



A BRIEFING NOTE FROM THE  
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# Natural Gas For Transportation or Electricity? Climate Change Implications

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Projections of increased domestic supply, low prices, reduced reliance on foreign oil, and low environmental impacts are supporting the increased use of natural gas in the transportation and electricity sectors. For instance, a tax credit bill (H.R. 1380) introduced in the House earlier this year encourages natural gas use for transportation and anticipates reductions in greenhouse gases (GHGs) when it displaces gasoline and diesel. However, in reality, the amount of GHG emissions that can be reduced with natural gas is uncertain and depends on the end use. If natural gas displaces coal for electricity generation, GHG emissions are reduced by at least 45% per kWh. But when natural gas is used as a transportation fuel there is up to a 35% chance that emissions will increase and only a 3% chance that it will even meet the emissions reductions mandated by the Energy Independence and Security Act (EISA) for corn ethanol. Given that future natural gas supply is limited, despite forecasts of increased domestic production, if one wants to be certain of reducing GHG emissions, then using natural gas to replace coal-fired electricity is the best approach. Investigators at Carnegie Mellon University have conducted an analysis in the attached study (1) that highlights the following important findings.

1. **High risk of policy failure:** The use of compressed natural gas (CNG) instead of gasoline in cars and instead of diesel in buses does not lower GHG emissions significantly. In fact there is a 10-35% chance that the use of CNG will result in higher GHG emissions than gasoline and diesel. Thus, if a climate policy with the objective of reducing GHG emissions were to promote the use of CNG as a transportation fuel, the policy has a relatively high risk of failing.
2. **Better uses for natural gas:** On the other hand, using natural gas at efficient power plants to provide base-load electricity instead of coal could provide greater GHG emissions reductions - 45% at the very least - with an almost zero chance that net emissions will increase. If the objective of a policy were the reduction of GHG emissions using a limited supply of natural gas, the best approach would be to use natural gas in power plants to offset coal use.
3. **CNG known to reduce non-GHG emissions:** Using CNG as a transportation fuel instead of diesel in heavy vehicles has been known to reduce non-GHG emissions such as particulate matter, carbon monoxide and nitrous oxide. The trade-off between reducing these non-GHG emissions and the risk of increasing GHG emissions by using natural gas as a transportation fuel needs to be analyzed.

## Reference:

1. Venkatesh, Aranya; Jaramillo, Paulina; Griffin, W. Michael; Matthews, H. Scott, 'Uncertainty in Life Cycle Greenhouse Gas Emissions from United States Natural Gas End-Uses and its Effects on Policy', *Environmental Science & Technology*, 2011, 45(19), pp. 8182-8189.