To: Visibility Improvement - State and Tribal Association of the Southeast (VISTAS) Region Team

From: North Carolina Division of Air Quality (NCDAQ)

Date: December 7, 2018

Subject: Southeastern VISTAS II Regional Haze Project:
Documentation of 2028 Mass Emissions Inventory for Small Electricity Generating Units (EGUs) for States not included in the VISTAS II Region

Introduction

The VISTAS II regional haze modeling platform for 2028 started with U.S. Environmental Protection Agency's (EPA) 2028v6.3el modeling platform.[1] For EGUs, the 2028 emissions were projected from the base year 2011 using the Integrated Planning Model (IPM) that included the Clean Power Plan (CPP); however, EPA did not implement the CPP. Therefore, for the VISTAS II project, the Coordinating Committee (CC) and Technical Analysis Work Group (TAWG) agreed to replace the IPM forecast for 2028 with the 2028 emissions forecast produced by the Eastern Regional Technical Advisory Committee (ERTAC) EGU forecast tool (referred to as the 2028 ERTACv2.7 EGU inventory). The 2028 ERTACv2.7 EGU inventory was projected from a 2011 base year, geographically covers the continental United States, and excludes the CPP.

The ERTAC tool includes EGUs that burn fossil fuel with ≥25 megawatts (MW) of generation capacity or ≥250 million British thermal units per hour (MMBtu/hr) of heat input, and generate electricity for the power grid. IPM includes the same fossil fuel units as those included in ERTAC, plus small EGUs with <25 MW of generation capacity or <250 MMBtu/hr of heat input and may or may not produce electricity for the power grid. Therefore, it was necessary to develop a 2028 projection year inventory for the small EGUs that are included in IPM but not in ERTAC to include in the VISTAS II modeling platform to ensure complete accounting of emissions from small EGUs. See the attachment to this memorandum for additional information comparing EGU coverage by IPM versus the ERTAC forecast tool.

For the VISTAS II 2028 inventory, the following five files were developed for small EGUs:

- Revised Ozone Transport Commission (OTC)/Mid-Atlantic Regional Air Management Association, Inc. (MARAMA) file: The small EGU file developed by OTC/MARAMA for the OTC modeling platform was modified to remove the VISTAS states and double counting of some emissions sources included in the 2028 ERTACv2.7 inventory.[2]

[1] Technical Support Document (TSD), Updates to Emissions Inventories for the Version 6.3, 2011 Emissions Modeling Platform for the Year 2028, EPA, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, October 2017, https://www.epa.gov/air-emissions-modeling/updates-2011-and-2028-emissions-version-63-technical-support-document.

[2] Obtained from Eric Zalewsky, New York State Department of Environmental Conservation (NYSDEC), and Susan McCusker, MARAMA via a MARAMA's Sharefile FTP site on September 13, 2018. File name = 2023_POINT_PTNONERTAC_IPM_29may2017_02jun2017_v0.csv.

- Small EGU Inventory for 14 Western States: Two files (one for summer and the other for winter emissions) that cover small EGUs in 14 western states not included in the OTC/MARAMA small EGU inventory file. The data in these files originate from EPA's 2023v6.3en modeling platform.
- Small EGUs in the Eastern and Mid-Western U.S. not included in the ERTACv2.7 and the OTC/MARAMA Small EGU Inventories: Two files (one for summer and the other for winter emissions) that cover units in the eastern and mid-western U.S. that appear in the EPA 2023v6.3en modeling platform and are anticipated to be operating in 2028, but are missing from 2028 ERTACv2.7 and the OTC/MARAMA small EGU files.

