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EPA's 2020 Nonpoint Oil and Gas Emissions Estimation Tool Updates

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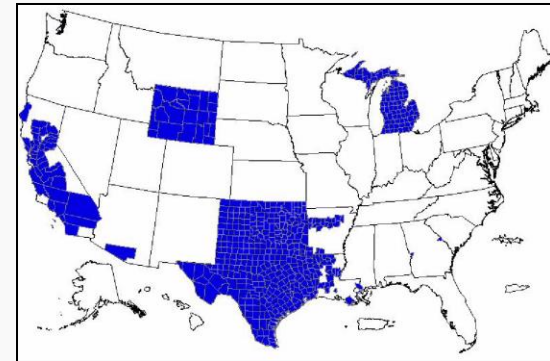


EPA Oil and Gas Emission Estimation Tool

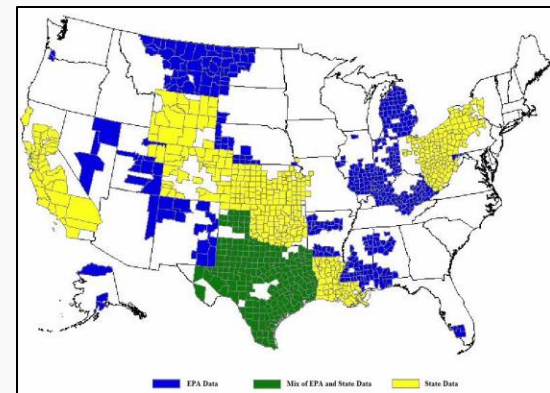
- Access-based emissions estimation calculator
 - County-level activity data
 - County-level process characterization data
 - Emission factors
 - Generates county-level emission estimates by source classification code (SCC)
 - EIS export to National Emission Inventory (NEI)
- State application
 - Portable
 - User-defined inputs
- EPA application
 - Gapfill NEI where no state data available

Tool/NEI Evolution

- 2008 Nonpoint NEI
 - State-provided data for 8 states
 - No EPA gap-filling
 - No nonpoint emissions for many producing states



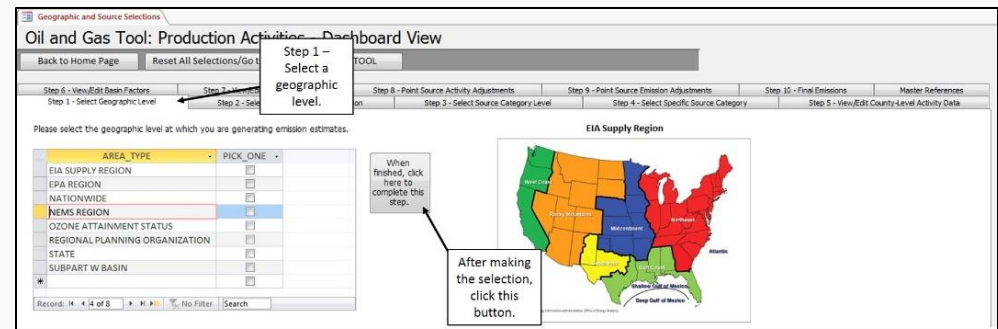
- 2011 Nonpoint Tool/NEI
 - Tool developed based on CenSARA and TCEQ methodologies
 - Utilized existing EPA, state, and regional data (WRAP, CenSARA)
 - County-level activity and emissions compiled for entire US
 - Used to gap-fill NEI where no state data reported



Tool/NEI Evolution

- 2014 Tool Improvements

- Enhanced user interface
- Updated activity analysis
- Emission factor updates
- Utilized Greenhouse Gas Reporting Program (GHGRP) Subpart W data



- 2017 Tool Improvements

- Added Vapor Recovery Units (VRUs)
- Added capability to include coal-bed methane dewatering pump
- GHGRP Subpart W data updates
- Emission factor updates
- Basin factor updates (gas composition, process data from WV permits, etc.)



2020 Tool/NEI

- 2020 Tool Improvements
 - GHGRP Subpart W data updates
 - Associated Gas emission updates
 - Miscellaneous updates:
 - Non-road engine emission factors
 - Incorporated WRAP process characterization/inventory data
- 2020 NEI
 - Blowdowns (done outside the Tool using GHGRP data)
 - State data assessment/adjustments
 - Pennsylvania
 - Oklahoma
 - New Mexico



GHGRP Subpart W Updates

- Expanded reporting requirements
 - Evolving program year over year
 - Limited data used in 2011 Tool
 - Significant updates for 2014 Tool
 - Additional updates for 2017 and 2020 Tools
- 2020 Subpart W Reporters
 - ~470 facilities reporting under Subpart W
 - 486,923 wells
 - 37 basins
 - 1,325 sub-basins (county + formation type)



