

2016 Emissions Modeling Platform Development Plan

Background and Purpose

For the first time ever, states, tribes, multi-jurisdictional organizations (MJOs), and EPA will endeavor to collaborate and work together as peers to develop a national Emissions Modeling Platform for calendar year 2016 (2016 EMP) , including recommending methods to support future year projections into the 2020s with expected projection years of 2023 and 2028. The MJOs and states have asked to be actively involved in the development of the next modeling platform, and EPA is supporting this effort within the constraints of available resources. The files from this platform could be used for ozone and particulate matter (PM) / regional haze modeling by states, tribes, MJOs, and EPA. The species of interest include both ozone and PM precursors.

The purpose of this document is to outline the principles and process, and to define metrics for successful collaboration by states, tribes, MJOs, and EPA to develop a national scale 2016 EMP outside of the triennial National Emissions Inventory (NEI) process that will provide a complete and transparent set of nationally consistent emission modeling files. These files are to be modular by source sector and there is no requirement for any state, tribe, MJO, or EPA to use any or all of these files resulting from this process in air quality modeling. Herein referred to as the 2016 EMP Collaborative, this effort will focus on the improvement of key sectors and will not necessarily improve emission inventories for all sectors, although emission inputs for all sectors will be available in some form as part of the platform. EPA will assist with providing non-emissions files necessary for 12-km regional air quality modeling.

The product of the 2016 EMP Collaborative will be data files that MJOs, tribes, states, and EPA can readily modify and augment to address analysis and planning needs within their own jurisdictions.

The process to develop the 2016 EMP will proceed in the following three phases (Alpha, Beta, v1.0), each improving on the last round:

Alpha: EPA will provide a first attempt at a 2016 platform by February 2018 to provide modelers with an initial framework upon which 2016 photochemical modeling can be initiated. It will mostly consist of 2014 NEI version 2 (2014NEIv2) components but will include initial 2016 inventories for electricity generating units (EGUs), onroad mobile, nonroad mobile, fires, and biogenics.

Beta: This version will contain additional sectors of actual 2016 emissions and the first projections to future years.

Version 1.0: This will be a usable version of the 2016 EMP inventories and ancillary files with updated emissions for sectors like onroad mobile, nonroad, marine, and EGU that require additional processing and review time. Additional improvements or modifications to all emissions sectors will be explicitly documented. It will also contain a complete set of version 1 future year projections. The shift to a numeric version label signifies the maturity of the platform for modeling applications.

This document details the principles and procedures to manage the 2016 EMP Collaborative, as well as short descriptions of the workgroups and potential work items for each group. In addition, the following workbook is available with details on schedule, workgroup co-leads, and workgroup members:

<https://docs.google.com/spreadsheets/d/1NqI4azJ-TRGUZqtiq8ssxkWy4wPOkMOh-rdeJ2n78P4/edit?ts=59ce5f6c#gid=0>

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Overarching Principles and Goals for the Collaboration

Organization of the Effort

The levels of organization that comprise this effort are: 2016 EMP Collaborative co-leads, coordination committee, workgroup co-leads, and workgroup members. The 2016 EMP Collaborative co-leads are responsible for the following:

- Manage communication and documentation by workgroups and the coordination committee;
- Ensure that up-to-date, technically credible data required to prepare emissions for air quality modeling are available;
- Define processes to be followed during the development of the data;
- Help resolve issues that may arise during data development;
- Ensure that the data are distributed to stakeholders in an accessible way within the agreed-to time constraints of the effort

The coordination committee will assist with decision-making and implementation of these tasks. The 2016 EMP Collaborative co-leads are Zac Adelman, Executive Director of Lake Michigan Air Directors Consortium (LADCO), and Alison Eyth, Emissions Modeling Team Leader at EPA's Emission Inventory and Analysis Group within the Office of Air Quality Planning and Standards (OAQPS).

For each workgroup, the co-leads are responsible for prioritizing issues related to the development of emissions modeling inputs for their specific sectors, leading the interaction with the workgroup members, and ensuring that data and documentation are provided in the prescribed formats within the targeted timelines. Workgroup members are responsible for contributing to the effort of developing emissions inputs for their sectors. Additional details of the 2016 EMP Collaborative are described below.

