DOE Hydrogen and Fuel Cells Program Record	
Record #: 14015	**Date:** May 24, 2016
Title: Current U.S. Hydrogen Production	
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Item

The United States currently produces approximately 10 million metric tons (MMT) of hydrogen per year; a production scale equivalent to the fuel needs of roughly 50 million light-duty fuel cell electric vehicles (FCEVs). In comparison, worldwide hydrogen production is estimated to be between 61 and 65 MMT per year.[1,2]

Supporting Information and Calculations

- The United States produces approximately 10 MMT of hydrogen per year.

Table 1. U.S. hydrogen production (shown in MMT)[1,2]

U.S. Hydrogen Production (2014)	Source 1[1]	Source 2[2]
Captive Production	**5.26**	**5.86**
Petroleum Refineries	*3.60*	*3.40*
Ammonia	*1.27*	*2.03*
Methanol	*0.11*	*0.43*
Other(e.g., cyclohexane, aniline, etc.)	*0.28*	
Merchant Production	**3.77**	**3.83**
Refineries	*2.64*	*3.19*
Ammonia	*0.87*	
Other (e.g., cyclohexane, aniline, methanol, etc.)	*0.26*	*0.64*
Total Domestic Production	**9.03**	**9.69**

Hydrogen is an important chemical commodity in petroleum refining, ammonia production, and methanol production. For these industries, hydrogen is required on such a large scale that a majority of it is intentionally produced on site. This is called *captive* hydrogen production. In addition, *merchant* hydrogen is produced, shipped, and sold as an industrial gas. *Captive* and *merchant* production categories are the only categories considered in this record.[3]

- 9.7 MMT of hydrogen per year is a production scale equivalent to the fuel needs of up to 47 million FCEVs.

  The following assumptions were used to calculate the number of FCEVs powered by hydrogen:
  - Each new FCEV is driven 13,533 miles per year (2009).[4]
  - The fuel economy of a Toyota Mirai (the most prevalent light-duty FCEV) is 66 miles per kg of hydrogen.[5]

  The number of vehicle miles possible for a hydrogen production of 9.7 MMT:
  - 9.7 MMT x 1,000 kg/tonne x 66 miles/kg = 640 billion miles

  The number of FCEVs that can be fueled by 9.7 MMT of hydrogen per year:
  - 640 billion miles divided by 13,533 miles per vehicle per year = 47 million FCEVs

  For the purpose of this record, the United States hydrogen production is rounded to 10 MMT per year and the number of FCEVs this could theoretically support is rounded to 50 million.

Endnotes and References

[1] MarketsandMarkets. Hydrogen Generation Market: Global Trends & Forecasts to 2019, 2014. MarketsandMarkets team performed custom analysis on U.S. Production.
[2] Brown, D. US and World Hydrogen Production – 2014. CryoGas International. April, 2016.
[3] Hydrogen is also produced as an industrial *by-product* in industries including iron production, ethylene production, oil refining and chlor alkali industries. This hydrogen was not included in this analysis because it is not intentionally produced.
[4] National Highway Traffic Safety Administration, National Center for Statistics and Analysis, 2006. Vehicle Survivability and Travel Mileage Schedules. http://www-nrd.nhtsa.dot.gov/Pubs/809952.pdf
[5] https://www.fueleconomy.gov/feg/fcv_sbs.shtml