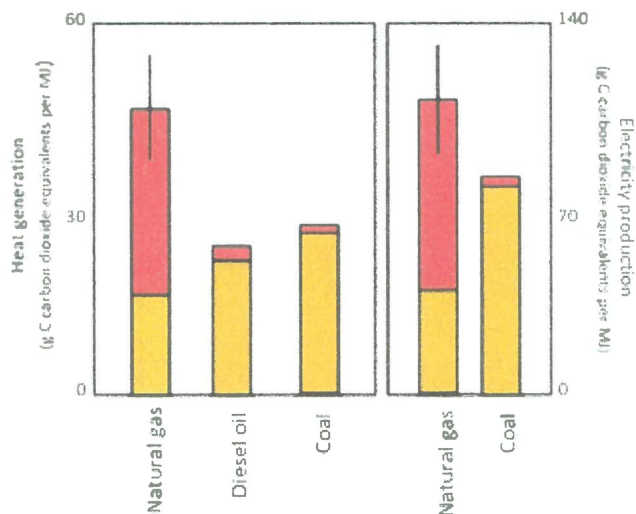


A bridge to nowhere: methane emissions and the greenhouse gas footprint of natural gas



Comparison of the greenhouse gas footprint for using natural gas, diesel oil, and coal for generating primary heat (left) and for using natural gas and coal for generating electricity (right). Direct and indirect carbon dioxide emissions are shown in yellow and are from Howarth et al. , while methane emissions shown as g C of carbon dioxide equivalents using the 2013 IPCC 20-year GWP are shown in red. Methane emissions for natural gas are the mean and range for the U.S. national average reported by Brandt and colleagues in their supplemental materials. Methane emissions for diesel oil and for coal are from Howarth et al. For the electricity production, average U.S. efficiencies of 41.8% for gas and 32.8% for coal are assumed . Several studies present data on emissions for electricity production in other units. One can convert from g C of CO₂-equivalents per MJ to g CO₂-equivalents per kWh by multiplying by 13.2. One can convert from g C of CO₂-equivalents per MJ to g C of CO₂-equivalents per kWh by multiplying by 3.6.

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