

The Critical Role of Hydrogen in a Net-zero Emissions Energy System
Ryan Jones, Evolved Energy Research

Hydrogen's role in net-zero energy systems is multifaceted. Its direct use is important in hard to decarbonize industrial and transportation subsectors and it can be used to derive drop-in carbon neutral fuels where needed. It can be derived from any primary energy type at reasonable efficiency and can be stored and transported in large volumes cheaper than can electricity. Given all this, resurgent interest in hydrogen has been an important research step beyond a focus on 'electrification only' strategies and helps underscore the serious decarbonization efforts underway.

However, hydrogen also faces real competition in zero carbon energy systems and the volume of its use and timing of its deployment varies significantly between decarbonization pathways. This talk will touch upon the following questions based on the latest net-zero energy systems modeling from Evolved Energy Research: (1) How much or how little hydrogen is used in different decarbonized energy systems? (2) What variables most impact these outcomes? (3) Where is hydrogen most competitive and when does it become so? (4) How and where does this hydrogen get produced?