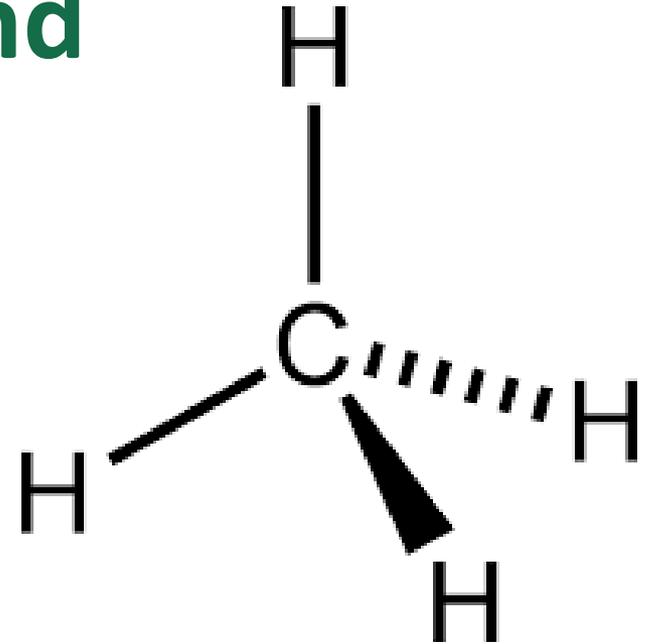




Maryland  
Department of  
the Environment

# Minimizing Methane Leakage in Maryland

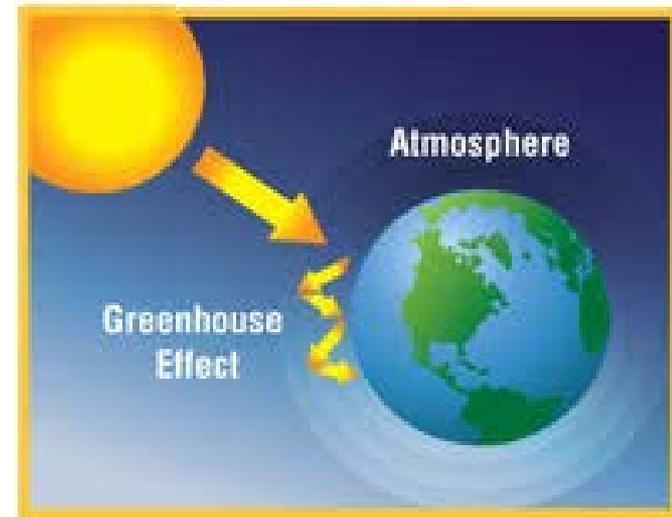
AQCAC Briefing  
December 10, 2018





# Methane – The Basics

- Methane is the second most prevalent greenhouse gas (GHG) emitted in the U.S. from human activities
- On a per unit basis, methane is at least 25 times more potent at trapping heat in the atmosphere than CO<sub>2</sub> over a 100 year period, and about 72 times more potent over a 20 year period
- Methane accounts for about 10% of all U.S. greenhouse gas emissions from human activities\*





# Why the Concern Over Methane?

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- Maryland and many other states are making significant progress in reducing the primary GHG - CO<sub>2</sub>
- States like Maryland are also pushing to reduce other “short-lived” climate pollutants like methane and black carbon
  - A recently announced initiative of the U.S. Climate Alliance that Maryland is a part of ... The Short-Lived Climate Pollutant Challenge
- Increased use of natural gas has led to increased methane emissions
- A major issue discussed as part of the Maryland Climate Change Commission (MCCC) process