GHGRP Subpart W Updates

- **2020 Tool Updates**
 - Associated Gas Venting and Flaring (fraction flared)
 - Condensate Tanks (VRU and flaring fraction)
 - Crude Oil Tanks (VRU and flaring fraction)
 - Dehydrators (number per well)
 - Fugitives (component counts)
 - Heaters (number per well)
 - Pneumatic Devices (number of low, intermittent, and high-bleed devices per well)
 - Wellhead Compressor engines (number per well)



Associated Gas Emissions

- Venting/flaring of gas produced from oil wells where no gas collection infrastructure available
- US Energy Information Administration data on quantities of gas vented/flared
 - Covers 9 states representing 87% of oil production
 - 0.15 (MCF/BBL) gas vent rate
- US GHGRP data on fraction of gas flared
 - 98% of gas flared





Blowdowns

- UT Division of Air Quality Methodology
- CH₄ emissions reported under the GHGRP
 - Compressors
 - Emergency shutdowns
 - Facility piping
 - Pig launchers and receivers
 - Pipeline venting
- Tool gas composition data used to derive VOC and HAP emissions from CH₄ emissions
- 23,929 tpy VOC
- Methodology/estimates developed outside of the Tool

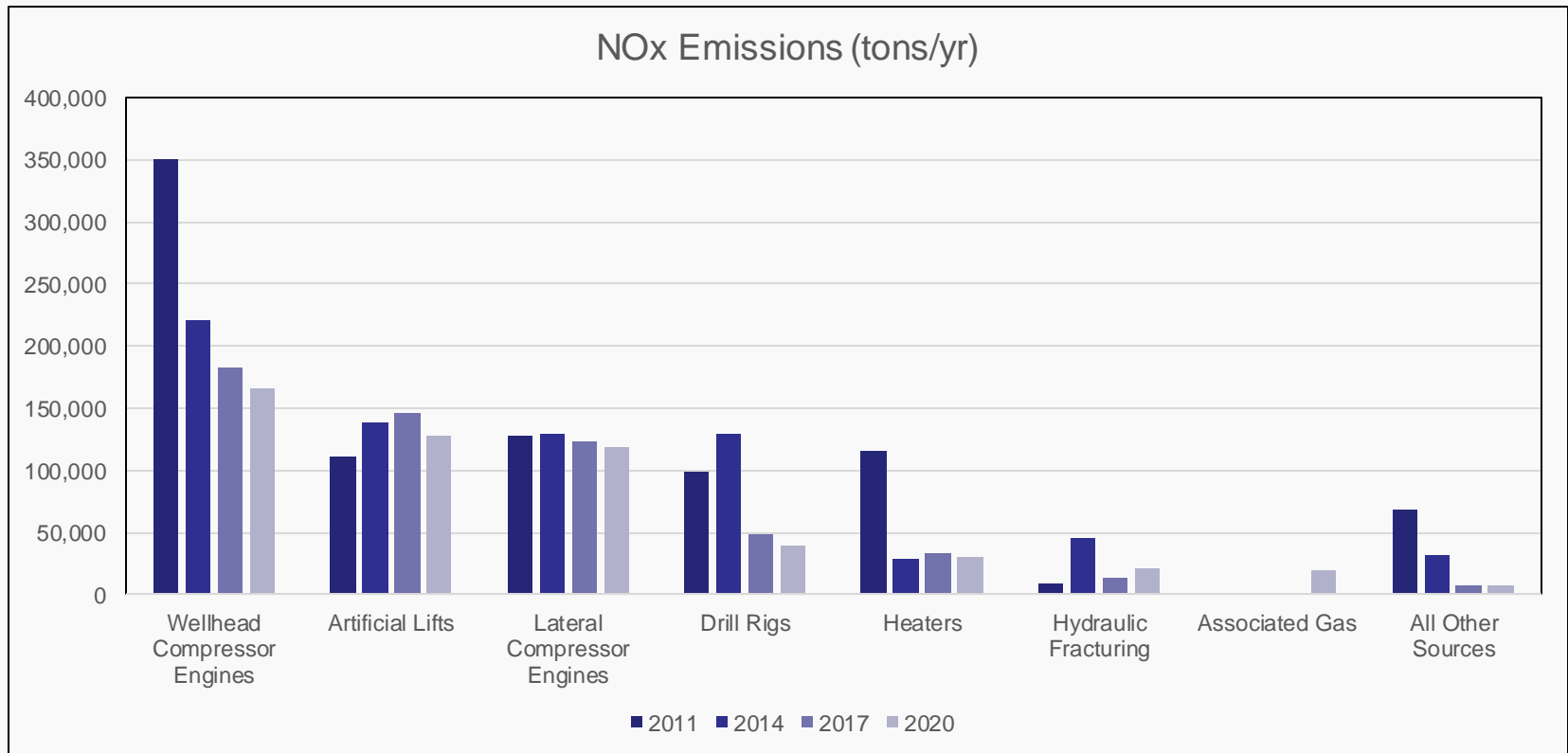


State Data Incorporation

- Pennsylvania
 - PADEP collects emissions data from unconventional (e.g. hydraulically fractured) wells and associated equipment
 - Tool estimates reduced by subtracting unconventional well activity/production prior to NEI inclusion
- Oklahoma
 - OKDEQ point sources include upstream facilities with processes covered by the Tool
 - Tool estimates reduced by subtracting point source activity/production prior to NEI inclusion
- New Mexico
 - Minor oil and gas source data collected for 2020 for over 2,000 sources and reported to NEI as point sources
 - Tool estimates reduced by subtracting point source emissions prior to NEI inclusion