Note that for the 2023v6.3en EGU inventory, EPA applied an engineering analysis to develop future year 2023 emissions for EGUs that reported NOx and/or SO_2 continuous emissions monitoring (CEM) data to EPA. For EGUs not reporting CEM data to EPA, EPA relied on its IPM forecast projected from 2011. The small EGUs included in these files most likely represent a mixture of EGUs to which EPA applied its engineering analysis versus relying on its IPM forecast to prepare the 2023 inventory. See EPA's technical support document for "Additional Updates to Emissions Inventories for the Version 6.3, 2011 Emissions Modeling Platform for the Year 2023" for details.[3]

Table 1 identifies the small EGU emissions data files developed for the VISTAS II 2028 regional haze modeling platform and identifies the states covered by the files. The data for all 5 files originate from EPA's IPM forecast for 2023 that EPA used in its 2011/2023v6.3en modeling platform, which excludes the CPP. For the VISTAS II project, small EGU emissions were not projected from 2023 to 2028 because, in general, emissions associated with small EGUs are not expected to change significantly by 2028. In addition, time and resource constraints prohibited developing growth factors for these small EGUs. Therefore, 2023 emissions were assumed to be representative of 2028 emissions.

The remainder of this memorandum documents how the 2028 small EGU inventory was prepared for the three sets of files for the non-VISTAS states, including quality assurance (QA) review of the inventory. Note that for the VISTAS states, each state reviewed its EGU inventory and provided the contractor with direction on how to update its 2028 EGU inventory to exclude the CPP. The methodologies for the VISTAS states are documented in the Task 2 report from the VISTAS contractor.[4] The focus of this inventory effort is on the following pollutants: sulfur dioxide (SO_2), oxides of nitrogen (NOx), volatile organic compounds (VOC), primary particulate matter with an aerodynamic diameter $\leq$10 and $\leq$2.5 micrometers (PM10-PRI and PM2.5-PRI), ammonia (NH_3), and carbon monoxide (CO).

[3] Technical Support Document (TSD), Additional Updates to Emissions Inventories for the Version 6.3, 2011 Emissions Modeling Platform for the Year 2023, U.S. Environmental Protection Agency, Office of Air and Radiation, Office of Air Quality Planning and Standards, Air Quality Assessment Division, October 2017., https://www.epa.gov/sites/production/files/2017-11/documents/2011v6.3_2023en_update_emismod_tsd_oct2017.pdf

[4] Southeastern VISTAS II Regional Haze Analysis Project –Task 2 Emission Inventory Updates Report, Prepared for Southeastern States Air Resource Managers, Inc., 205 Corporate Center Drive, Suite D, Stockbridge, GA 30281-7383 under SESARM Contract No. V-2018-03-01, prepared by Eastern Research Group, Inc., 1600 Perimeter Park Drive, Suite 200, Morrisville, NC 27560, REVISED FINAL – August 28, 2018. The VISTAS states include AL, FL, GA, KY, MS, NC, SC, TN, VA, and WV. The Eastern Band of Cherokee Indians and the Knox County, Tennessee local air pollution control agency are also participating agencies in VISTAS.

Table 1. Small EGU Emissions Data Files Developed for the VISTAS II 2028 Regional Haze Modeling Platform

File Name	Description	Nature of Revisions
Revised OTC/MARAMA Small EGU Inventory		
nonERTAC_sources_outsideVISTAS _outsideWEST_20181008_ff10.csv	Contains small EGUs for the following 25 eastern and mid-western states: AR, CT, DE, IL, IN, IA, KS, LA, ME, MD, MA, MI, MN, MO, NE, NH, NJ, NY, OH, OK, PA, RI, TX, VT, and WI	Removed facilities and emission units that were identified in the 2028 ERTACv2.7 inventory. Removed data for VISTAS States (AL, FL, GA, KY, MS, NC, SC, TN, VA, and WV). Note that Florida was not included in the original file obtained from OTC/MARAMA.
Small EGU Inventory for Western States		
West_nonERTAC_egu_summer_ff10.csv[1]	Contains small EGUs for the following 14 western states: AZ, CA, CO, ID, KS, MT, NE, NV, NM, OR, SD, UT, WA, and WY. Note that ND did not contain any small EGUs.	These are new files created for the VISTAS II regional haze modeling platform.
West_nonERTAC_egu_winter_ff10.csv[2]		
Additional Small EGU Facilities Missing from the ERTACv2.7 and the OTC/MARAMA Small EGU Files		
Additional_2023en_sources_nonERTAC _egu_EASTUS_summer.csv[1]	Contains small EGUs for the following 19 states: AR, CT, IL, IN, IA, LA, ME, MD, MA, MI, MN, MO, NH, NJ, NY, OH, OK, PA, and TX.	These are new files created for the VISTAS II regional haze modeling platform.
Additional_2023en_sources_nonERTAC _egu_EASTUS_winter.csv[2]		

[1] The annual emissions column in this "summer" file reflects the sum of monthly emissions in the file for May through September.