# Maryland Commission on Climate Change

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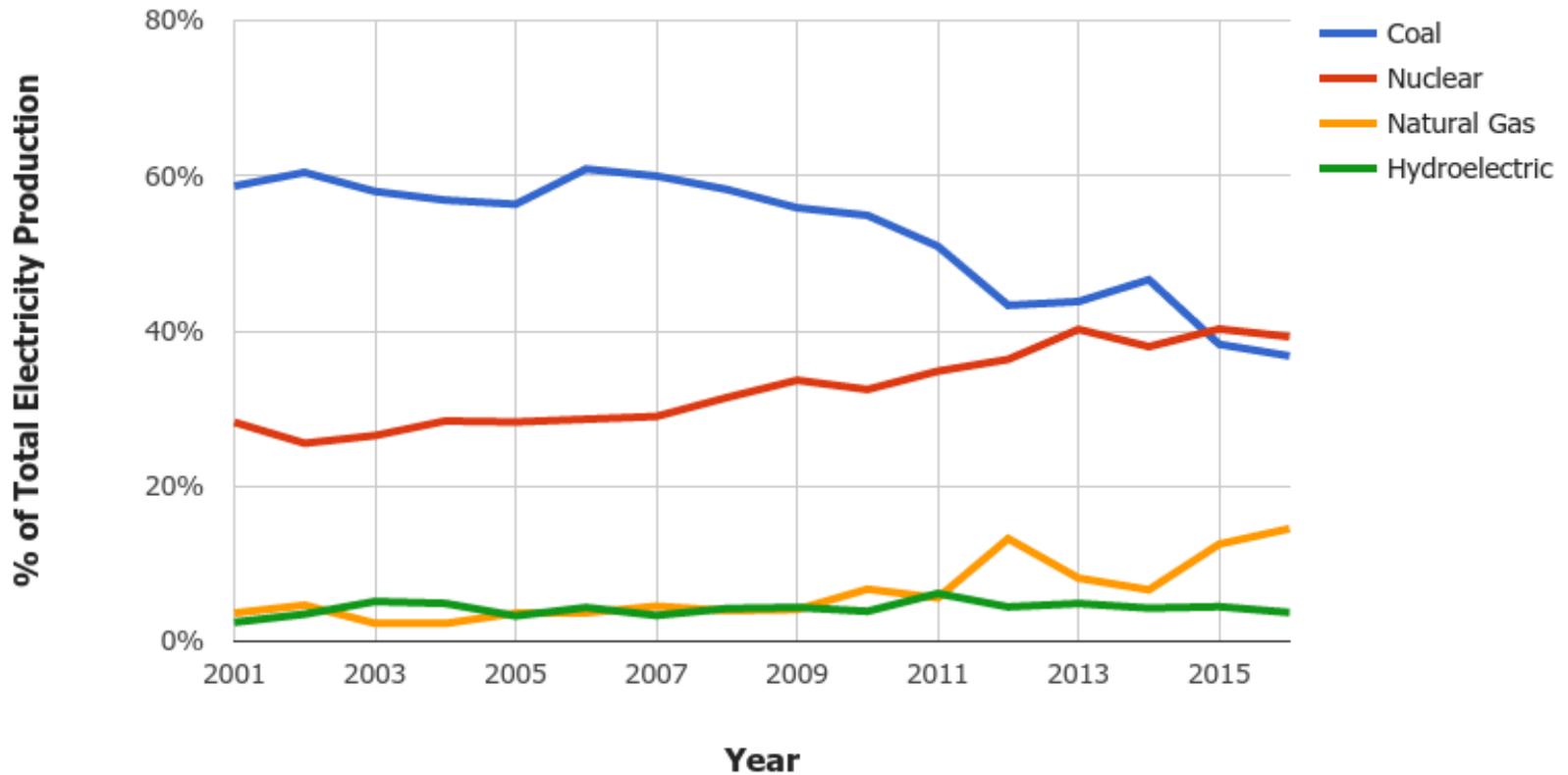
- Originated in 2007 under Executive Order
- Developed the 2008 Maryland “Climate Action Plan” which led to the “Greenhouse Gas Emission Reduction Act” of 2009
- MCCC codified into law in 2015
  - Recommended enhancements to the 2009 GGRA
  - Reauthorized by the General Assembly in 2016 to add additional goal to GGRA for 2030
    - 40 % GHG reduction by 2030
    - The act also requires that the plan support a healthy economy and create new jobs
- Basic charge of the Commission:
  - Provide recommendations on how to reduce GHG emissions and develop plans responding to the impact of climate change





