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The Role of Natural Gas in the Environmental Movement

Validation of Direct Natural Gas Use to Reduce CO2 Emissions

Background

National Energy Modeling System Study (NEMS-DGU)

- Full fuel cycle ~ definition
- Electricity generated by coal & natural gas
- A “technology-ready” solution to CO2 reduction & energy efficiency
- A “technology-ready” solution for electricity DSM

Validation of Direct Natural Gas Use to Reduce CO2 Emissions

NEMS Study Objectives

- Assess CO2 emission reductions, energy savings, and cost savings through the direct use of natural gas and displacing less efficient technologies
- Compare the merits of increased direct gas use relative to other options to meet national CO2 emission reduction goals

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Results and Observations

- Under all natural gas direct use scenarios, primary energy consumption, costs, and CO2 emissions were reduced
- The combined impact in 2030 of all natural gas direct use scenarios:
 - 1.9 Quads energy savings per year
 - 96 million metric tons CO2 emission reduction per year
 - \$142 billion cumulative consumer savings
 - 200,000 GWh electricity savings per year
 - 50 GW cumulative power generation avoided



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Results and Observations

- All reductions achieved by encouraging natural gas use are significantly lower than electric subsidy scenario
- Natural gas encouragement scenarios result in 2% price increase (residential), no increase (commercial)
- Direct natural gas use subsidy has a significantly lower gross cost per metric ton (tonne)
- Retrofit markets pose unique challenges for CO2 emission reduction strategies



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Key Findings

- Direct use of natural gas decreases total energy demand
- Direct use of natural gas decreases power generation needs
- Direct use of natural gas reduces CO2 emissions
- Direct use of natural gas reduces net societal costs

Direct Use of Natural Gas Increases the Nation's Energy Efficiency and Reduces Carbon Output

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