



METHANE EMISSIONS REDUCTION STRATEGIES AND MEETING WASHINGTON'S CLEAN AIR RULE REQUIREMENTS

2017 SWANA Northwest Regional Symposium

April 26, 2017

Eric Sonsthagen, P.E.



PRESENTATION OUTLINE

- Clean Air Rule Overview
- Emission Reduction Pathways
- Emission Reduction Strategies
- Emission Reduction Costs
- Effects of Landfill Gas Emissions Reduction Strategies
- Open Discussion / Q&A



OVERVIEW

Highlights

▪ GHG Emission Standards and Reductions Over Time




- Rule starts in 2017 for existing facilities
- GHG baseline established in the 1st year of applicability (Existing facilities 2012 – 2016 emissions)
- 1.7% annual emission reduction of the baseline (1.66% reduction + 0.034% reserve)

▪ Compliance Reporting



- Compliance Reports are submitted in year following the end of each compliance period
 - Emission Reduction Units (ERU's) Generated
 - ERU's Banked
 - ERU Transactions

▪ Verification of Compliance



- 3rd Party verification of emissions reductions
- Annual GHG reports under WAC 173-441 must be 3rd party verified as well

▪ Development of an Emission Reduction Registry and Reserve



- Ecology developed registry to track ERU's

OVERVIEW

WAC 173-442 Applicability & Thresholds

- Applies when 3-year rolling GHG emissions average, starting in 2012, is greater than or equal to, the corresponding compliance period threshold.
- Applicability begins no earlier than 2020 for EITE covered parties and petroleum product importers.
- Once subject to the requirements, you can get out after three consecutive years of GHG emissions less than 50,000 MT CO₂e.
- Voluntary participation – must comply with requirements, except no emission reduction requirements.
- Compliance Periods - 3-year periods at the end of which compliance must be demonstrated and reported.

Compliance Threshold	
Compliance Threshold (MT CO ₂ e/Year)	First Compliance Period (Calendar Year)
100,000	2017-19*
95,000	2020-22
90,000	2023-25
85,000	2026-28
80,000	2029-31
75,000	2032-34
70,000	2035 and beyond

* The 100,000 MT CO₂e/Year threshold is used for the three calendar year rolling average applicability determination beginning in 2012.

Waste Industry:

Cedar Hills Regional Landfill
Cowlitz County HQ Landfill
LRI Landfill
Roosevelt Regional Landfill
Spokane Waste to Energy
Terrace Heights Landfill

OVERVIEW

Exemptions

- Manure Management – Subpart JJ
- Coal-Based Liquid Fuel Suppliers – Subpart LL
- Industrial GHG Supplies – Subpart OO
- Importer/Exporter of Fluorinated GHGs in Pre-Charged Equipment or Closed-Cell Foams – Subpart QQ
- CO₂ from combustion of biomass
- CO₂ converted into mineral form
- Emissions from a Coal-Fired baseload electric generating facility in WA that emitted more than 1MM tons of GHGs in any year prior to 2008
- Stationary Sources captured by the Clean Power Plan (40 CFR Part 60 Subpart UUUU) are considered to comply at the beginning of the first compliance period of the Clean Power Plan



EMISSION REDUCTION PATHWAYS

▪ On-Site Emission Reductions

- Reducing emission at facility
- May also generate ERU's if emissions reduced below the established reduction pathway – extra ERU's can be banked or exchanged

▪ Emission Reduction Projects

- Must be projects in WA and recognized by Ecology
- Must be real, permanent, enforceable, verifiable and not required by other legal requirements.
- Rule accepts ERU's generated from Clean Power Plan, WA Emission Performance Standard, CO₂ Mitigation Standard for New Power Plants, Commute Trip Reduction program.

▪ Market Emission Reductions

- May use allowances to obtain emission reductions when issued by an Ecology approved GHG emission reduction program.

▪ Emission Reduction Programs

- ERU's only generated by projects and activities recognized by Ecology, which includes Renewable Energy Credits (RECs). Must be real, permanent, enforceable, verifiable and not required by legal requirements.
- Rule accepts ERU's from Clean Power Plan, WA Emission Performance Standard, CO₂ Mitigation Standard for New Power Plants and Commute Trip Reduction program.



EMISSION REDUCTION STRATEGIES

On-Site Emission Reductions

- Early Closure – Areas at final grade or prescriptive cover at interim grades
- Increase LFG Collection – Send more LFG off-site to beneficial uses
- Organic Waste Diversion – Less decomposable materials going into the landfill

Emission Reduction Projects

- Transportation - vehicle fleet conversion, commute trip reduction
- Energy - conservation, REC's
- Waste/Wastewater - U.S. Landfill, Organic Waste Composting, Organic Waste Digestion from Climate Action Reserve Landfill Methane Collection and Combustion from American Carbon Registry
- Livestock, Industrial Activities, Combined Heat and Power - methodology approved by Ecology



EMISSION REDUCTION STRATEGIES (continued)

Market Emission Reductions

- Climate Action Reserve
- Regional Greenhouse Gas Initiative (RGGI)
- European Union's Emissions Trading Scheme (EU ETS)
- Others?

Limits on Use of Allowances

COMPLIANCE PERIOD	UPPER LIMIT
2017-19	100%
2020-22	100%
2023-25	50%
2026-28	25%
2029-31	15%
2032-34	10%
2035 and beyond	5%

Vintage Year Requirements

YEAR W/IN COMPLIANCE PERIOD	VINTAGE YEAR OF ALLOWANCE	NOT TO EXCEED %
1 st Year	Same year as the 1 st year of the compliance period	35%
2 nd Year	Same year as the 2 nd year of the compliance period	40%
3 rd Year	Same year as the 3 rd year of the compliance period	40%

EMISSION REDUCTION COSTS



- **On-Site Emissions Reductions** -
Reductions created internally
 - \$23 - \$57 per MT CO₂e
- **Emissions Reduction Projects** -
Reductions created through external projects
 - \$5 - \$29 per MT CO₂e
- **Market Emissions Reductions** -
Purchasing allowances from existing carbon markets
 - \$13 - \$14 per MT CO₂e
- **Emission Reduction Programs** -
Purchasing Renewable Energy Credits
 - \$3 - \$11 per MT CO₂e

Source:

Ecology Final Cost/Benefit Analysis September 2016

Note - does not include other compliance related costs