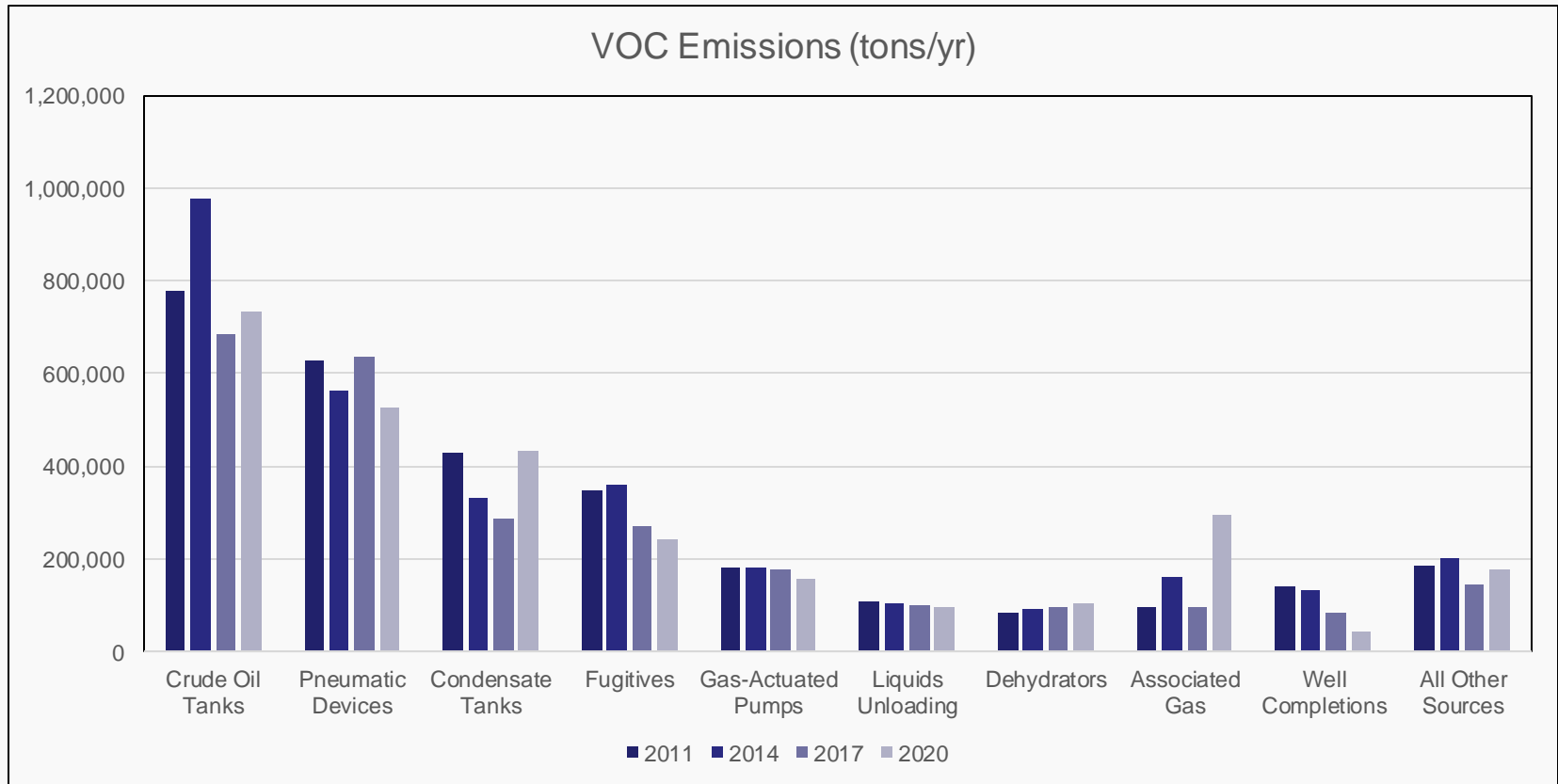


Tool Results - NOx





Tool Results - VOC





Improvements Planned for 2023

- Addition of geographic resolution for tribal areas
 - Allows for EIS output for tribal inventories
 - Tribal production currently allocated to county/state
- Abandoned/orphaned well estimates
 - Based on EPA GHG Emissions Inventory methodology (activity, CH₄ emission factors)
 - Disaggregated to the county-level
 - Enverus data used where available
 - 2020 Tool well distribution where Enverus data not available
 - Tool gas composition data used to get from CH₄ to VOC/HAP



Questions?

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