Direct Testimony of Evan Hansen on Behalf of Appalachian Voices

State of North Carolina Utilities Commission

Biennial Consolidated Carbon Plan and Integrated Resource Plans of Duke Energy Carolinas, LLC, and Duke Energy Progress, LLC (Docket No. E-100, Sub 190)

Technical Conference

June 17, 2024

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Outline

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1. **Regulatory Risks** Related to Implementation of EPA's CAA Section 111 Rule

- New Natural Gas-Fired Power Plants
- Existing Coal-Fired Power Plants
- Interactions

2. **Other Risks** That Affect the Companies' Ability to Secure Sufficient Natural Gas at Affordable Cost to Fuel Their Proposed Build-Out of Natural Gas-Fired Power Plants

- Natural Gas Demand
- Pipeline Projects
- Volatility of Natural Gas Prices

1. **Regulatory Risks** Related to Implementation of EPA's CAA Section 111 Rule

CAA Section 111: Impacts on New Natural Gas-Fired Power Plants

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Three categories of new natural gas-fired power plants (CCs) in the rule

- Baseload (capacity factor 40+%)
  - 90% CCS by 2032
- Intermediate load (capacity factor 20-40%)
  - Highly efficient generation (no CCS)
- Low load (capacity factor <20%)
  - Burn lower-emitting fuels

CAA Section 111: Impacts on New Natural Gas-Fired Power Plants

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The Companies' model of the P3 Fall Base Portfolio did not account for this rule

- The proposed rule was acknowledged in Company documents and testimony
- But the P3 Fall Base Portfolio model did not account for:
  - Reduction in generation at CCs
  - New generation needed to make up for reductions at CCs
  - Increased costs

CAA Section 111: Impacts on New Natural Gas-Fired Power Plants

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To run new CCs as baseload plants, CCS is required (90% by 2032)

- According to the Companies: "CCS has not been considered cost-effective"*
  - Geology
  - CO_2 pipelines
  - Permitting
  - Property rights

*CPIRP Appendix C at 100

CAA Section 111: Impacts on New Natural Gas-Fired Power Plants

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To comply, the Companies discussed running new CCs less often

- If plants are run at lower capacity factor, CCS is not required
- The Companies' discussion was based on draft rule threshold of 50%, not final rule threshold of 40%
- This change is equivalent to new plants sitting idle for 37 days per year

CAA Section 111: Impacts on New Natural Gas-Fired Power Plants

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Running new CCs less often will increase costs

- Higher cost per kWh at new CCs
- Additional generation needed at more expensive existing plants or additional new plants
- Running CCs less often would increase PVRR by $3.6 billion relative to the P3 Base Portfolio. Increase would be higher:
  - Using the 40% capacity factor threshold in the final rule
  - Comparing to the P3 Fall Base Portfolio

CAA Section 111: Impacts on Existing Coal-Fired Power Plants

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Three categories of existing coal-fired power plants in the rule

- Long-term (operate on or after 2039)
  - 90% CCS by 2032
- Medium-term (cease operations by Jan. 1, 2039)
  - Emission rate limit based on 40% natural gas co-firing by 2030
- Short-term (cease operations by Jan. 1, 2032)
  - No emission reduction obligations

CAA Section 111: Impacts on Existing Coal-Fired Power Plants

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Roxboro 2 and 3 do not comply with the rule

- According to results for the P3 Fall Base Portfolio model, Roxboro 2 and 3 show generation from coal through 2033
- Classified as medium-term unit under the rule
- Model results show no co-firing of natural gas

CAA Section 111: Interactions

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Can the Companies delay closure of existing coal-fired power plants to generate additional electricity required due to running CCs less often?

- Not past 2038, without CCS at coal-fired power plant
  - Companies consider CCS to be infeasible
- Not past 2031, without 40% co-firing of natural gas
  - Even if feasible, would still need to shut down by 2038

CAA Section 111: Summary

P3 Fall Base Portfolio does not comply with the rule

- Capacity factors for new CCs are not limited to 40%
- Coal-fired Roxboro 2 and 3 units run through 2033 without co-firing natural gas
- Costs associated with compliance were not calculated by the Companies

CAA Section 111: Summary

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Recommendations to the Commission regarding CAA Section 111

- Require the Companies to develop one or more new portfolios that comply with the rule
- Require the Companies to assess ratepayer impacts of all candidate portfolios that comply with the rule

2. **Other Risks** That Affect the Companies' Ability to Secure Sufficient Natural Gas at Affordable Cost to Fuel Their Proposed Build-Out of Natural Gas-Fired Power Plants

Other Risks: Natural Gas Demand

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The P3 Fall Base Portfolio requires much more natural gas