# Natural Gas in the Maryland Power Sector

**Maryland Energy Mix**



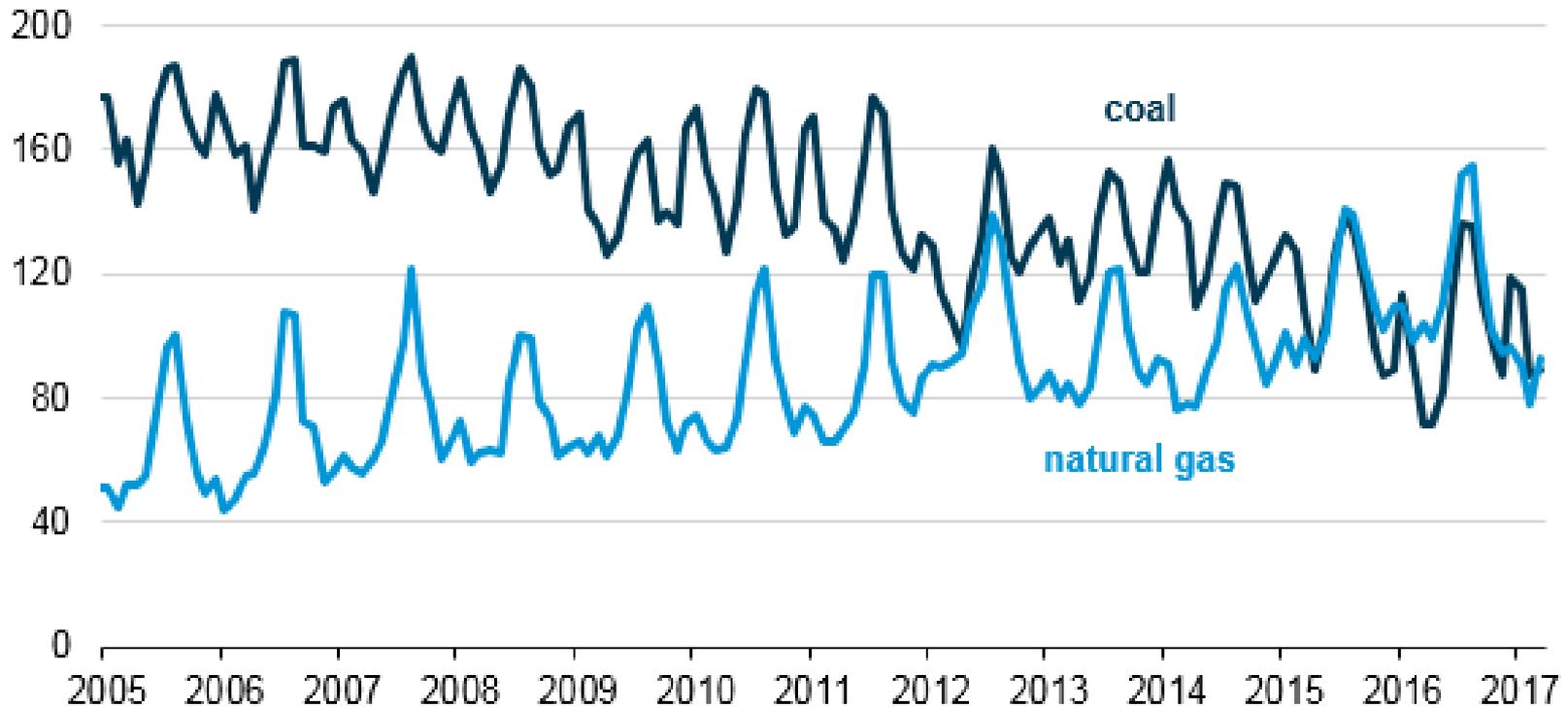
Source: U.S. Energy Information Administration, 2016



# Natural Gas Nationally

In 2016, natural gas surpassed coal as the leading generation source in the US

Monthly U.S. net electricity generation from coal and natural gas (Jan 2005-Mar 2017) million megawatthours 



