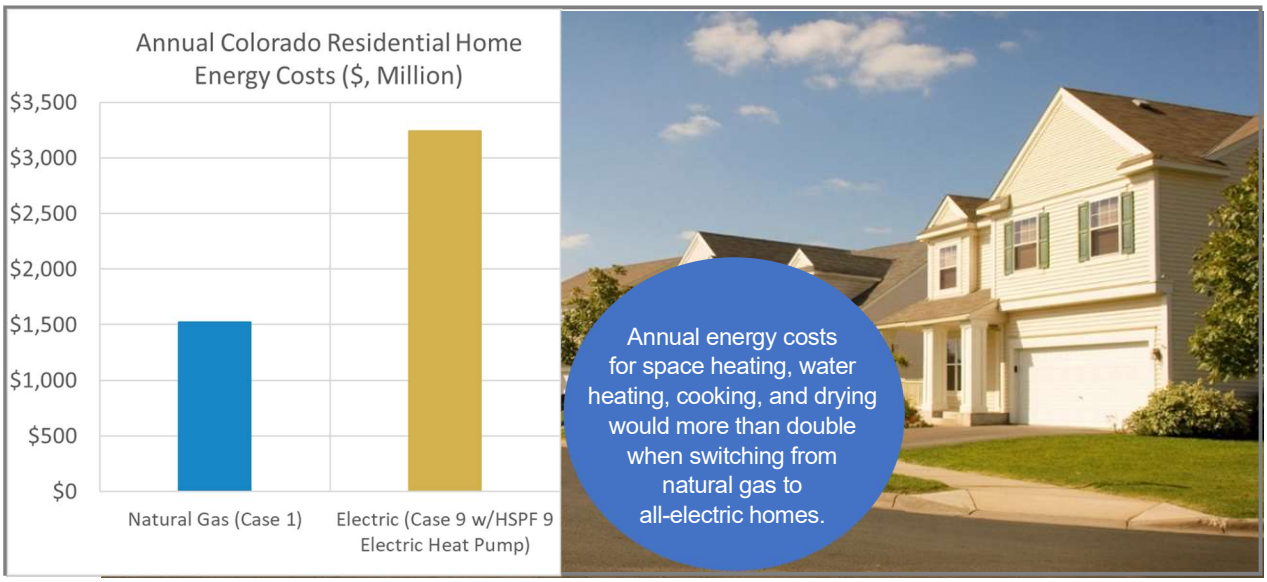
Comparison of Residential Natural Gas and Electricity Use in Colorado

Residential electrification leads to significant increases in annual energy bills for homeowners. The figure below compares energy costs if all natural gas homes in Colorado used available high-efficiency equipment for space heating, water heating, cooking, and clothes drying versus an all-electric home using typical high-efficiency electric appliances. Homeowners are also likely to face other upfront investments such as increasing the electric service to and inside their home to handle additional electric loads. Electric space heating also has higher lifecycle costs when using electric heat pumps that require more frequent replacement than natural gas furnaces.



For gas homes in Colorado, residential electrification increases annual energy bills and lifecycle costs for homeowners. Electric heat pumps (HSPF 9) and other electric appliances would increase annual consumer energy costs by 112% compared to efficient gas appliances – an increase of over $1.7 billion dollars per year for Colorado homes now using cost-effective and reliable gas service.

Natural gas pathways for greenhouse (GHG) emission reductions have lower costs (measured in $/metric ton of CO_2) than residential electrification (see table). Available high-efficiency gas equipment is a very cost-effective GHG abatement option, followed by approaches using renewable gas blends and/or next-generation natural gas heat pumps. Further reductions are possible with home envelope improvements (e.g., insulation, air sealing, high-efficiency windows).

Today, Colorado all-electric homes have a higher GHG footprint than a mixed-fuel home using natural gas and electricity. Future Colorado grid decarbonization efforts may lead to lower grid carbon intensity, but consumer costs for all-electric homes are higher than comparable natural gas pathways. Further, residential electrification – in particular, space heating – has significant impacts on power generation sources and electric transmission and distribution lines leading to cost and grid reliability risks and the likelihood of lower than anticipated GHG reductions. See full report for more details at: https://www.gti.energy/analyzing-residential-greenhouse-gas-ghg-emission-reductions/

GHG Reduction and Cost Examples	% CO_2 Reduction	$/Metric Ton
Natural Gas High-Efficiency Gas Equipment	-26%	-$83
High-Efficiency Gas Equipment with Renewable Gas Blends	-52%	$46
Emerging Gas Heat Pumps with Renewable Gas Blends	-63%	$184
Conventional Electric Heat Pumps (HSPF 9)/Appliances and Grid Power Improvements	-58%	$405