Breakthroughs in Carbon Management & Emissions Reduction

ECOS Fall Meeting – August 28, 2023
Introduction to Williams

**Williams:**
- Assets serve **14 key supply areas**
- Handle ~**33% of US natural gas**
- Wellhead to Water/End-User connectivity in the lowest emissions basins

**New Energy Ventures:**
- Business development team dedicated to decarbonization opportunities:
  - Low Carbon Products
  - Solar & Battery
  - Carbon Capture & Sequestration (CCS)
  - Hydrogen

Williams acquired MountainWest Natural Gas Transmission and Storage Business from Southwest Gas Holdings, Inc. in February 2023
Williams’ Climate Commitment

Since 2005:
- Reduced GHG emissions 47%
- Transmission capacity up over 140%
- Gathering volumes up nearly 4.5x

Since 2018:
- Improved methane intensity 39%
- Transmission capacity up 20%
- Gathering volumes up nearly 11%

Implementing operating practices focused on safety and emissions reductions
Modernizing equipment and investing in new technologies
Improving overall operations efficiency

Williams’ Greenhouse Gas Emissions vs. Natural Gas Handled

Volume + Capacity
GHG Emissions

2005: 14.3
GHG Emissions (Million metric tons CO2e)
Reduction in GHG emissions since 2005

2021: 22.6

Methane Intensity of Williams’ Natural Gas Operations (2018-2021)

Methane Intensity

2018: 0.03
2019: 0.025
2020: 0.02
2021: 0.015

Reduction in methane intensity since 2018

Emissions down while business grows

56% absolute reduction in company-wide GHG emissions by 2030 compared to 2005
Net Zero by 2050

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Enterprise Wide GHG Mitigation and Real-Time Operationalization

- Use **multiple** technologies and data sources (top-down and bottom-up) to detect, quantify, and reduce emissions
- Founded upon **measurement informed emission calculations**
- A **Facilities Dashboard** provides visual view of potential leak sources and associated emission intensity by equipment
  - Near real-time emissions quantification, combining source-level measurement with SCADA data
    - Daily / monthly emissions are categorized by equipment and by source type for each facility
      - Organize and consolidate emissions performance to compare equipment and prioritize emissions reduction opportunities across the system

**Example:** Compressor Emissions Intensity For A Given Facility
Natural Gas will be the Key to Meeting Future Energy Demand

Clean
- **Support climate goals:** replace emission intensive energy sources with clean burning natural gas
- **Ease of transport:** strong network of domestic infrastructure; rapidly expanding export infrastructure

Affordable
- **Low cost:** not reliant on subsidies
- **Efficient:** uses substantial infrastructure already in place
- **Economic:** cost-competitive to other fuel sources

Reliable
- **Dependable:** proven in periods of renewable electricity intermittency
- **Available:** ample reserves both domestically and internationally
- **Dispatchable:** very best solution for back-up power generation