[2] The annual emissions column in this "winter" file reflects the sum of monthly emissions in the file for January through April plus October through December.

Small EGU Inventory Developed for the Eastern U.S.

OTC/MARAMA jointly prepared a 2028 projection year inventory to support regional haze modeling.[5] For EGUs, OTC/MARAMA used the 2028 ERTACv2.7 forecast and developed an inventory for the small EGUs included in the IPM but not the ERTAC forecast. This inventory included small EGUs in the states covered by the OTC modeling domain and the states bordering the western and southern boundary (excluding FL) of the OTC modeling domain.

The NCDAQ revised the OTC/MARAMA small EGU file by first removing facilities located within VISTAS states (AL, GA, KY, MS, NC, SC, TN, VA, and WV) because the VISTAS states provided updated emissions to the contractor.[6]

[5] Ozone Transport Commission/Mid-Atlantic Northeastern Visibility Union 2011 Based Modeling Platform Support Document – October 2018, Project Manager: Joseph Jakuta, Contributors: Michael Ku, Joseph Jakuta, David Healy, Michael Woodman, Kurt Kebschull, Update, October 18, 2018. See page B-176 for identification of small EGU file names. https://otcair.org/MANEVU/Upload/Publication/Reports/OTC%20MANE-VU%202011%20Based%20Modeling%20Platform%20Support%20Document%20October%202018%20-%20Final.pdf.

[6] Note that Florida was not included in the original small EGU file obtained from OTC/MARAMA because FL is outside of the OTC modeling domain.

The NCDAQ then compared the location of facilities in the OTC/MARAMA small EGU file and the ERTACv2.7 file. The comparison involved a two-step process. First, facilities were mapped in ArcGIS to identify facilities with coordinates in the two files that were less than 2 miles apart. Then, facilities outside of this geographic overlap were checked via the facility_id, unit_id, rel_point_id, and process_id to identify any duplicate sources between the two files. This QA check identified two large-emitting facilities in TX, two in MI, and one in OH, plus several small-emitting facilities in other states that were duplicates and removed from the OTC/MARAMA small EGU file. Table 2 lists the facilities located in non-VISTAS states that were removed from the file OTC/MARAMA small EGU file. Table 3 provides a summary of annual emissions by non-VISTAS state contained in the revised OTC/MARAMA small EGU inventory for 2028.

Table 2. Facilities and Emissions Removed from the OTC/MARAMA Small EGU file in for Non-VISTAS States

Facility	State	Facility ID	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
Associated Electric COOP Inc-Dell Pwr Pl	AR	10642211	0	3	0	0	0	0	5
Central Iowa Power COOP - Summit Lake	IA	3731711	0	43	0	1	1	1	10
Western Minnesota Municipal Power Agency	IA	9661311	0	4	0	0	0	0	2
Ameren Energy Generating Co	IL	2622911	0	12	1	2	2	0	9
Ameren Services	IL	9686711	0	21	5	5	5	0	44
Ameren UE	IL	1945711	0	5	2	2	2	0	19
City Water Light & Power	IL	4541611	0	0	0	0	0	0	0
Crete Energy Park	IL	4106911	0	2	0	1	1	0	3
Exelon Generation Co LLC	IL	9725911	0	3	0	1	1	0	1
Holland Energy LLC	IL	9698311	1	29	0	13	13	0	2
Lee Energy Facility	IL	5483011	0	1	0	0	0	0	1
NRG Rockford Energy Center	IL	9698111	0	10	0	1	1	0	2
Southern Illinois Power Coop	IL	8164511	0	4	0	0	0	0	0
CLECO Power LLC - Teche Power Station	LA	7204011	0	14	7	18	18	0	6
Louisiana Generating LLC - Big Cajun 1 Power Plant (Steam)	LA	5931611	0	1	0	0	0	0	0
Cadillac Renewable Energy Facility	MI	6180011	93	273	10	39	34	15	467
DTE - Electric Company Delray Power Plant	MI	7306011	0	5	0	1	1	0	1
Grayling Generating Station LTD PTNR	MI	4187811	19	308	6	16	16	0	566
Great River Energy - Cambridge	MN	6167711	0	23	1	0	0	0	11
Hutchinson Utilities Commission -Plant 2	MN	7626711	0	0	0	0	0	0	0