Source: U.S. Energy Information Administration, *Electric Power Monthly*



# Continued Growth

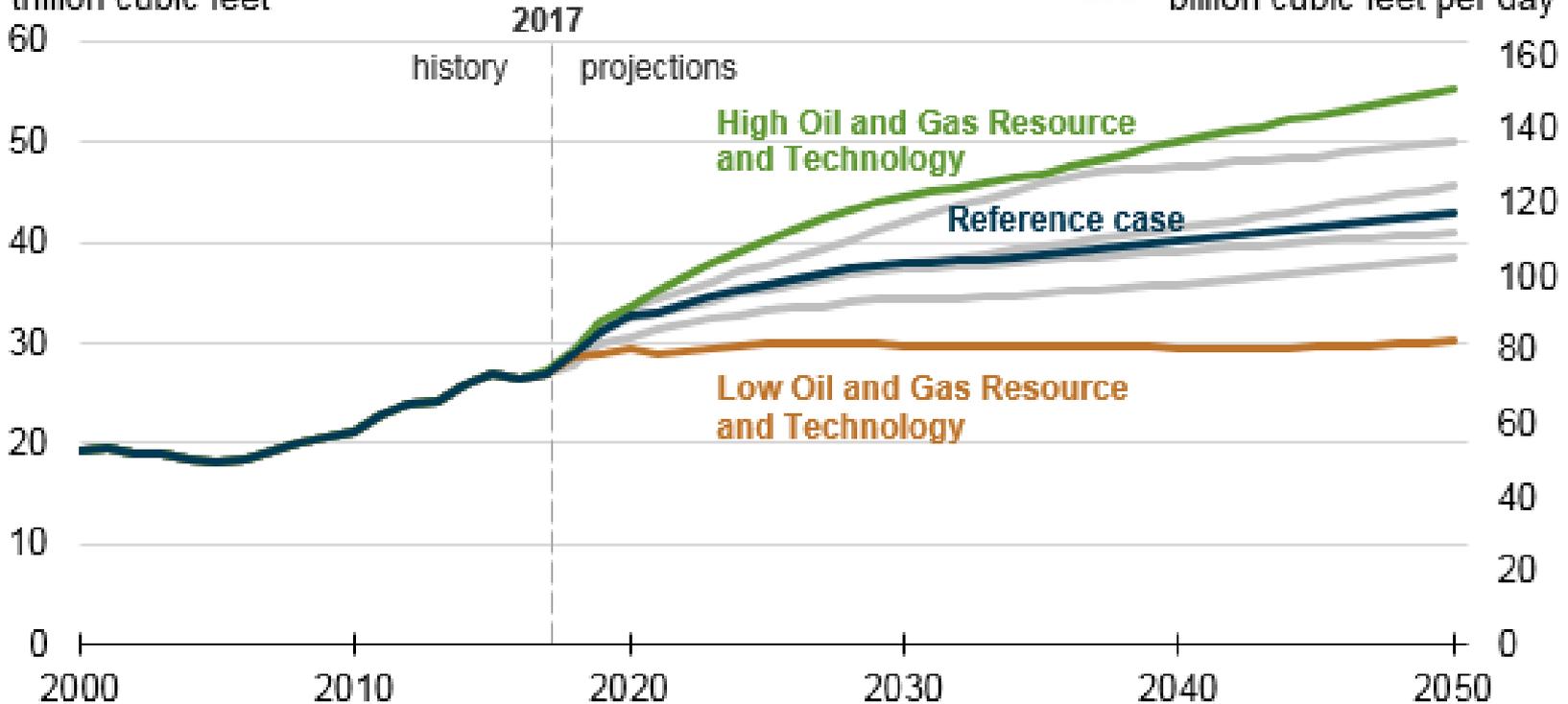
*US Natural Gas Production and Consumption are Expected to Keep Rising*

U.S. natural gas production (2000-2050)