Process Management Collaboration Principles

The following process management principles and technical procedures for collaboration apply to all workgroups:

- Oversight: The 2016 EMP Collaborative co-leads and the coordination committee will implement the organizing principles and collaboration guidelines set forth in this document (see this section), manage communication and documentation by workgroups and the coordination committee, organize and facilitate monthly meetings that include members from all workgroups, and create general charges for the workgroups. The individual workgroup leads will report back to the coordination committee on their progress at least monthly through shared documents. Issues that need resolution for work to proceed may be raised on monthly coordination calls. The 2016 EMP Collaborative co-leads are responsible for

communicating all information to the workgroup co-leads that will support the workgroups in meeting the goals of the Collaborative.

- Accountability: Each workgroup is responsible for their designated sectors and for providing outputs within the specified project timelines. Beyond this level of responsibility, each workgroup will provide documentation of work products for ongoing review and assessment by states and tribes across the country, and accept and record all comments received on each work product. The workgroup co-leads should communicate any issues with the 2106 EMP Collaborative co-leads.
- Decision-Making: Each workgroup functions mostly autonomously while actively participating in the oversight process above. Workgroup co-leads are responsible for making decisions about their sectors, while providing accountability as described above. Decisions that could impact the overall project timeline or form of the work products should be raised to the coordination committee.
- Recruitment of workgroup members and committee members: State/local/tribal (S/L/T) agencies will be made aware of this effort through their MJO modeling leads, the Federal/State Technical Work Collaborative Group and through existing inventory and modeling workgroups such as NOMAD, MJO MOVES, and the National Oil and Gas Emissions Committee. MJO/state/local/tribal staff are invited to join workgroups for which they are interested in participating. A survey instrument will be circulated to the MJO directors by MARAMA and LADCO for distribution to their states. The survey will request participation by S/L/T staff for workgroup members and yet-to-be-identified workgroup leads.

Parties interested in joining the effort after the survey closing date can still participate by contacting the workgroup leads to get added to the workgroup lists. Workgroup leads and contact information are available below with the descriptions of each workgroup.

- Communication techniques: Shared Google documents will be used to track status and issues. E-Mail lists for workgroups will be maintained, possibly through Google groups. A Wiki page will be hosted by the [Intermountain West Data Warehouse](#) (IWDW) for use in communication and documentation.
- Logistics for data and documentation sharing: The LADCO Google drive account can be used to share documentation and inventory data up to 15GB (add link). The EPA FTP site can be used to distribute finished inputs for the platform. The IWDW will host inputs on a permanent basis for distribution by any user by retrieving files from the EPA FTP site. EPA will notify IWDW when updated files are posted. Another mechanism should be identified to make processed model-ready emissions files available to members needing those - although the 15 GB in Drive can probably handle two-3 versions of processed emissions for the platform within the 15GB limit, but not final merged emissions..

- Approval and Sign-Off: Processes need to be defined by the coordination committee and address Oversight, Accountability, and Decision-Making responsibilities above.
- Success Metrics: Success metrics need to be defined by the coordination committee and address Oversight, Accountability, and Decision-Making responsibilities above.
- Participation of outside groups: Participation is limited to Federal/MJO/state/local/tribal staff. Contractors may be invited to give technical presentations at specific meetings but will not be regular workgroup members. Groups that use stakeholders should spell that out early in their formation. Rail and Marine will likely require stakeholder involvement.

Technical Collaboration Procedures

- Documentation Requirements: Each workgroup will be responsible for producing documentation on the methods and results of the inventory development. A specification sheet template will be developed for each workgroup to use as a starting point for documenting the inventory data product. The general specifications for the inventory process will include: (1) an introduction to the sector (what's included in the sector, including a list of SCCs); (2) inventory development methodology (what data were used, how were they processed, why was this method selected); (3) ancillary data description (are there spatial/temporal/chemical profile/cross reference data that accompany the inventory and how were these developed); (4) emissions projection methods and data; (5) modeling requirements describing any special considerations needed to process these data for use in photochemical models; (6) once emissions are available, emissions summaries should include tabulated data (i.e., annual state total emissions for CO, NO_x, VOC, NH₃, SO₂, PM_{2.5}) for 2016 and future years, tabulated comparison of the 2016 inventory to 2014v2 (and 2011v6.x?), tabulated comparison of future year inventories for 2016, 2014, and 2011 platforms, graphical summary of 2016 and future year inventories (thematic maps of annual county total emissions for criteria pollutants, 12-km CONUS gridded maps of annual emissions for criteria pollutants). As the specifications for some sectors may not fit exactly into the provided template, it will be the task of the workgroup chairs to tailor the specification sheet as needed. The specification sheets should contain sufficient detail to provide complete documentation on how the 2016 inventory was developed and projected to future year(s), how the data should be processed for photochemical modeling, and summaries of the data with comparisons to contemporary versions of the NEI.