Facility	State	Facility ID	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
LSP Cottage Grove Cogeneration Facility	MN	6785711	1	11	0	0	0	0	41
Xcel Energy - Riverside Generating Plant	MN	6393811	2	68	1	1	1	21	112
City Utilities of Springfield Missouri-John Twitty Energy Center	MO	7496411	0	2	0	0	0	0	1
City Utilities Of Springfield-N L McCartney Dist Generation	MO	7498011	0	8	0	0	0	0	7
Lon D Wright Power Plant	NE	7766111	0	0	0	0	0	0	0
Holtsville Gt Facility	NY	8452411	0	14	0	1	1	0	0
Ogdensburg Energy Facility	NY	7968011	0	10	1	1	1	0	8
Buckeye Power Greenville Station (0819070237)	OH	8257111	0	12	0	0	0	0	17
Smart Papers - Hamilton Mill	OH	7920911	558	108	1	16	10	0	43
Allen Fossil Plant	TN	5720111	0	7	0	0	0	0	0
E I. Dupont De Nemours & Co Inc	TN	6516311	0	52	2	3	3	0	8
Powell Valley Electric Cooperative, Inc.	TN	3787211	0	0	0	0	0	0	0
TVA Bull Run Fossil Plant	TN	6196011	0	0	0	9	3	0	0
TVA Cumberland Fossil Plant	TN	4979311	0	0	0	19	10	0	0
TVA Gleason Combustion Turbine Plant	TN	3428511	0	0	0	0	0	0	0
TVA Johnsonville Fossil Plant	TN	5720911	0	65	2	5	5	0	13
Bastrop Energy Center	TX	3981411	0	0	0	0	0	0	0
Channelview Cogeneration Facility	TX	4057511	18	314	27	146	146	88	167
Fayette Power Project	TX	4144811	2,196	396	4	70	38	43	125
Graham Steam Electric Station	TX	8532511	0	91	2	3	3	2	31
Handley Steam Electric Station	TX	4916711	0	12	2	3	3	0	2
Harrington Station Power Plant	TX	5745311	16,196	5,152	109	1,342	172	55	3,079
Jones Station Power Plant	TX	4030611	0	10	1	2	2	0	6
Laredo Power Station	TX	5023911	0	6	1	2	2	1	3
Leon Creek Plant	TX	3000111	0	12	0	4	4	0	15
Mountain Creek Steam Electric Station	TX	5729911	0	42	2	2	2	2	8
Mustang Electric Station	TX	5129311	0	3	1	1	1	0	2
Plant X Power Plant	TX	4946011	1	130	7	9	9	4	30
Sabine Plant	TX	5730811	4	998	33	46	46	0	145
Sand Hill Energy Center	TX	9071611	0	6	2	2	2	0	29
Silas Ray Power Plant	TX	6493311	0	8	0	0	0	0	1
South Texas Electric Coop	TX	5863011	1	19	3	9	9	5	22
SR Bertron Station	TX	4941311	1	126	5	7	7	3	11
Stryker Creek Electric Station	TX	5729511	1	110	6	8	8	5	34

Facility	State	Facility ID	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
VH Braunig Plant	TX	5616511	0	15	2	4	4	9	7
WA Parish Electric Generating Station	TX	3968411	1	272	7	10	10	6	50
WI Public Service Corp - JP Pulliam Plant	WI	5295111	1	11	2	2	2	0	1
Wisconsin Public Service Corp - De Pere Energy Center	WI	7642611	0	15	0	0	0	0	1
Totals			**19,094**	**8,866**	**255**	**1,827**	**599**	**260**	**5,168**

Table 3. Revised OTC/MARAMA Small EGU Inventory: Summary of Annual Emissions by Non-VISTAS State