trillion cubic feet



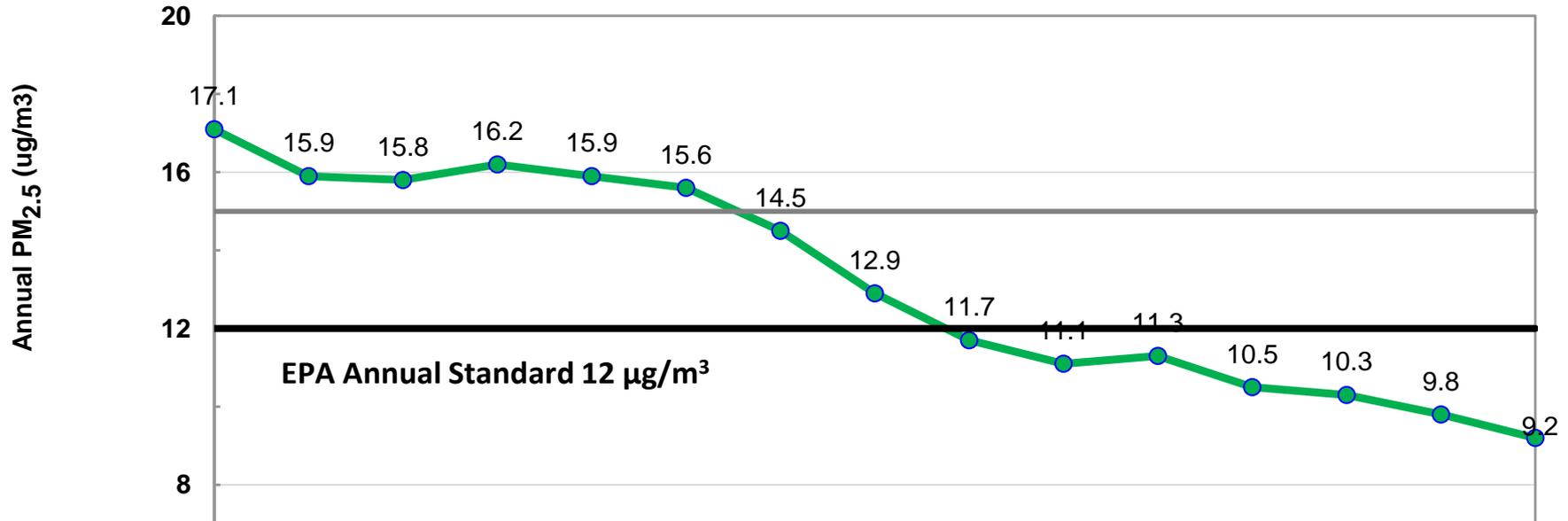
billion cubic feet per day



Source: U.S. Energy Information Administration, Annual Energy Outlook 2018



# Natural Gas and Improved Air Quality - Fine Particles



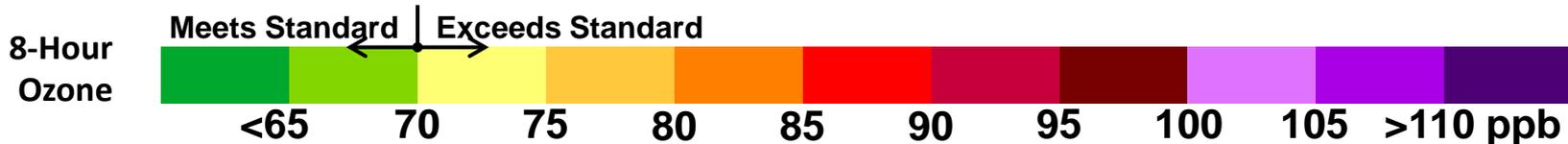
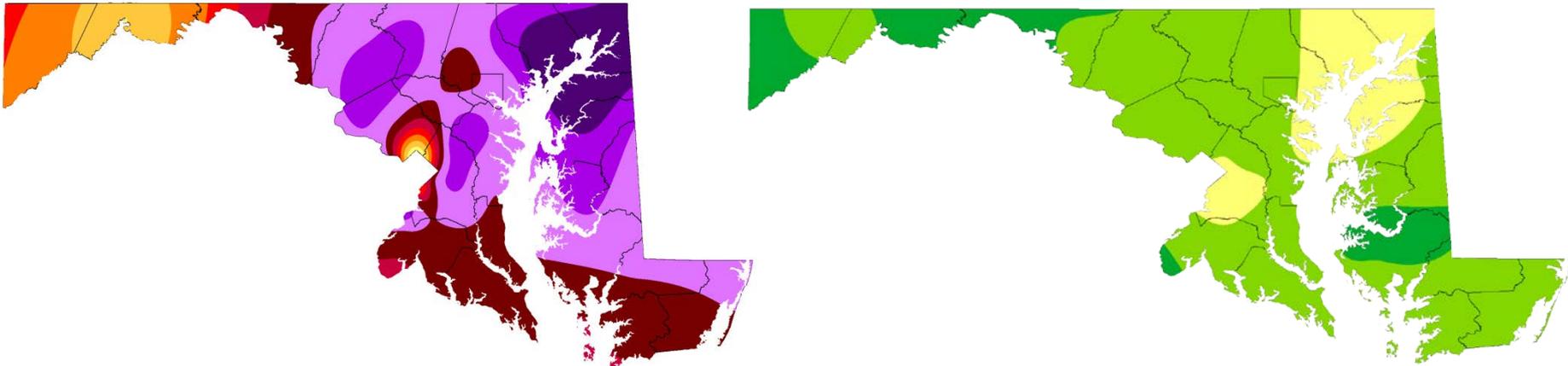
- Since 2012, Maryland has been attaining the daily and annual fine particle standards across the state
- Fine particulate levels continue to trend downward
- This is a major success story as the health risks associated with fine particulate are very significant
- Increased use of natural gas across the East has played a major role in this progress



