

### **MDE's Methane Reduction Initiatives**

## Minimizing Methane Emissions from the Natural Gas Industry







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## **Topics for Discussion**

- Addressing Climate Change in Maryland
- Initial Efforts Focusing on Natural Gas Transmission and SLCP's
- Phase II MSW Landfills and NG Distribution
- Overview and Discussion of MDE Research, Federal and Industry Efforts
- Need for additional State Regulation?



# **CLIMATE CHANGE ... THE KEY** POLICY DRIVER BEHIND THE EFFORTS TO MINIMIZE METHANE **EMISSIONS**



## Climate Change in Maryland



Photo: https://pixabay.com/photos/thermometer-summer-heiss-heat-sun-4294021/

Addressing Climate Change and reducing greenhouse gas (GHG) emissions has become a major issue in Maryland for the past ten years

There are four key areas of focus:

- The Greenhouse Gas Emissions Reduction Act (GGRA) of 2009 and 2016
  - Reducing leaking methane is a major part of the GGRA process
- The Maryland Commission on Climate Change (MCCC)
- 3. Partnerships
  - Regional Collaborations
    - RGGI, ZEV MOU
    - United States Climate Alliance (USCA)
- 4. Pushing back on Federal backsliding
  - Many legal Challenges



## The Greenhouse Gas Emission Reduction Acts (GGRA) of 2009 and 2016

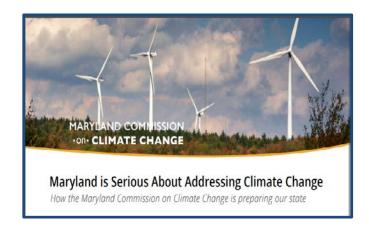
- Climate change effort originated in 2007 by Executive Order
  - Resulted in a 2008 "Climate Action Plan"
- This led to the "Greenhouse Gas Emission Reduction Act" of 2009
  - 25% Greenhouse Gas (GHG) Emission reduction by 2020
- 2009 law reauthorized in 2016, adding new goals
  - 40% GHG reduction by 2030
- The Acts also require that the State's GHG Reduction Plans support a healthy economy and create new jobs





# Maryland Commission on Climate Change (MCCC)

- Original Climate Change Commission established through executive order in 2007 - Developed a 2008 Climate Action Plan that led to the 2009 GGRA
- MCCC codified into law in 2015
- Established a balanced, bipartisan Commission
  - Representatives from the General Assembly, state and local government, the private sector, environmental advocacy groups, labor, the general public & more
- Basic charge of the MCCC:
  - Provide recommendations on how to reduce GHG emissions and adapt to the impacts of climate change
- Reducing leaking methane emissions has been a very high priority for the MCCC





### 2030 GGRA Plan

- The law calls for a reduction of GHG emissions of 40% by 2030 (from 2006 levels)
- Our 2030 GGRA Plan pursues a more ambitious goal, recommended by the Maryland Commission on Climate Change of 50% reductions by 2030
- Federal policies can help if the Biden Administration adopts effective federal control programs in certain areas like trucks, boats, locomotives and aircraft
  - Maryland would exceed the National Target of 50-52% reduction in GHGs from 2005 levels in 2030



## The 2030 Plan – Some Highlights

- Establishes new climate solutions such as increased carbon sequestration in forests and agricultural soils
- Planting more than seven million trees and improved management of existing forests and farms to sequester more carbon in trees and soils
- Emission reductions from electricity generation, transportation, building energy, and natural gas infrastructure
- Investments in energy efficiency and clean and renewable energy solutions, clean transportation projects and widespread adoption of electric vehicles
- Investments in new industries and technologies and "green" jobs in the electric, transportation and buildings sectors, the largest sources of GHG emissions in Maryland



### **Short-Lived Climate Pollutants**

#### What are (SLCPs):

- SLCPs, or short-lived climate pollutants, are pollutants that have powerful impacts over a short period of time. Examples include:
  - Hydrofluorocarbons (HFCs) from various industries
  - Methane from oil and gas sector, landfills, agriculture, WWTPs, etc.
  - Black carbon from woodstoves and the transportation sector