The workgroup leads will maintain a change log specified by the coordination committee for each working inventory version. The change log will be included as an appendix to the specification sheet and will describe the activities of the working group (possibly as minutes from group meetings) and what key activities the group is currently working on to build the inventory. Milestones and major changes made to the inventory should be noted in the change log. The purpose of this log will be to provide the coordination committee and other

group leads a central location for finding information about what each workgroup is doing through the inventory development cycle.

- Expected products: Along with the specification sheets, each workgroup will provide SMOKE-ready inventories and ancillary data, as needed, in the most recent Flat File and ancillary data formats. The specification sheets should include any special instructions for processing the data and summaries of the inventory data for each sector.
- Sector Versioning: Each workgroup inventory sector will be versioned with the date on which it was produced. The reason is to support the concept that inventory platforms are compiled as different versions/vintages of each sector. For example, biogenics may be developed only once through the entire 2016 development cycle, while nonroad mobile may have 3 different versions. The 2016 beta platform will then likely be an aggregate of the versions of the different sectors available at a timeframe that makes sense to collate into a platform during the summer of 2018. Additionally, if groups have modeling requirements that are on different schedules, the best available sector versions at any given time could be collated into an inventory and used for modeling. Versioning the sectors, while adding a layer of complexity, will facilitate flexibility in the timing for how these data are used and what documentation is available for each modeling platform.
- Timeline and Milestones:
 - 2016 alpha from EPA (2016a) - February 2018
 - Base 2016 inventory only
 - Inventory development: Fall 2017 - Early 2018
 - Draft Specification Sheets: December 2017
 - Photochemical modeling by MJOs: Winter/Spring 2018
 - Model performance evaluations: Spring/Summer 2018
 - 2016 beta (2016b) - Summer 2018
 - Base 2016, 2023, and 2028 projections
 - Inventory development/refinement: Spring/Summer 2018
 - Projections: February - Summer 2018
 - Draft Specification Sheets: Summer 2018
 - Photochemical modeling by MJOs: Summer/Fall 2018
 - Model performance evaluations: Fall 2018
 - 2016 version 1.0 (2016v1.0) - Early 2019
 - Base 2016, 2023, and 2028 projections
 - Inventory development/refinement: Summer 2018 - Early 2019
 - Projections: Summer 2018 - Early 2019
 - Draft Specification Sheets: Fall 2018
 - Final Specification Sheets: Winter/Spring 2019
- Assessment and evaluation of inputs/products: The 2016 emissions products will be quantitatively evaluated directly through comparison to previous inventory versions and by proxy through air quality model performance evaluation. Qualitative assessment of the data

products will be made initially by the workgroups and through comments received from outside stakeholders on the inventory specification sheets.

The specification sheets will include emissions summaries that compare the 2016 inventories with the 2014NEIv2, the 2011v6 modeling platform, and with other versions of the 2016 inventory, if applicable. If there are specific sources (e.g. certain SCCs) within a sector that are responsible for large changes between inventory versions, an analysis of these sources should be presented by the workgroup. Timely air quality modeling with the 2016 inventory products should be completed throughout the course of the development cycle. Comparison of the model results with surface observations and insights from these comparisons into the quality of the emissions should be part of the evaluation process for each version of the 2016 inventory. If deficiencies or errors in the 2016 inventory are revealed through this evaluation process, the workgroup should propose solutions to rectify the deficiency in the subsequent version of the inventory.

Representative Review and Comment: Each workgroup will provide documentation of work products for ongoing review and assessment by states and tribes across the country, and accept and record all comments received on each work product. Further, a more complete process for sharing information about the 2016 EMP with others outside the collaborative and receiving input from outside stakeholders will be defined by the coordination committee. For example, sector specification sheets and documentation from workgroups could be posted for review and comment by stakeholders outside of the 2016 EMP Collaborative for the 2016 alpha, beta, version 1.0, and v1 projections.