- From: 276,000 MMcf in 2023
- To: 601,000 MMcf in 2030, when the Companies' natural gas use is projected to peak
- Increase: 325,000 MMcf

Other Risks: Natural Gas Demand

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Natural gas demand is also increasing in other sectors and in nearby states

- Natural gas power plant build-outs by utilities in other states
    - Georgia Power, South Carolina, TVA, Virginia Electric and Power

- Industrial and commercial sectors in North Carolina

- Increased LNG exports

Other Risks: Completion of Pipeline Projects

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Transco is fully subscribed

- New pipeline projects must be completed to bring additional gas to the region and to fuel specific power plants
- Pipeline project in-service dates are not within the Companies' control
- Many pipeline projects in the Eastern United States have been canceled in recent years, and others have been significantly delayed

Other Risks: Volatility

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In 2023, the Commission approved rate increases related to volatility in natural gas prices

- DEC: $693 million annually
- DEP: $208 million annually
- Related in part to the volatility of natural gas prices that occurred in 2022 due to Winter Storm Elliot and geopolitical events

Other Risks: Volatility

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The P3 Fall Base Portfolio makes the Companies even more susceptible to volatility

- In 2030, when the Companies' natural gas use is projected to peak, their projected delivered cost of natural gas is approx. $2.5 billion (based on $4.21 per MMBtu)