### Why they are important:

- Many are harmful air pollutants and potent climate forcers
- Shorter atmospheric lifetime means faster climate response after reducing emissions
- Quickly cutting emissions of these potent pollutants will lead to quick climate benefits



## **Transmission Sector Methane Control under COMAR 26.11.41**

- Affected Sources
  - 5 Compressor Stations
  - Cove Point LNG
  - Underground Storage
- LDAR practices and reports
  - Most quarterly
  - 30 day or less repair confirmation
  - OGI and Method 21
- Maintenance and improved compressors and pneumatic devices
- Improved reporting
  - Blowdown notifications for larger events with public transparency – release of over 1 million metric tons



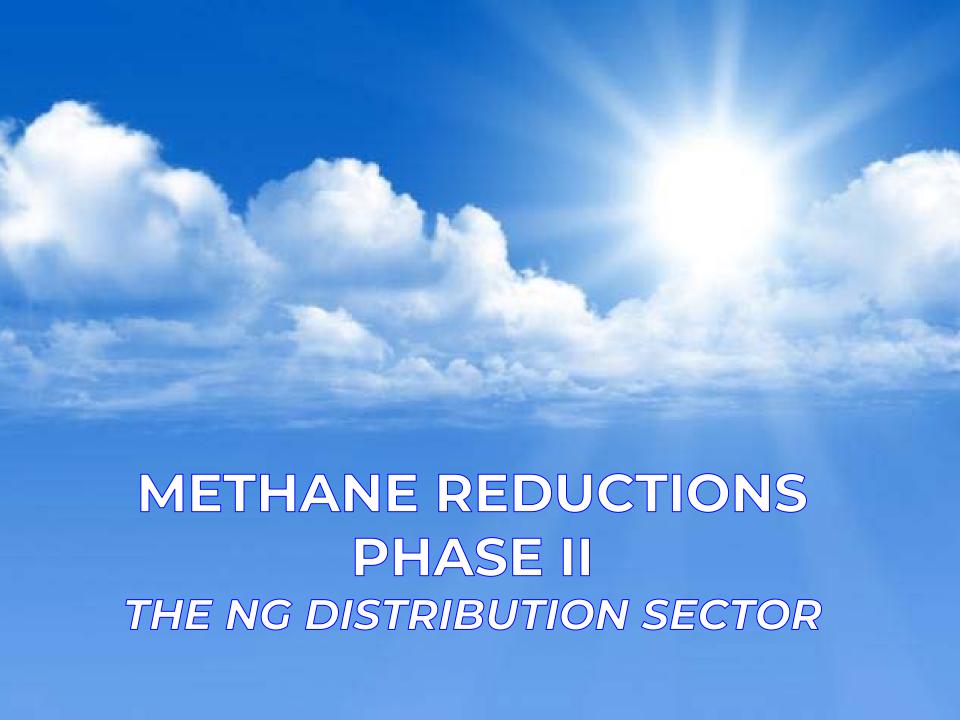
### **MSW Landfills**

Beyond EPA New Source Performance Standards and Emission Guidelines for existing sources with Air Administration

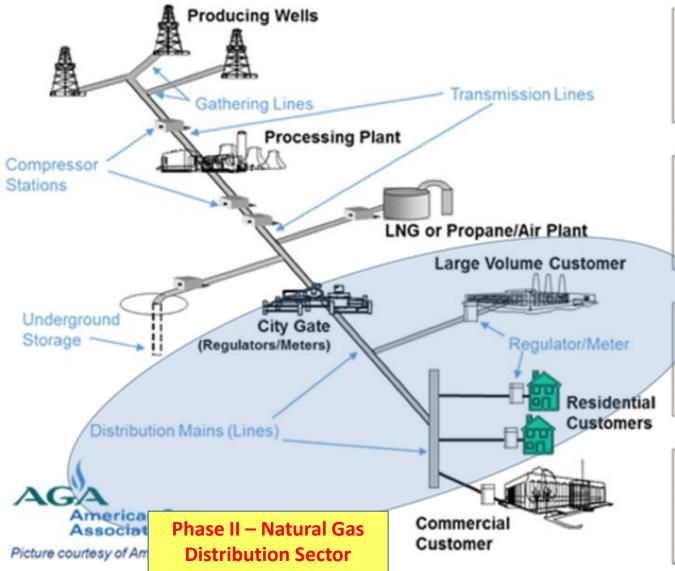
- Smaller threshold for landfills subject to review, reporting and testing
  - Either require a gas collection system, or
  - Perform surface monitoring for exemption
- Active and closed landfills accepting waste after 1987
- Stakeholder meetings to continue