Selected key elements for focus in the national 2016 EMP effort

For each emissions modeling sector, the currently known timelines for data becoming available are summarized below, along with a first draft of known issues that need to be addressed as part of EMP development. The list of data sets given below is not complete and only represents a starting point for the review of each sector. Workgroups will be formed to develop and project inventories and emissions modeling techniques (e.g., spatial allocation, temporal allocation, speciation) for key sectors and in some cases work will happen under the umbrella of existing workgroups. Note that some workgroups may address multiple modeling sectors.

The workgroups will be responsible for identifying and prioritizing issues that could be addressed within the available timeframe to address those issues. The workgroups should be cognizant of the overall target timelines for pulling together different versions of the platform and strive to meet those. Therefore, the workgroups will need to prioritize the issues to work on, while keeping the development of data for each sector within the overall 2016 EMP Collaborative schedule. File formats for workgroup output data should be compatible with SMOKE. Note that EPA plans to provide 12km meteorological data, and eventually boundary conditions.

Biogenics

Workgroup Staffing Recommendations: Jeff Vukovich will be EPA co-lead. No MJO/state co-lead has yet volunteered.

Available 2016 biogenic data: EPA can provide BEIS 3.61 outputs for 2016 for evaluation. These BEIS 3.61 outputs were generated using Biogenic Emissions Landuse Database (BELD) version 4.1. BELD version 4.1 is based on version 5.1 of the USDA-USFS Forest Inventory and Analysis (FIA) vegetation speciation data from 2001 to 2014. Canopy coverage is based on the Landsat satellite National Land Cover Database (NLCD) product from 2011. The FIA includes approximately 250,000 representative plots of species fraction data that are within approximately 75 km of one another in areas identified as forest by the NLCD canopy coverage. The 2011 NLCD provides land cover information with a native data grid spacing of 30 meters. For land areas outside the conterminous United States, 500 meter grid spacing land cover data from the Moderate Resolution Imaging Spectroradiometer (MODIS) is used.

Biogenic Workgroup Tasks: A new version of MEGAN (v3.0) is due to be released in late 2017. The workgroup may have the opportunity to compare the emission estimates using this new version of MEGAN with the existing version of BEIS 3. The workgroup has requested more information including documentation, source code and any other available ancillary data for MEGAN v3. After this MEGAN v3 documentation/data is acquired, the workgroup will determine if a comparison with BEIS 3 can be carried out for year 2016. MEGAN v2.10 (<http://lar.wsu.edu/megan/guides.html>) will also be used for comparison by the workgroup. Resources permitting, the Biogenics workgroup should also review the input data used to generate the BEIS 3 (and if possible MEGAN) estimates. Possible improvements to input data will be documented. Note that parts of Canada and Mexico are important for complete biogenic emissions estimates.

Fires

Workgroup Staffing Recommendations: Tom Moore will be MJO co-lead and Jeff Vukovich will be the EPA co-lead.

Available 2016 fire data: A draft version of year 2016 **wild and prescribed fires** prepared by running SMARTFIRE2 and BlueSky using activity data sets including the Hazard Mapping System, Incident Status Summary (ICS-209) reports, and Geospatial Multi-Agency Coordination (GeoMAC) is available. The data set characterizes residual smoldering separately from smoldering that happens concurrently with flaming.

For 2016 **non-US fires**, the Fire INventory from NCAR (FINN) data for 2016 for Canada and Mexico has been processed into a format that can be used as input to SMOKE and heat flux has been estimated. Since the FINN fires were developed, Environment Canada has also provided data for fires in Canada for April 1 - December 22, 2016.

For 2016 **agricultural fires**, a day-specific FF10 point dataset developed using the same method as the point agricultural fire data in the 2014 NEI is available.

Note that Georgia plans to develop their own fire inventory for their state and provide to the workgroup. It is important that it be developed for 2016 and in format needed. We request that Georgia share their methods with the workgroup for review and discussion.