State	No. Facilities	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
AR	10	0	118	1	3	3	0	31
CT	8	65	96	7	22	21	18	96
DE	2	1,317	411	5	94	89	1	18
IA	47	2,941	1,066	53	104	74	25	205
IL	23	20,892	4,480	59	696	409	1	1,015
IN	20	5,534	10,893	48	1,305	1,163	1	649
KS	5	6	39	0	1	1	0	10
LA	22	148	7,841	218	920	912	36	2,453
MA	21	765	4,473	78	93	83	135	928
MD	3	4	29	0	0	0	0	0
ME	21	677	2,777	91	87	83	20	3,810
MI	62	5,532	5,874	65	282	180	9	2,496
MN	43	4,565	8,433	222	756	481	398	2,758
MO	45	8,872	2,779	25	552	485	10	226
NE	10	1	4	10	1	0	0	1
NH	7	41	614	24	62	56	16	728
NJ	11	19	358	19	29	29	2	38
NY	59	731	5,542	92	198	136	64	1,351
OH	21	17,770	3,047	50	994	975	5	491
OK	8	0	4	0	7	7	0	1
PA	67	9,319	8,987	153	649	485	61	2,072
RI	1	0	1	0	0	0	0	0
TX	95	127	2,959	344	842	833	130	1,189
VT	2	3	332	21	3	2	16	1,376
WI	14	1,071	1,200	62	200	183	7	614
Totals	**627**	**80,400**	**72,357**	**1,647**	**7,900**	**6,690**	**955**	**22,556**

Small EGU Inventory for Western States in the Continental United States

For the non-VISTAS states, the OTC/MARAMA inventory excluded small EGUs in 14 western states (i.e., AZ, CA, CO, ID, KS, MT, NE, NM, NV, OR, SD, UT, WA, and WY). The OTC/MARAMA file included small EGUs; however, the NCDAQ identified a few small EGUs in NE and KS that were missing from the OTC/MARAMA small EGU file. The OTC/MARAMA did not include small EGUs in ND, and the NCDAQ confirmed that there were no small EGUs in ND.

To generate the small EGU files for the western states, first the NCDAQ generated a list of facilities from EPA's 2023v6.3en "ptegu" file that did not overlap within 2 miles with facilities in the 2028 ERTACv2.7 file.[7] Then these western state facilities/units were compared to facilities/units found in the revised OTC/MARAMA file and in the ERTACv2.7 file to check for duplicate sources with a matching facility_id, unit_id, rel_point_id, and process_id. Any duplicates were removed from the western small EGU files. Finally, a check for facility and unit closures was made for SO_2 sources with ≥100 tons per year. Any facilities or emission units that would be closed by 2028 were removed from the file. Table 4 provides a summary of annual emissions by non-VISTAS state contained in the western states small EGU inventory for 2028.

Table 4. Small EGU Inventory for Western States File: Summary of Annual Emissions by Non-VISTAS State

State	No. Facilities	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
AZ	4	67	256	3	83	83	0	330
CA	78	2,198	5,795	433	948	816	770	13,558
CO	12	2,086	1,608	96	104	103	0	273
ID	4	93	1,299	185	134	118	0	4,139
KS	19	2	397	24	7	7	0	144
MT	3	3,129	1,360	16	84	75	0	34
NE	41	6	83	4	119	47	0	16
NM	4	0	1	0	1	1	0	2
NV	1	5	272	23	41	22	48	69
OR	9	606	2,177	111	508	421	46	2,280
SD	2	3	19	0	4	3	0	2
UT	10	1,559	876	22	54	45	11	155
WA	8	355	1,654	79	76	62	47	2,264
WY	1	0	6	1	4	4	2	10
Totals	**196**	**10,109**	**15,803**	**997**	**2,167**	**1,807**	**924**	**23,276**

Small EGUs in the Eastern and Mid-Western U.S. Missing from the ERTACv2.7 and the OTC/MARAMA Small EGU Inventory Files

For the non-VISTAS states, using ArcGIS, the NCDAQ identified sources in the IPM 2023en "ptegu" files that were not within 2 miles of any sources found in the 2028 ERTACv2.7 inventory file, revised OTC/MARAMA small EGU file, the western states small EGU file, or the non-EGU point source inventory. Sources with SO_2 emissions greater than 100 tons were checked to see if they would be shut down by 2028. This check identified one facility in IN (Duke Energy Gallagher) and one facility in MI (DTE Trenton Channel Power) that would be shut down by 2028. Therefore, these two facilities were removed from the small EGU inventory files. Table 5 provides a summary of annual emissions by non-VISTAS state contained in the additional sources small EGU inventory for 2028.