Waste Diversion and Recycling discussions with Land Administration





## Oil and Natural Gas Industry in General



#### Production

- Pneumatic Controllers
- Gathering/Boosting Stations
- Tanks
- Chemical Injection Pumps

#### **Gathering and Processing**

- Reciprocating Compressors
- Centrifugal Compressors
- Gas Engines
- Blowdowns/Venting

#### Transmission

- Reciprocating Compressors
- Station Fugitives
- Engines
- Pipelines

#### Distribution

- · Mishaps (Dig-ins)
- Residential
- · Mains Unprotected Steel
- Services Unprotected Steel



## **Distribution Sector Potentially Affected Sources**

- Pipeline Distribution Utility Companies
  - Baltimore Gas and Electric
  - Chesapeake Utilities Corporation
  - Columbia Gas
  - Easton Utilities
  - Elkton Gas
  - Eastern Shore Natural Gas
  - UGI Utilities (Penn Fuel Gas, Inc.)
  - Washington Gas Light
  - Sandpiper Energy



- Natural Gas Storage (Peak Stations)
  - Baltimore Gas and Electric Spring Gardens, Baltimore, MD
  - Washington Gas Rockville Station, Rockville, MD
- Licensed by Maryland Public Service Commission (PSC)

## **Emissions from Distribution Sector**

- Pipeline mains, metering stations, pipeline services, service connections, storage facilities
- MDE 2017 GHG Inventory
  - Gas utility companies connected to interstate pipelines via 7 primary interstate pipelines
  - Over 15,000 miles of pipeline
  - Approximately 1,000,000 services supplied
  - Two storage facilities to allow supplies to be held and released to meet times of peak demand

Emissions by Gas (MMTCO <sub>2</sub> e)	
DRAFT	2020
Natural Gas	0.7758
Production	0.0001
Transmission	0.1649
Distribution	0.6100
Pipeline Fuel	0.0009



## Distribution Sector Emission Source Aging "Leak Prone" Pipes

- Industry programs and legislation focus to replace the aging, at-risk cast iron and unprotected steel pipelines that are subject to more leakage
  - Locate, evaluate, repair and mitigate leaks
- To avoid leaking emissions and product loss, and for safety, industry best management practices include:
  - Replacement with plastic or protected steel
  - Flexible insert liners
  - Leak volume assessment
- Inventories record the new pipeline type with a lower emission factor



# Distribution Sector Existing Inventory and Reporting

- EPA GHG Reporting Part 98
- Pipeline and Hazardous Materials Safety Administration Requirements (PHMSA)
- STRIDE Program Commitments
- Maryland GHG Inventory and GGRA





### **PHMSA** database

- Publicly available All utilities report annual infrastructure totals <a href="https://portal.phmsa.dot.gov/analytics">https://portal.phmsa.dot.gov/analytics</a>
- MDE NG Distribution sector analysis
  - Historic trends calculated from PHMSA 2006 to 2018
  - Use EPA 100-year GHG emission factors to convert pipeline replacement to CO2e reductions
  - BGE largest MD system and oldest infrastructure = 25% system
     reduction
  - WGL second largest MD system with older infrastructure = 28% system reduction
  - Columbia Gas smallest MD system with aging infrastructure = 48% system reduction
  - Other Utilities minimal reductions



- STRIDE Strategic Infrastructure Development and Enhancement Plan
  - Accelerate the modernization of the natural gas system
  - STRIDE legislation passed by the Maryland General Assembly in 2013, codified as PUA § 4-210
  - PSC oversight
  - STRIDE 1 covers the period of 2014 2018
  - STRIDE 2 covers the period of 2019 2023
  - Allows surcharge to the customer/rate payer
- STRIDE is focused on the accelerated replacement of at-risk piping:
  - Cast Iron Main
  - Bare Steel Mains and services
  - Copper Services
  - Pre-1970 ¾" High Pressure Steel Services
- Only three (3) utilities in Maryland have at-risk piping:
  - Baltimore Gas & Electric BGE
  - Washington Gas Light Company WGLC
  - Columbia Gas of Maryland