- If price were $6.00 per MMBtu, the cost would increase to $3.6 billion

Other Risks: Volatility

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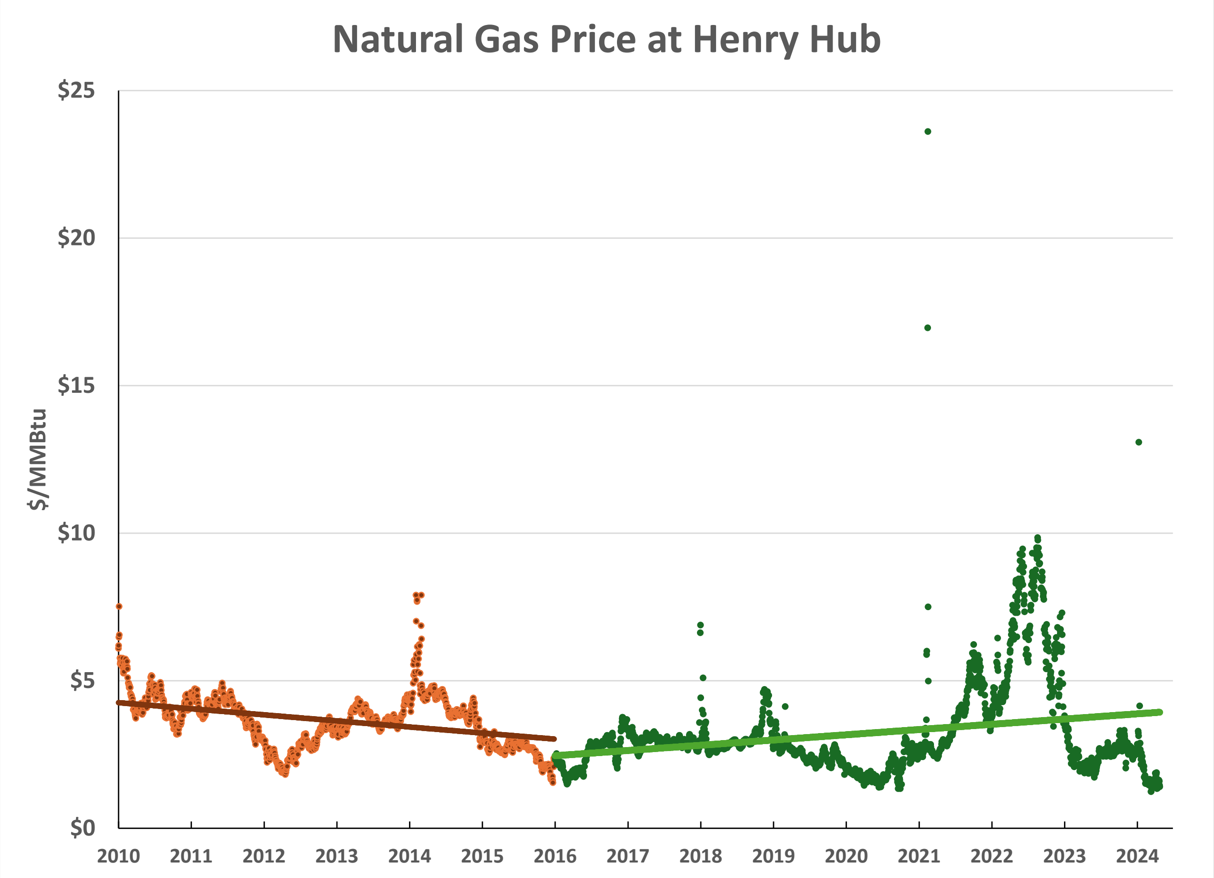
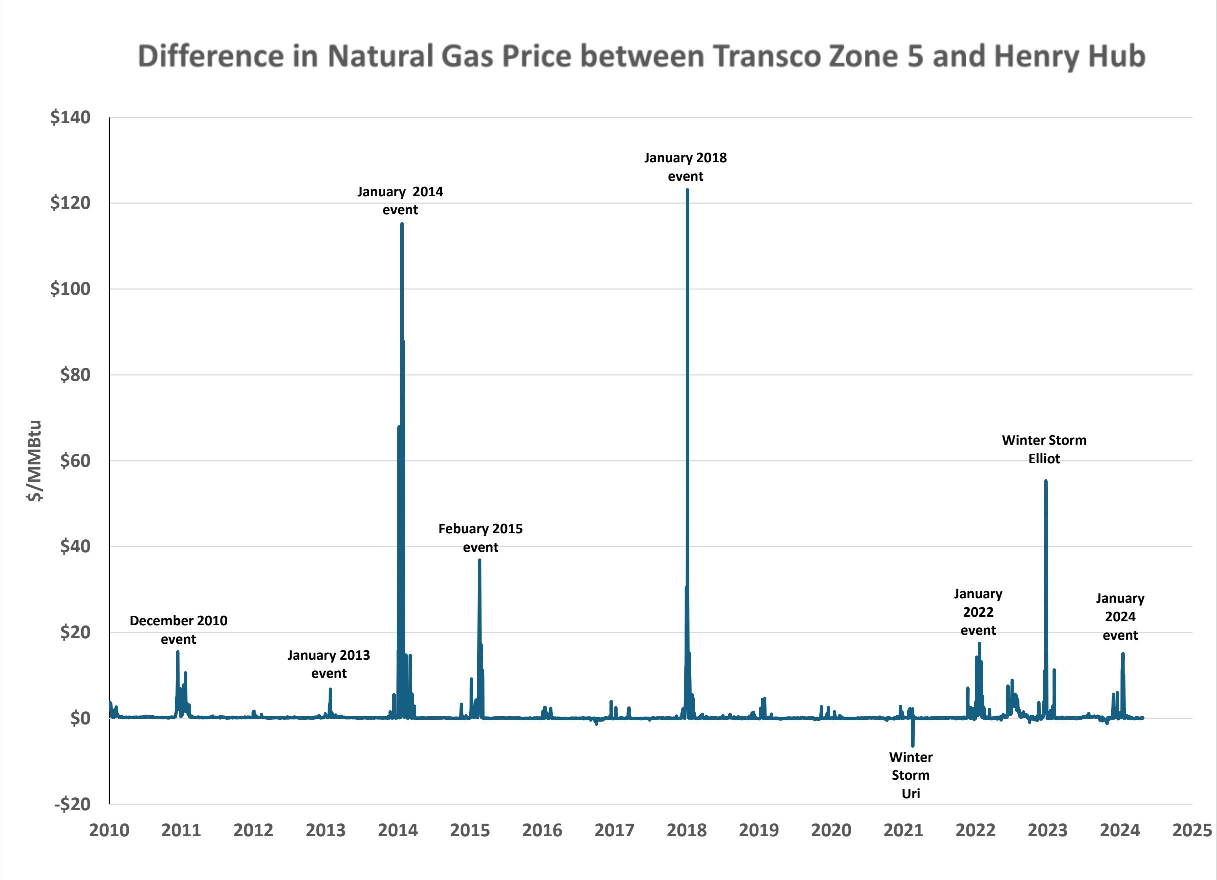
Natural gas prices have been more volatile since 2016



Other Risks: Volatility

Prices at Transco Zone 5 are more volatile than at Henry Hub



Other Risks: Volatility

Volatility increasing based on several factors

- Number and severity of extreme weather events
- Geopolitical events
- Exposure to LNG exports
- These factors are beyond the Companies' control

Other Risks: Summary

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P3 Fall Base Portfolio exposes the Companies and ratepayers to significant other risks

- Natural gas demand increasing in other sectors and in other states
- Pipeline projects must be completed to supply required gas
- Natural gas price volatility increasing
- These risks are generally beyond the Companies' control

Other Risks: Summary

Recommendations to the Commission regarding other risks

- Account for these other risks when making a decision in this CPIRP proceeding
- Compare the risks of the P3 Fall Base Portfolio to risks in any alternative portfolios that may be presented by other intervenors

Questions

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Evan Hansen

(304) 322-4592

ehansen@downstreamstrategies.com