Fire Workgroup Tasks: The Fires workgroup should review each of the fire datasets for correctness and completeness. Potential issues with / improvements for the fire datasets will be documented. If it is determined that considering additional inputs to compute the fires or adjustments to the fire estimates would be helpful, it will be determined whether resources are available to an updated version of the 2016 fires can be developed in FY18. The workgroup should also consider whether it is advantageous to split wild and prescribed fires during processing, and the state of plume rise calculations with residual smoldering as compared to flaming / smoldering. Once treatment of the fires for year 2016 has been confirmed, the workgroup should consider options regarding how fires could be represented for different types of future year analyses and document the pros and cons of each approach. Resources permitting, the workgroup may then decide to prepare alternative versions of fire inventories that could be deemed appropriate for different types of analyses.

Electric Generating Units (EGUs)

Workgroup Staffing Recommendations: Julie McDill has offered to be the MJO/State co-lead and Serpil Kayin of the Clean Air Markets Division (CAMD) has offered to be the EPA co-lead of this group. ERTAC EGU would be the logical committee to ask take on development of this sector and a regular interaction with CAMD has already been established.

Available EGU data: By the end of 2017, the 2014NEIv2 will have estimates of EGU emissions, stack parameters, and locations for 2014. In addition, CAMD Continuous Emissions Monitoring System (CEMS) data for 2016 is available and could be folded into the the 2014 emissions fairly easily. States will submit 2016 emissions by January, 2018 and those will be compiled into a 2016 point source inventory by summer, 2018.

EGU Workgroup tasks:

1. The ERTAC EGU committee is starting to develop a base year 2016 for future year projections and something should be available in time for the December 2017 release. In Spring 2018 2016 is likely to be refined and projections will be made, targeting a complete package of base and future year projections by the Summer 2017 platform release.
2. State review of source characteristics -The EGU workgroup should consider whether to encourage states to pay additional attention to their submissions of 2016 point sources, and/or review and update the source characteristics in ERTAC EGU.

3. Sort sources traditionally reported by CAMD into two groups: Yes ERTAC and No ERTAC. This will allow states to easily substitute ERTAC EGU in the case where EPA chooses another method to project EGU emissions.
4. Review the operation of CEMCorrect program and whether it is desirable to use this program to remove unmeasured spikes from CEMS data in the 2016 platform.
5. Possibly differentiate between alpha and beta versions of data.

Point/Non-EGU

Workgroup Staffing Recommendations: Caroline Farkas will be the EPA co-lead. A state/MJO co-lead has not yet volunteered..

Available non-EGU point data: By the end of 2017, the 2014NEIv2 will have estimates of non-EGU point emissions, stack parameters, and locations for 2014. States are required by the Air Emissions Reporting Rule (AERR) to submit 2016 emissions for “A” sources by January, 2018 and those will be compiled into a 2016 point source inventory by summer, 2018. Most states only submit “A” sources for the non-periodic emission inventory years.

Non-EGU Point Workgroup tasks: The non-EGU point workgroup should consider whether to encourage states to pay additional attention to their submissions of 2016 point sources. This might include reporting of more than just the “A” sources.

Consider appropriate near-term and longer-term projection approaches for non-EGU point source emissions. EPA has used various techniques to project different types of sources. Consider options for projecting sources that consider closures, the impact of on-the-books federal and state rules, and changes in activity data. The diverse nature of the sources in this sector make projections challenging.

Point/Aircraft (part of non-EGU point)

Workgroup Staffing Recommendations: This subsector will be part of the non-EGU point workgroup’s responsibility because that is the sector to which these emissions belong.

Available aircraft data: The 2014NEIv2 non-EGU point inventory includes aircraft emissions for year 2014.

Workgroup tasks:

1. **Base year** - Confirm whether 2014NEIv2 needs any further work.

2. **Near-term projection to 2016** - Determine an acceptable method for preparing 2016 estimates of aircraft emissions, or decide that it is appropriate to keep emissions at 2014 levels in 2016 modeling.
3. **Future year projection** - Determine a method for estimating aircraft emissions for years in the 2020s. The current EPA approach is to project aircraft take-offs and landings using information available from the Federal Aviation Administration's (FAA) Terminal Area Forecast (TAF) System: https://www.faa.gov/data_research/aviation/taf/ (publication date March, 2014). This information is available for approximately 3,300 individual airports, for all years up to 2040. The workgroup will need to determine whether this is the most suitable indicator to continue to use for projections or specify and provide a more updated or appropriate indicator data set available. The workgroup should review whether there is a of the TAF later than 2014 that could be used.