BGE - Complete all "leak prone" piping replacement by 2037

- 2014 2017 (first 4 years) 150 miles of gas main and 32,000 gas service replacements resulting in reduction of 1 million lbs of methane
- Accelerated investment equal to \$390 million, 850 full time jobs
- Total STRIDE program will reduce emissions by 210,000 metric tons CO2e

WGLC Maryland - Complete "leak prone" piping replacements by 2036

- 2014 2017 (first 4 years) 66 miles of gas main and 15,000 gas service replacements
- Total STRIDE program will reduce emissions by 92,000 metric tons CO2e
- Re-prioritize pipeline replacements for safety and emission reductions, focus on specific pipeline material that is beyond what the STRIDE format for quantification allows

Columbia Gas Maryland - Complete all "leak prone" piping replacement by 2026

- Total STRIDE program will reduce emissions by 7,500 metric tons CO2e
- Accelerated investment equal to \$72 million



### **Reduction Trends**



- PHMSA reported data from 2006 2018, with EPA emission factors, MDE calculates an overall NG distribution system reduction of 24%
- Overall NG distribution system reduction from 2014 – 2018, utilize piping infrastructure reporting, including the first 4 years of STRIDE I, MDE calculates 11% reduction in CO2e
  - STRIDE 2 (2019 2023) accelerates leak prone piping replacement
- MDE GHG Inventory projections include a 3-5% annual reduction out to 2037 when all at-risk piping is replaced

## **Inventory and Forecast Improvements**

- Want to incorporate the NG Distribution accomplishments into our GHG Inventory and GGRA
- Would like to forecast GHG emissions to tie yearly improvement data with growth potential to show declining trends with modernization and increasing infrastructure
  - Voluntary or MOU agreement rather than regulatory
  - Example Regulation State of MA 310 CMR 7
  - Establish mass-based, annually declining aggregate limits on total methane emissions from mains and services
- Improve emission factors
- Looking beyond pipeline upgrades and the existing data to BMP's like LDAR with quarterly reports



## Distribution Sector Emission Sources under reported

### Improve databases for

- Blowdown releases or diversions
- Construction/damage releases
- Condensate uploading measurements

### Regulatory consideration for

- Best Management Practice includes Leak Detection and Repair (LDAR) practices
- Emissions monitors
- Meter station improvements
- Storage tank improvements





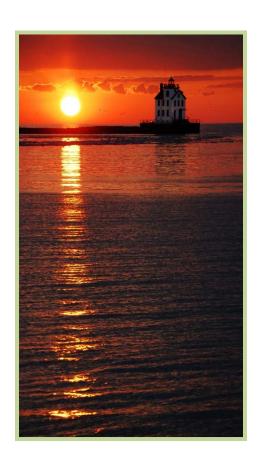
## **Leak Detection and Repair**

### LDAR with quarterly reports

- All meter stations
- All tanks
- More frequent survey's discover super emitter events more quickly

#### **Emission monitors and sensors**

- LEL
- Infrared monitors
- Drone technology





### **PHMSA UPDATES JUNE 2021**

 In June, PHMSA, announced an Advisory Bulletin to all pipeline operators that underscores that all pipeline operators minimize the release of natural gas – including both vented and fugitive emissions

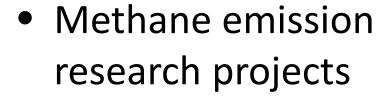
#### Rulemakings:

- PHMSA is working to finalize three rulemakings that can significantly reduce methane emissions associated with pipeline safety incidents (Gas Gathering Rule, Valve Rule, Transmission Rule) and
- is developing two new NPRMs (Methane Leak Detection Repair Rule;
   Gas Distribution Rule)
- Infrastructure legislation: includes support for community owned gas companies to replace legacy cast iron mains reducing methane emissions and helping mitigate heightened safety issues in vulnerable urban areas



## **MDE Next Steps**

- Continue stakeholder collaboration and exploring methane reductions in the NG distribution sector
- Improve inventory and projections







## **Questions/Discussions**