# Maryland's Shrinking Ozone Problem

1990

2017\*

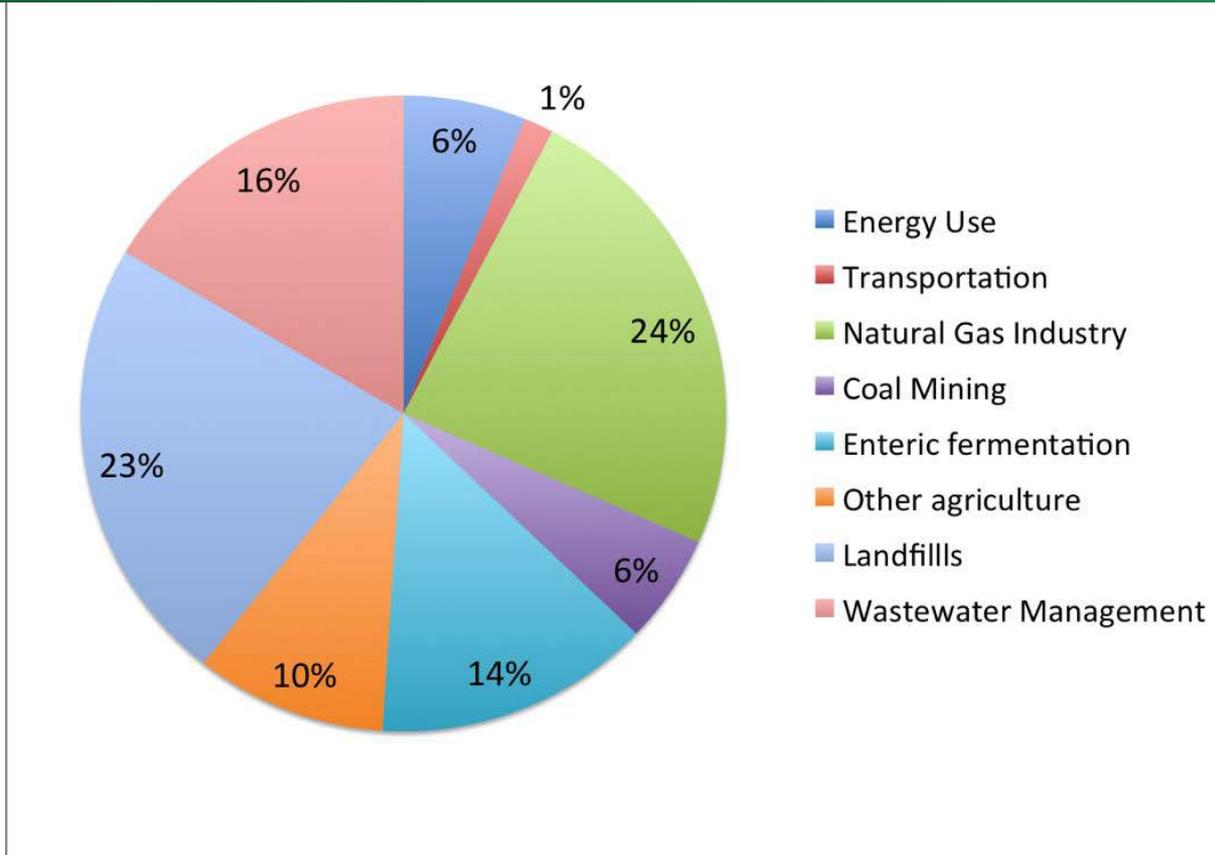


- Maryland is on the verge of attaining the most recent standard for ground level ozone (70 ppb)
- For the last five years, we have seen nitrogen oxide (NO<sub>x</sub>) emissions drop dramatically each year
- Increased use of natural gas across the East has played a major role in reducing NO<sub>x</sub> emissions and lowering ozone levels



# Maryland Methane Emissions

## Maryland Methane Emissions, By Source



Sources of methane emissions in Maryland based on the Maryland Department of the Environment's 2014 GHG Emissions Inventory.



# Key Methane Efforts in Maryland

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- Ban on hydraulic fracturing - A major first step
  - Adopted by Governor in April 2017
- Reducing methane leakage in Maryland
  - Focused on three largest in state emission categories
    - Compressor stations
    - Landfills
    - Waste water treatment plants
- Addressing upstream methane leakage
  - Estimates of upstream emissions being included as a complementary data set while MDE is developing GHG inventories for the 40 by 30 goal
- Maryland and many other states are also challenging EPA in Court over federal rules for new and existing sources in the natural gas sector



# Key Methane Efforts in Maryland

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- Initial stakeholder meetings with industry, environmental advocates, and community groups along with facility visits over the past year and a half to receive input and discuss concerns.