Oil and Gas - Point and area

Workgroup Staffing Recommendations: Jeff Vukovich will be an EPA co-lead and Tom Moore will be the MJO co-lead. The National Oil and Gas Committee will participate in the development of this sector.

Available area and point oil and gas data:

1. **Point:** By the end of 2017, the 2014NEIv2 will have 2014 estimates of point oil and gas emissions, stack parameters, and locations. States will submit 2016 "A" source emissions by January, 2018 and those will be compiled into a 2016 point source inventory by summer, 2018.
2. **Area:** By the end of 2017, the 2014NEIv2 will have 2014 estimates of area oil and gas emissions.
3. **Growth factors:** EPA has developed projection factors which could be used to approximate 2016 point oil and gas emissions; these factors could potentially be made available.

Oil and gas Workgroup tasks:

1. **Base year:** Determine the suitability of 2014NEIv2 point and area emissions.
2. **Growth factors:** Review available factors developed by EPA for their use for both point and area sources. Are the appropriate for all SCCs?
3. **Point/nonpoint reconciliation:** Issues related to the reconciliation of point and nonpoint sources for these sectors should be considered.
4. **Near-term projection to 2016:** Consider whether growth/control factors should be applied to 2014NEIv2 point and area to estimate 2016 emissions. For point sources, consider whether to encourage states to pay additional attention to their NEI submissions of 2016 point oil and gas sources. Consider appropriate near-term and longer-term projection approaches for non-EGU point source emissions. The workgroup will need consider options for projecting sources that consider closures, the impact of on-the-books federal and state rules (e.g., NESHAPs, NSPSs) and changes in activity data.

5. **Future year projection:** Consider techniques that would be appropriate to project emissions to years in the 2020s.
6. **Speciation and spatial allocation** of area source oil and gas sources should be reviewed, and changes in activity data.

NOMAD Nonpoint Source Categories

Workgroup Staffing Recommendations: Caroline Farkas will be an EPA co-lead. No state/MJO co-leads have yet volunteered. The EPA-organized NOMAD Committee, which has membership from MJOs, states and EPA, may play a role in developing the emissions for the sources in this sector. A discussion with NOMAD was held on 10/18/17. No immediate volunteers arose for the workgroup, but they were notified to keep an eye out for word from their MJO leads.

Available data:

An estimate for 2014 emissions (2014NEIv2) will be available by the end of 2017 for all categories as follows:

- **Area fugitive dust (afdust)**
- **Agricultural (ag):** In recent platforms, the ag sector has been limited to ammonia (NH₃) but VOCs are being added to specific SCCs in 2014NEIv2. Should this VOC be kept in the ag sector or in nonpt? Ammonia is important to PM / regional haze and could deserve special attention. Ammonia cycles are complex and CMAQ has some special capabilities for dealing with ammonia including bi-directional ammonia modeling for fertilizer emissions, and special temporal allocation of ammonia from livestock that considers meteorological parameters.
- **Portable Fuel containers (PFC)**
- **Refueling (Stage 1):** While Stage 1 refueling is in nonpoint, Stage II refueling emissions are estimated as part of running MOVES for onroad and are a function of activity and fuel properties, so these are kept in the onroad sector.
- **Residential Wood Combustion (RWC)**
- **Other Nonpoint:** Many other types of sources are included in this sector.

Nonpoint Workgroup Tasks:

- **General:** The workgroup will need to decide whether to use the 2014 emissions reported for each subsector directly as 2016 or to project them in some way.
- **Point / nonpoint source reconciliation:** If we end up using 2016 for point and 2014 for nonpoint, point/nonpoint reconciliation will be difficult. At a minimum there should be a check along these lines.
- **Afdust:** In recent platforms, EPA has grown paved and unpaved road dust linearly with VMT projections. The workgroup could consider whether this is appropriate for continuing to project dust.