[7] The NCDAQ discovered a few facilities that had different names and/or facility IDs in EPA's 2023v6.3en "ptegu" file versus the ERTAC 2028 EGU file. As a result, the NCDAQ chose geographic screening within 2 miles as the primary step in creating the western non-ERTAC small EGU files.

Table 5. Small EGUs in the Eastern and Mid-Western U.S. not in ERTACv2.7 and OTC/MARAMA Small EGU Inventories: Summary of Annual Emissions by Non-VISTAS State

State	No. Facilities	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO
AR	1	87	315	1	48	27	0	6
CT	5	119	939	13	5	2	6	151
IA	5	1	91	1	2	2	2	10
IL	3	127	321	8	23	22	17	70
IN	6	30	248	36	76	71	80	333
LA	2	3,841	72	1	56	33	2	7
MA	3	0	0	0	0	0	0	0
MD	3	6	68	0	0	0	0	8
ME	1	353	507	65	13	6	3	985
MI	5	0	12	0	0	0	0	1
MN	5	0	41	0	1	1	1	4
MO	1	0	1	0	0	0	0	0
NH	5	23	476	58	95	73	86	1,777
NJ	8	41	866	6	30	24	5	104
NY	3	0	1	0	0	0	0	0
OH	5	23	207	31	64	60	68	281
OK	2	0	767	29	156	81	10	1,590
PA	7	3	54	0	1	1	0	2
TX	8	12	941	39	81	43	43	368
Totals	**78**	**4,666**	**5,927**	**288**	**651**	**446**	**323**	**5,697**

Quality Assurance

Each of the output files was compared to each other, and each file was also compared to the 2028 ERTACv2.7 file and the 2028v6.3el "ptnonipm" file. The comparison checked for any geographic overlap of less than 2 miles, and check for duplicate Facility ID and Unit ID entries. Any units that overlap or were duplicates were checked and removed. The following is a list of file comparisons:

- West_nonERTAC_egu_[summer/winter]_ff10.csv vs. ERTAC 2028, version 2.7
- West_nonERTAC_egu_[summer/winter]_ff10.csv vs. nonERTAC_sources_outsideVISTAS_outsideWEST_20181008_ff10.csv
- West_nonERTAC_egu_[summer/winter]_ff10.csv vs. 2023el_from_ptnonipm_2011NEIv2_POINT_20140913_revised_20150115_20sep2016_v2.csv
- nonERTAC_sources_outsideVISTAS_outsideWEST_20181008_ff10.csv vs. ERTAC 2028, version 2.7
- nonERTAC_sources_outsideVISTAS_outsideWEST_20181008_ff10.csv vs. 2023el_from_ptnonipm_2011NEIv2_POINT_20140913_revised_20150115_20sep2016_v2.csv
- West_nonERTAC_egu_[summer/winter]_ff10.csv vs. Additional_nonERTAC_EASTUS_[summer/winter]_ff10.csv

- Additional_nonERTAC_EASTUS_[summer/winter]_ff10.csv vs. nonERTAC_sources_outsideVISTAS_outsideWEST_20181008_ff10.csv
- Additional_nonERTAC_EASTUS_[summer/winter]_ff10.csv vs. ERTAC 2028, version 2.7
- Additional_nonERTAC_EASTUS_winter_ff10.csv vs. 2023el_from_ptnonipm_2011NEIv2_POINT_20140913_revised_20150115_20sep2016_v2.csv

Summary

Table 6 shows total annual emissions by non-VISTAS state for the small EGUs added to the VISTAS II inventory for 2028. In total, emissions were added for 37 states amounting to a total of 95,175 tons of SO_2; 94,087 tons of NOx; 51,529 tons of CO; 10,718 tons of PM10-PRI; 8,943 tons of PM2.5-PRI; 2,932 tons of VOC; and 2,202 tons of NH_3 annual emissions in 2028. Figure 1 provides a plot of the facilities added to the VISTAS II inventory for 2028.