  - Priority has been placed on addressing fugitive emissions from the oil and natural gas sector
  - Regulatory and non-regulatory agreements





# What Will Be in Each Compressor Facilities' Methane Emission Reduction Plan?

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- Key Areas Covered by Each Facility's Methane Emission Reduction Plan
  - Fugitive Emissions
  - Data collection and reporting
  - Compressors and pneumatic devices
  - Other emission sources
  - Fence-line measurements
  - Offsets





# Regulations or Data Driven Non-Regulatory Agreements?

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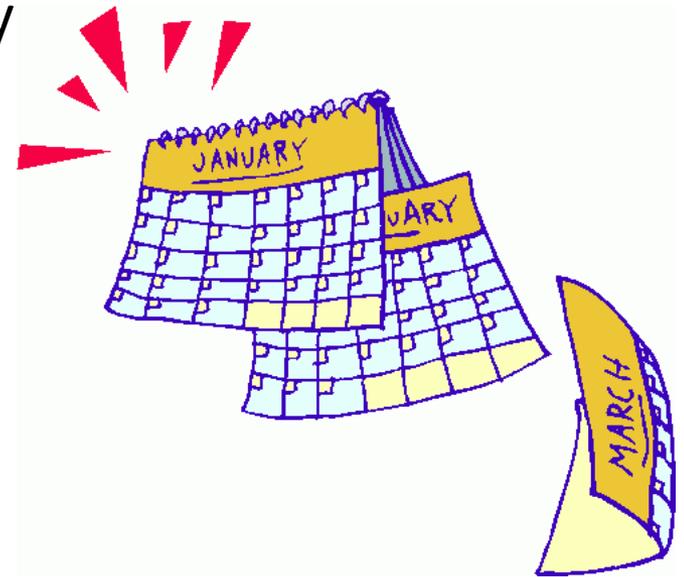
- Probably a bit of both - MDE discussing with stakeholders
- Some of the requirements may start off as non-regulatory, data driven agreements and be phased into regulations at a later date
- Following EPA and other State efforts





# Next Steps

- Compressor Stations
  - Next Stakeholder Meeting – January 2019
  - Non-regulatory Memorandum of Agreement - 2019
  - Regulation Adoption – 2019



# Questions





# Next Steps

- Compressor Stations
  - Next Stakeholder Meeting – January 2019
  - Regulation Adoption – 2019
- Landfills
  - Next Stakeholder Meeting – 2019
  - Regulation Adoption – 2019
- Wastewater Treatment Plants
  - Initial Stakeholder Meeting – Late 2019

