

## Natural gas: the clean, affordable choice

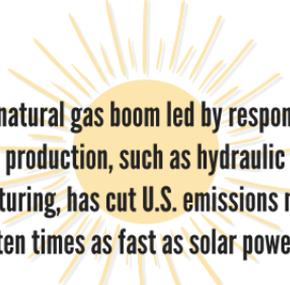
Natural gas is a highly efficient form of energy due to its simple chemical composition consisting of one carbon atom and four hydrogen atoms (CH<sub>4</sub>).

Natural gas' advantages over other fuels include the following: it has fewer impurities, it is less chemically complex, and its combustion generally results in less pollution.

Natural gas is affordable, abundant, and domestic. Households that use natural gas for heating, water heating, cooking and clothes drying spend an average of \$874 less per year than homes using electricity for those appliances.

Source: American Gas Association

## More effective than solar in cutting GHG



The natural gas boom led by responsible production, such as hydraulic fracturing, has cut U.S. emissions more than ten times as fast as solar power has.

After peaking in 2007, U.S. carbon-dioxide emissions were 1,022 million tons (Mt) lower in 2014 than had they grown, since 2007. Of that reduction, 19 percent came from a fuel shift toward natural gas for electricity generation. Only 1 percent came from the increased use of solar power.

Source: Manhattan Institute

## Renewable energy needs natural gas



Natural gas is used to make fertilizer for ethanol.



Natural gas is used to make hydrogen. Hydrogen is used to eliminate soot for cleaner diesel fuel, as well as fuel for hydrogen vehicles.



Electric utilities use natural gas to generate clean power and to backup and supplement renewable sources when they are not producing.



Natural gas is a raw material that goes into lightweight cars, wind power blades, solar panels and energy-efficient materials.

Source: American Gas Association

# California natural gas by the numbers



- In 2015, California produced 183 billion cubic feet of natural gas and Californians consumed 2111 billion cubic feet of natural gas.
- Two-thirds of California households use natural gas for heating.
- Natural gas accounts for about 30% of the state's energy source portfolio and provides 60% of the state's utility electrical needs.
- 11.5 million residential, commercial and industrial customers rely upon natural gas

Sources: California Energy Commission, California Department of Conservation, American Gas Association

## What others are saying...



"Interestingly enough, one of the reasons why we've seen a significant reduction of coal usage in the United States is not because of our regulations. It's been because natural gas got really cheap as a consequence of fracking...[Some environmentalists'] attitude is we got to leave that stuff in the ground if we're going to solve climate change. And I get all that. On the other hand, the fact that we're transitioning from coal to natural gas means less greenhouse gases."

**President Barack Obama**



"The technology that has done most to reduce U.S. greenhouse gas emissions is fracking. In the past seven years, the fracking-led natural gas boom has cut U.S. emissions more than ten times as fast as solar power has. And while renewable technologies are making significant progress, growth in their investment and deployment is slowing dramatically. Anyone serious about reducing carbon-dioxide emissions should be celebrating fracking both in the U.S. and around the world."

**Oren Cass, Senior Fellow, Manhattan Institute**



"The rapid deployment of hydraulic fracturing and horizontal drilling technologies, which has increased and diversified the gas supply... is an important reason for a reduction of GHG emissions in the United States."

**Intergovernmental Panel on Climate Change (IPCC)**



"...renewables and fast-reacting fossil technologies appear as highly complementary and that they should be jointly installed to meet the goals of cutting emissions and ensuring a stable supply."

**National Bureau of Economic Research**