

- 2010 Environment Canada Annual and Oil and Gas Inventories
- EPA 2014 NEI (projected to 2020)
- 2014 TexAER projected to 2012/2020
- 2012/2018 Interpolation from EPA 2011 Platform v2 using 2008 EI
2012 & 2020 Emission Inventory
On-Road Sources

2006 Environment Canada
MOBILE6-Canada adjusted to
2012/2020

MOVES2014a Default Runs for 2012
and 2020

MOVES2014b links from TTI
for DFW and HGB;
MOVES2014a HPMS for rest
of Texas

1999 MOBILE6-MEXICO
adjusted to 2012/2020
Emission Inventory – Expected Updates

- Updated 2020 Point Sources for cap-and-trade program allocations and base-year projections
- MEGAN3 or BEIS biogenic emission model choice
- 2018 Oil and Gas update (latest Railroad Commission of Texas data)
- 2012 DFW and 2020 DFW and HGB link-based On-road Mobile (Texas Transportation Institute)
- Updated Fire EI (2018 AQRP project results)
### SIP Emissions Year for Credit Generation Projects

#### DFW Emissions Sources

<table>
<thead>
<tr>
<th>Current SIP Emissions Year</th>
<th>New SIP Emissions Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric generating units (EGU) with emissions recorded in the Environmental Protection Agency’s Air Markets Program Data for the SIP emissions year</td>
<td>2014</td>
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<td>All other point sources</td>
<td>2012</td>
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#### HGB Emissions Sources

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For more Emissions Banking and Trading info: [https://www.tceq.texas.gov/airquality/banking](https://www.tceq.texas.gov/airquality/banking)
Current

- WRF 3.7.1 w/ 45 vertical layers (+1 at the surface)
- Multi-Scale Kain-Fritsch cumulus parameterization
- Pleim-Xiu Land Surface Model (soil moisture initialized from analysis)
- YSU Planetary Boundary Layer scheme
- WSM5/WSM6 microphysics
- 3D-analysis nudging (all domains)
- Hourly 3D, surface analysis and profiler observational nudging (4km domain)
**Photochemical Model**

**Current**

- CAMx 6.50 with 29 vertical layers (+1 at the top)
  - new NetCDF file format
- CB6r4h with updated condensed halogen chemistry
- Sea salt emissions
- GEOS-Chem v2.2 Boundary Conditions
- Wesely dry deposition (replaced Zhang)

**Anticipated**

- Source Apportionment (APCA)
- Direct-Decoupled Method
What About A New Episode?

• A new multi-purpose emissions modeling platform (EMP) based on the 2014 National Emissions Inventory version 2 (2014NEIv2) is needed
  – State Implementation Plans, federal analyses
  – For the first time, EPA, states, and MJOs are engaging in collaborative EMP development
  – The 2016 base year was selected via a collaborative process

• Future years selected due to regulatory relevance
  – 2023 is relevant for Ozone NAAQS moderate areas
    • Although 2020 is relevant for 2015 O3 NAAQS marginal areas, modeling is not required for marginal areas; 2020 is relevant for 2008 O3 NAAQS reclassifications
  – 2028 for regional haze
2016 Collaborative Modeling Workgroups

- EGUs
- Non-EGU Point
- Nonpoint
- Oil and gas sources (point and nonpoint)
- Onroad
- Nonroad
- Rail
- Commercial Marine Vessels (CMV)
- Fires
- Biogenics
- Modeling
2016 Collaborative Modeling Platform Schedule

- Several versions of 2016 platform will be developed
  - **Alpha**: preliminary version based on 2014NEIv2 for some and 2016 for other key sectors (released May 2018)
    - Compatible versions of 2014 and 2015 were also released
    - For initial testing of 2016 model runs
  - **Beta**: improved and/or new version of actual 2016 emissions for most sectors and preliminary projected emissions to 2023 and 2028 (~December 2018)
  - **V1.0**: fully updated 2016 emissions and complete projected emissions for 2023 and 2028 (Early 2019)

- Schedule overlaps with 2017 NEI development
  - **Prioritize the 2017 NEI over the 2016 platform**, as needed
  - Any missing data for 2016 will be filled in based on 2014 NEI data and nationally consistent methods
Modeling Web Sites

- SET PMTC: Presentations and past meeting information

- Current Eight-Hour Ozone SIP Modeling Details
  [https://www.tceq.texas.gov/airquality/airmod/data](https://www.tceq.texas.gov/airquality/airmod/data)

- Interactive Modeling Map Results

- Interactive Modeling Time Series

- Current Modeling File FTP Site

- HGB: Latest Ozone Planning Activities
Questions?

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