Items:

- 64 million metric tons of hydrogen would be needed to power 300 million hydrogen fuel cell vehicles in 2040.
- 300 million FCVs would be 80% of the vehicle fleet of 375 million vehicles projected for 2040.

Data/References:

The following values were based on the VISION Model: Description of Model Used to Estimate the Impact of Highway Technologies and Fuels on Energy Use and Carbon Emissions to 2050. Singh M., A. Vyas, and E. Steiner, Argonne National Laboratory, December 2003, ANL/ESD/04-1 (www.transportation.anl.gov/pdfs/TA/299.pdf).

1- 375 million vehicles projected for 2040 in the U.S. Vehicles refer to light duty vehicles as defined in the model.

2- 300 million FCVs is based on the model's assumption of the following FCV market sales rates: 4% in 2018, 27% in 2020, 78% in 2030, and 100% by 2038.

3- 13,000 miles per light duty vehicle in 2040. (Also from Transportation Energy Data Book: Edition 23-2003, Table 7.4 (7-4)).

4- 24.3 miles per gallon for conventional light duty vehicles in 2040.

5- 2.5 is the assumed ratio of FCVs miles per kg (or gge) of hydrogen to miles per gallon of gasoline for conventional vehicles.

Calculations:

300 million Fuel cell vehicles x 13,000 miles per vehicle per year = 3,900 billion miles driven per year

24.3 miles per gallon for conventional vehicles x 2.5 factor for fuel cell vehicle in 2040 = 60.75 miles/kg of H2 for a fuel cell vehicle.

3,900 billion miles divided by 60.75 miles/kg of hydrogen = 64 million metric tons of hydrogen required.