

WRAP OGWG: O&G EI

PHASE 2 STATUS UPDATE

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April 9, 2019

OUTLINE

Survey

01

Forecast Scenarios

02

O&G Inventory
for Western Region
Modeling

03

Status, Schedule,
Looking Forward

04

01 SURVEY

- Operator surveys completed
 - Expect a small number of surveys to be submitted by April 15
- Next steps compile and analyze survey data
 - 39 surveys returned so far in addition to state data
 - 200+ gas composition files
 - Compiling baseline and controls inputs from survey factors by basin
 - By source category
 - By well type (oil, gas, or cbm) and/or spud type (horizontal, directional, or vertical)
- Technical memo
- *Agency involvement: operator follow-up (to the extent necessary), memo review*

- Agency submissions:
 - Colorado (draft Denver Basin survey data)
 - Wyoming (2014 and 2017 operator inventories)
 - Utah (Uinta Basin engine data)
- Number of returned operator surveys by basin and state:
 - Williston (ND): 16
 - Williston (MT): 7
 - Green River (WY): 4
 - Powder River (WY): 3
 - Permian (NM): 2
 - Central Montana Uplift (MT): 2
 - Sweetgrass Arch (MT): 2
 - Big Horn (MT): 1
 - Powder River (MT): 1

02 FORECAST SCENARIOS

- Scope:
 - 2028 future year (based on 2023 emission rates and activity forecasts)
- Held teleconferences with agencies on basin forecasts
- Will finalize medium scenarios based on agency input (due by April 5th)
- Developing low and high scenario methodology
- *Agency involvement: provided comments on medium scenarios by April 5th, late-spring review of low & high scenario methodology*

03 O&G EMISSION INVENTORY FOR WESTERN REGION MODELING

- 2014 Shakeout v1 (actual emissions): O&G sector emissions based on 2014 NEIv2
- 2014 Shakeout v2 (actual emissions): O&G sector emissions based on 2014 NEIv2 **unless** agency indicates that O&G sector emissions from the WRAP OGWG v1 emission inventory should be used (*emission summary comparison provided on the following slide*)
 - WYDEQ and NMED have indicated that emissions for their jurisdictions should be based on WRAP OGWG v1
- 2013-2017 Representative Baseline: Will be based on WRAP OGWG v2 emission inventory

03 O&G EMISSION INVENTORY FOR WESTERN REGION MODELING

ST ABBV	2014 WRAP OGWG v1						WRAP_Shake-out						Difference Percentages					
	NOx	VOC	CO	SO2	PM10	PM2.5	NOx	VOC	CO	SO2	PM10	PM2.5	NOx	VOC	CO	SO2	PM10	PM2.5
AK	42,348	27,097	12,923	1,953	1,113	1,088	41,644	27,045	12,760	1,762	1,051	1,028	2%	0%	1%	11%	6%	6%
AZ	1,960	280	439	33	51	51	2,155	283	445	36	56	56	-9%	-1%	-1%	-7%	-8%	-8%
CA	6,773	114,159	5,622	1,160	1,255	1,249	5,002	27,043	5,258	1,031	1,257	1,251	35%	322%	7%	12%	0%	0%
CO	65,985	189,113	56,710	710	1,929	1,929	58,031	107,231	48,784	522	1,889	1,846	14%	76%	16%	36%	2%	4%
ID	889	34	272	4	10	10	889	34	272	4	10	10	0%	0%	0%	0%	0%	0%
MT	5,933	50,995	5,448	288	175	175	5,828	50,965	5,255	293	233	178	2%	0%	4%	-2%	-25%	-2%
NV	156	269	111	15	11	11	279	282	128	20	22	22	-44%	-5%	-13%	-28%	-49%	-49%
NM	76,288	210,988	100,303	12,665	2,130	2,130	54,253	178,156	58,683	7,355	1,014	1,004	41%	18%	71%	72%	110%	112%
ND	39,365	478,167	32,000	3,847	1,325	1,325	40,947	475,624	30,253	7,660	2,234	2,100	-4%	1%	6%	-50%	-41%	-37%
OR	454	73	263	13	20	20	454	73	263	13	20	20	0%	0%	0%	0%	0%	0%
SD	693	3,090	496	13	77	77	652	2,914	362	13	75	75	6%	6%	37%	0%	2%	2%
UT	16,379	112,485	14,145	586	706	706	17,598	112,280	14,245	595	780	759	-7%	0%	-1%	-2%	-10%	-7%
WY	46,171	264,821	21,384	6,888	1,276	1,276	32,632	216,127	19,432	7,542	1,343	1,204	41%	23%	10%	-9%	-5%	6%

04 STATUS, SCHEDULE AND LOOKING AHEAD

- Task 1: Base Year Inventory
 - Complete: Base year (version 1) inventory and O&G activity complete
 - In-progress: Survey Compilation
 - Next steps: Integrate survey results into baseline emission inventory
- Task 2: Forecast 2028 Inventory (On-the-books controls)
 - Completed: Compilation of historical activity, draft medium scenarios
 - In-progress: Agency review of medium scenario, low and high scenario methods
 - Agencies to provide comments on medium scenarios by April 5th
- Not yet started
 - Task 3: Forecast 2028 Inventory (Additional reasonable controls)
 - Task 4: O&G Program and Emission Management Review
 - EPA Modeling Platform Review (pending EPA release)

04 STATUS, SCHEDULE & LOOKING AHEAD

Activity	2019												
	Feb	Mar	Apr	May	Summer	Fall	Winter						
Task 1: Base Year Inventory & Survey													
Operators fill-out surveys	■	■	■	■	■								
All surveys provided to Ramboll by				■									
Ramboll compiles and analyzes survey data by March 22	■	■	■	■	■	■	■	■	■				
Ramboll delivers survey results memorandum								■					
WRAP OGWG members provide comments on survey results memo								■	■				
Ramboll incorporates survey results into base year inventory	■	■	■	■	■	■	■	■	■	■			
Ramboll delivers draft version 2 base year inventory and report										■			
WRAP OGWG comments on draft base year inventory (v2) and report									■	■			
Ramboll Modeling Platform Review							■	■	■	■			
Ramboll delivers modeling platform review results										■			
Task 2: Future Year Inventory: On-the-books and On-the-way (OTB and OTW) Controls													
Identify forecast scenarios	■	■	■	■	■	■	■	■	■	■	■		
OTB and OTW Emission Controls	■	■	■	■	■	■	■	■	■	■	■	■	
OTB and OTW controls future year inventory and report												■	
Task 3: Future Year Inventory: Additional Reasonable Controls													
Identify Additional Reasonable Controls for Oil and Gas Sources													
Additional Reasonable controls future year inventory and report													
Task 4: O&G Programs and Emission Management													
Identification and Review of Member Agency Oil & Gas Programs													

State agency / operator activity
 Ramboll Activity

QUESTIONS?