- **Agricultural:** In recent platforms, EPA has grown ammonia from livestock proportionally with projected livestock populations in future years. EPA has recently researched alternative sources for future livestock population data which can be specified. Fertilizer emissions have not been projected in recent EPA platforms.
- **Portable Fuel containers:** In recent platforms, EPA has projected PFC emissions but work is needed to update the approach. The workgroup should work with EPA's Office of Transportation and Air Quality (OTAQ) to consider updated methods for projecting PFC emissions.
- **Refueling:** This workgroup should coordinate with OTAQ on methods for handling refueling emissions.
- **Residential Wood Combustion (RWC):** RWC emissions are important to PM and haze. Additional information about RWC usage may become available in the coming year. EPA has existing methods that represent the change in RWC appliance use and the impacts of changeovers to cleaner appliances and the impacts of rules like NSPS. These methods should be reviewed and considered in light of any new information. State-specific issues should be considered. Temporal and spatial allocation of RWC sources should be reviewed and potentially PM and VOC speciation.
- **Other Nonpoint:** EPA has existing methods to estimate changes in activity for specific subcategories and the impacts of national and some state rules. These methods should be reviewed and considered in light of any new information. State-specific issues should be considered. The diverse nature of the sources makes this a challenging sector.

Onroad

Workgroup Staffing Recommendations: Co-leads will be Julie McDill of MARAMA and Alison Eyth of EPA. There will be additional EPA participation from OAQPS and OTAQ. A new workgroup will be established with MJO and EPA chairs to handle Onroad - a smaller WG than the current MJO MOVES.

Available onroad data: 2014 onroad emissions will be available in 2014NEIv2 by the end of 2017. 2016 onroad emission factors based on CDBs compatible with 2014NEIv2 will also be available at that time. Draft 2016 onroad emissions may be available before the end of the year. The onroad team at EPA will work to provide documentation on the development of the CDBs and the activity data before the end of the year (sooner, if possible).

Onroad workgroup tasks: The workgroup should review the available 2016 onroad emissions and activity data compatible with 2014NEIv2 along with the documentation on how the emission factors and activity data were developed. Note that the 2014v2 CDBs used CRC A-100 and other data sets as inputs. As part of the review, the workgroup should consider the following items:

- 1) the distribution of hoteling hours as compared to known truck stops;
- 2) improving the development of heavy-duty VMT and VPOP data and best practices that could be communicated to states on this topic;
- 3) whether VIN decoding for 2016 would be useful;

4) are the HD age distributions from the 2014 VIN decoding usable for 2016 (the MCMIS database could be helpful here) and what is appropriate VMT for the 61s and 62s.

EPA will provide documentation for the 2016-compatible emissions in the November / early December timeframe. We expect updates to activity data from interested states, but whether the 2016 MOVES EFs need to be recreated is TBD.

Upcoming: EPA will describe the data included in 2014NEIv2 (and the corresponding 2016) to MJO MOVES in November.

Nonroad

Workgroup Staffing Recommendations: Sarah Roberts (EPA OTAQ) will be the EPA co-lead; others from OAQPS and OTAQ will be members. No MJO/state co-lead has yet volunteered.

Available nonroad data: 2014 nonroad emissions will be available in 2014NEIv2 by the end of 2017. 2016 nonroad emissions compatible with 2014NEIv2 revised inputs will also be available at that time.

Nonroad workgroup tasks: The workgroup should review the available **2016** nonroad emissions that are compatible with 2014NEIv2. As presented at the September MOVES Review workgroup, EPA has been working to update nonroad vehicle populations and assessing the impact of those updates on emissions. The workgroup should work with EPA and states that may have local population data to assess whether updated population estimates could be incorporated into the 2016 platform. In addition, the workgroup should work with EPA and states to review the nonroad model's Mining and Oil Field Equipment SCCs to determine if these SCCs should be omitted or reassigned to other sectors (e.g., non-EGU point, nonpoint oil and gas).

Marine

Workgroup Staffing Recommendations: Mark Janssen will be the MJO co-lead and an OTAQ designee will be the EPA co-lead.

Available marine (cmv) data: 2014 Commercial Marine Vessel (CMV) emissions will be available in 2014NEIv2 by the end of 2017. The CMV emissions in 2014NEIv1 were developed using a new bottom-up approach. In 2014NEIv2, the CMV emissions from the LADCO special study were incorporated for the Great Lakes and some surrounding states. In 2017, EPA developed a new spatial surrogate to better allocate CMV emissions into shipping lanes - this surrogate could be improved to have separate versions for c1c2 and c3 CMV sources. In the 2011en platform, changed the treatment of C3 ships so that it could consider plume rise.

