

Hydrogen as a Buildings Decarbonization Solution Yuri Freedman, Senior Director of Business Development Assembly Utilities and Energy Committee August 25th, 2021 In a scenario limiting global warming to 1.5 degrees, nearly half of global energy demand in 2050 is projected to be met with clean fuels

Projections for global final energy consumption in 2050



Source: BloombergNEF, IEA, IPCC. Note: The IEA's Current Policies Scenario is extrapolated using data form 2030 and 2040 to approximate final energy consumption in 2050. The 1.5°C compatible pathway is the median value for the 53 pathways analysed by the IPCC limiting global warming below 1.5°C, or 1.5°C with limited overshoot.

Source: BloombergNEF





Utility-Scale Solar PPA Prices for PV



Sample includes 232 contracts totaling 14.5 $\mathrm{GW}_{\mathrm{AC}}$



Source: Lawrence Berkeley National Laboratory





Sources: Hydrogen Council, McKinsey & Co.





Global and Local Hydrogen Initiatives

Hydrogen in Buildings

- UK: The H21 Leeds City Gate pilot project is exploring conversion of the entire city's heating grid to 100% hydrogen
- UK: Hy4Heat initiative investigating replacing methane with hydrogen in residential and commercial buildings and gas appliances
- Canada: Ontario and Alberta starting field tests of hydrogen blends for their residential customers; Quebec and British Columbia studying
- Japan: ~300,000 residential fuel cells; major fuel cell manufacturers are exploring their transition to hydrogen
 - Earlier this year Panasonic began demonstration of a hydrogen fuel cell generator

California

- California Energy Commission held a fullday workshop on hydrogen earlier this year
- Blending hydrogen into a natural gas network has already been demonstrated at University of California Irvine
- SoCalGas building H2 Hydrogen Home the first of its kind in the U.S.





Key Takeaways

- Building decarbonization approach needs to be holistic
 - Electrification will play a major role in new buildings
 - Decarbonization of existing buildings needs to include a broad range of electron- and molecule-based approaches
- A renewable gas standard, incorporating multiple clean gas pathways, will enable broader decarbonization
- California needs a state-wide hydrogen strategy
 - A broad integrated approach to decarbonizing the state, including buildings and other sectors
 - A good example is industrial hubs currently actively discussed at the federal level



