Potential Energy and Greenhouse Gas Emission Effects of Hydrogen Production from Coke Oven Gas in U.S. Steel Mills

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ABSTRACT

For this study, we examined the energy and emission effects of hydrogen production from coke oven gas (COG) on a well-to-wheels basis and compared these effects with those of other hydrogen production options, as well as with those of conventional gasoline and diesel options. We then estimated the magnitude of hydrogen production from COG in the United States and the number of hydrogen fuel cell vehicles (FCVs) that could potentially be fueled with the hydrogen produced from COG. Our analysis shows that this production pathway can achieve energy and greenhouse gas emission reduction benefits. This pathway is especially worth considering because first, the sources of COG are concentrated in the upper Midwest and in the Northeast United States, which would facilitate relatively cost-effective collection, transportation, and distribution of the produced hydrogen to refueling stations in these regions. Second, the amount of hydrogen that could be produced may fuel about 1.7 million cars, thus providing a vital near-term hydrogen production option for FCV applications.

Keywords: hydrogen, coke oven gas, fuel cell vehicles, well-to-wheels analysis

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