Table 6. Small EGUs Emissions in the 5 Files: Total Annual Emissions by Non-VISTAS State for 2028

State	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO	No. Facilities		
								Table 3[1]	Table 4[1]	Table 5[1]
AR	87	433	2	51	30	0	37	10		1
AZ	67	256	3	83	83	0	330		4	
CA	2,198	5,795	433	948	816	770	13,558		78	
CO	2,086	1,608	96	104	103	0	273		12	
CT	184	1035	20	27	23	24	247	8		5
DE	1,317	411	5	94	89	1	18	2		
IA	2,942	1,157	54	106	76	27	215	47		5
ID	93	1,299	185	134	118	0	4,139		4	
IL	21,019	4,801	67	719	431	18	1,085	23		3
IN	5,564	11,141	84	1,381	1,234	81	982	20		6
KS	8	436	24	8	8	0	154	5	19	
LA	3,989	7,913	219	976	945	38	2,460	22		2
MA	765	4,473	78	93	83	135	928	21		3
MD	10	97	0	0	0	0	8	3		3
ME	1,030	3,284	156	100	89	23	4,795	21		1
MI	5,532	5,886	65	282	180	9	2,497	62		5
MN	4,565	8,474	222	757	482	399	2,762	43		5
MO	8,872	2,780	25	552	485	10	226	45		1
MT	3,129	1,360	16	84	75	0	34		3	
ND	0	0	0	0	0	0	0			
NE	7	87	14	120	47	0	17	10	41	
NH	64	1,090	82	157	129	102	2,505	7		5
NJ	60	1,224	25	59	53	7	142	11		8
NM	0	1	0	1	1	0	2		4	
NV	5	272	23	41	22	48	69		1	
NY	731	5,543	92	198	136	64	1,351	59		3
OH	17,793	3,254	81	1,058	1,035	73	772	21		5
OK	0	771	29	163	88	10	1,591	8		2
OR	606	2,177	111	508	421	46	2,280		9	
PA	9,322	9,041	153	650	486	61	2,074	67		7

State	SO_2	NOx	VOC	PM10-PRI	PM2.5-PRI	NH_3	CO	No. Facilities		
								Table 3[1]	Table 4[1]	Table 5[1]
RI	0	1	0	0	0	0	0	1		
SD	3	19	0	4	3	0	2		2	
TX	139	3,900	383	923	876	173	1,557	95		8
UT	1,559	876	22	54	45	11	155		10	
VT	3	332	21	3	2	16	1,376	2		
WA	355	1,654	79	76	62	47	2,264		8	
WI	1,071	1,200	62	200	183	7	614	14		
WY	0	6	1	4	4	2	10		1	
Totals	**95,175**	**94,087**	**2,932**	**10,718**	**8,943**	**2,202**	**51,529**	627	196	78

[1] These columns identify the number of the table in the memorandum from which emissions were summed in Table 5.