Marine (cmv) workgroup tasks: To improve 2016 CMV data, a workgroup will be formed to work with DOT and stakeholders to duplicate the LADCO/ENERCON methodology of integrating AIS transponder ship locations into high spatial and temporal resolution emissions inventories. It is our

hope that we build a tool that automates a significant portion of the process so that future emissions inventories can be constructed easily. Since spatial processing is a such a critical component of the process of using AIS data and processing massive databases like the AIS data through ESRI's ARC/INFO has proven to be problematic because of the size it is preferential to use the GIS capabilities of R or Python to create the tool use to calculate emissions.

The tool should also provide capabilities to have vessel specific fuel, horsepower, fuel consumption, duty cycle, and emission rate information. Since 2017 vessel information may be needed for the LADCO LMOP study and the NEI there will be an attempt to process 2017 shipping information for the 2017 inventory. The two primary products are a link level inventory of all marine vessels able to be processed through SMOKE with the updated UNC LINK tool and a county based monthly inventory summary for use in SIPS and the NEI.

The workgroup should consider whether the currently employed stack parameters for C3 ships used to compute plume rise are still the best available estimates and whether spatial surrogates need additional improvements as link-level processing could prove to be too intense for all CMV modeling.

For projecting to future years, the currently available methods for CMV projections both within and outside of US waters should be reviewed.

Rail

Workgroup Staffing Recommendations: Mark Janssen will be the MJO co-lead and Sarah Roberts will be the EPA co-lead.

Available rail data: 2014-specific rail (locomotive) emissions will be available in 2014NEIv2 by the end of 2017. These emissions were developed by the ERTAC rail committee and used updated data sources for 2014.

Rail workgroup tasks: The current ERTAC committee will extend its task of creating a 2014 emissions inventory to include 2016. Line haul methodologies will duplicate the 2014 inventory. In the development of the 2014 rail inventory it was identified that past methodologies for yards are increasingly problematic with too many yards being identified and larger significant yards being under estimated. The project will work with states and rail companies to improve yard related activities.

Since 2017 rail information will be needed for the NEI there will be an attempt to process 2017 rail information for the 2017 inventory. The two primary products are a link level inventory of all line haul links and pseudo links for yards able to be processed through SMOKE with the updated UNC LINK tool and a county based monthly inventory summary for use in SIPS and the NEI. Note: Coordination is needed on link-based formats as a new format is available in addition to the slightly

older link tool referenced above. UNC should educate the community on the pros/cons of each format.

For projected years, the currently available methods for projecting emissions from locomotives should be reviewed.

Canada Emissions

Workgroup Staffing Recommendations: The non-US emissions for Canada will be covered under the overall coordination committee unless it is determined that a separate workgroup is needed.

Available Canada data: Environment Canada provided EPA with Canadian emission estimates for 2013 and 2025. EPA has formatted the inventories and processed these data for modeling cases including any updated spatial surrogates and temporal profiles. EPA can provide scripts and data that can be input into SMOKE for sectors that use Canadian emissions.

Workgroup tasks: The workgroup should consider whether it is appropriate to interpolate the inventories to get emissions for years other than 2013 and 2025.

Mexico Emissions

Workgroup Staffing Recommendations: The non-US emissions for Mexico will be covered under the overall coordination committee unless it is determined that a separate workgroup is needed.

Available Mexico data: EPA worked with ERG to develop several years of estimated emissions for Mexico: 2011, 2014, 2018, 2025 and 2030 (for point/nonpoint) based on projections from Mexico's 2008 inventory. Onroad mobile source emissions for Mexico based on MOVES-Mexico are available for 2011, 2014, 2017, 2020, 2023, and 2028. EPA has formatted the inventories and processed these data for modeling cases including any updated spatial surrogates and temporal profiles. EPA can provide scripts and data that can be input into SMOKE for sectors that use Mexican emissions and could interpolate emissions to 2016. EPA is currently working with some updated nonpoint emissions provided by Mexico for 2013/14 and can provide this information once it is formatted into emission inventories although projections off of this data year will not be available.

Workgroup tasks: The workgroup should consider appropriate inventories to use to model 2016 and future years in Mexico, how updated emissions could be reasonably projected to future years, and whether further updates to emissions from Mexico could be identified and incorporated (e.g., for point sources).