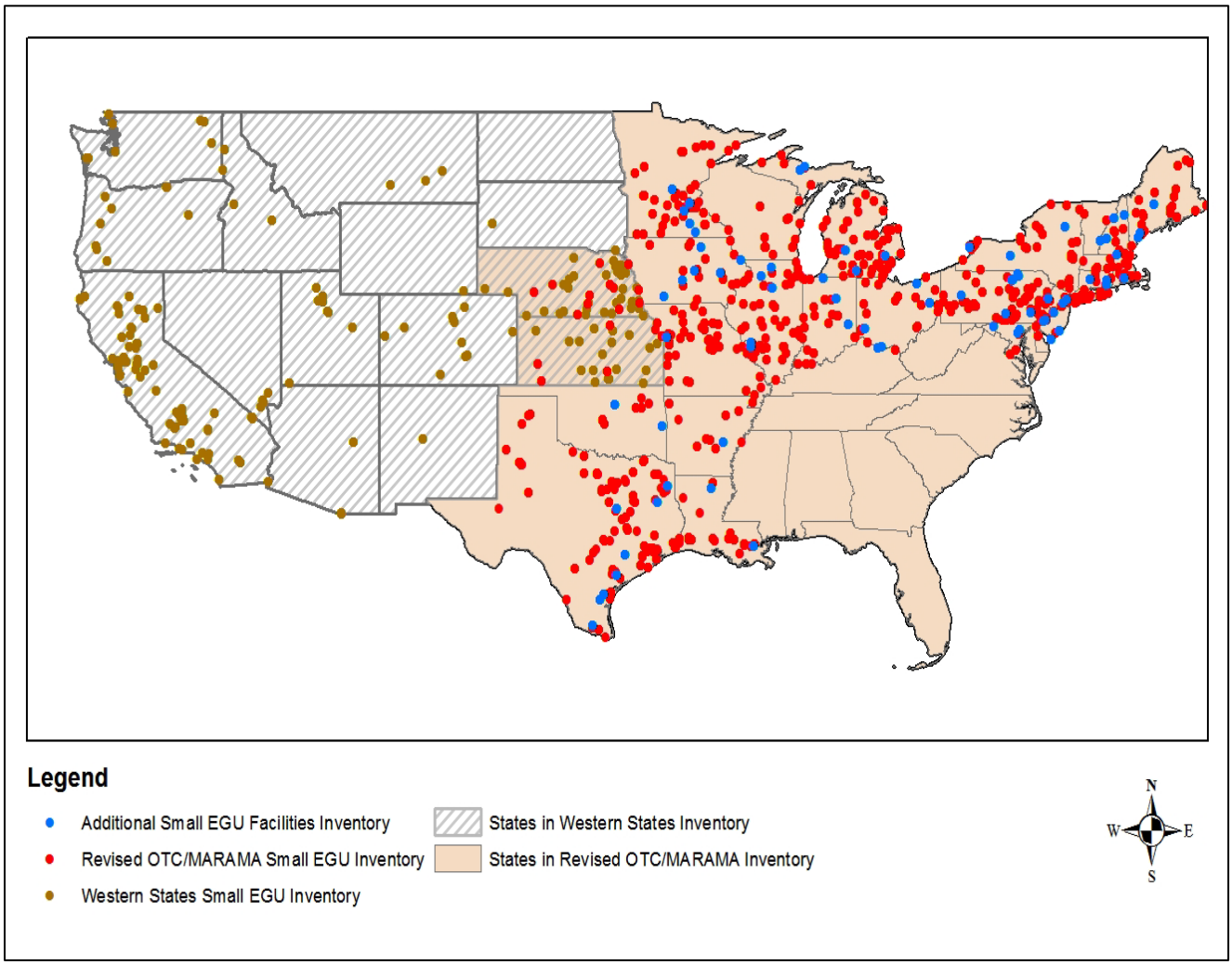

Figure 1. Plot of Small EGU Facilities Added to the VISTAS II Inventory for 2028

Attachment

Electricity Generating Unit (EGU) Coverage by the Integrated Planning Model (IPM) vs. the Eastern Regional Technical Advisory Committee (ERTAC) Forecast Tool

ERTAC developed a model to forecast air emissions from EGUs in the continental United States. The model utilizes hourly emissions monitoring data for EGUs subject to the reporting requirements of Volume 40 Part 75 of the Code of Federal Regulations (CFR) and that report to EPA's Air Markets Program Data (AMPD). The forecast tool only includes the AMPD units that 1) fire fossil fuels and 2) generate electricity for sale on regional power grids. The EGUs reporting to EPA's AMPD generally have capacities of ≥25 MW or heat inputs of ≥250 MMBtu/hr. It does not include units that generate both steam and electricity (cogeneration).

EPA's IPM is a least-cost model used to forecast electricity generation and the resulting air emissions for the United States. Both units reporting emissions to EPA's AMPD and those reporting emissions under different regulations are included. It includes all EGUs selling electricity to regional power grids, including small peaking power units <25 MW and cogeneration units. It also models generation from all source types, including fossil fuel and biomass EGUs, as well as non-emitting EGUs such as nuclear, hydropower, solar, wind and fuel cells. The ERTAC EGUs are a subset of the units contained in IPM.