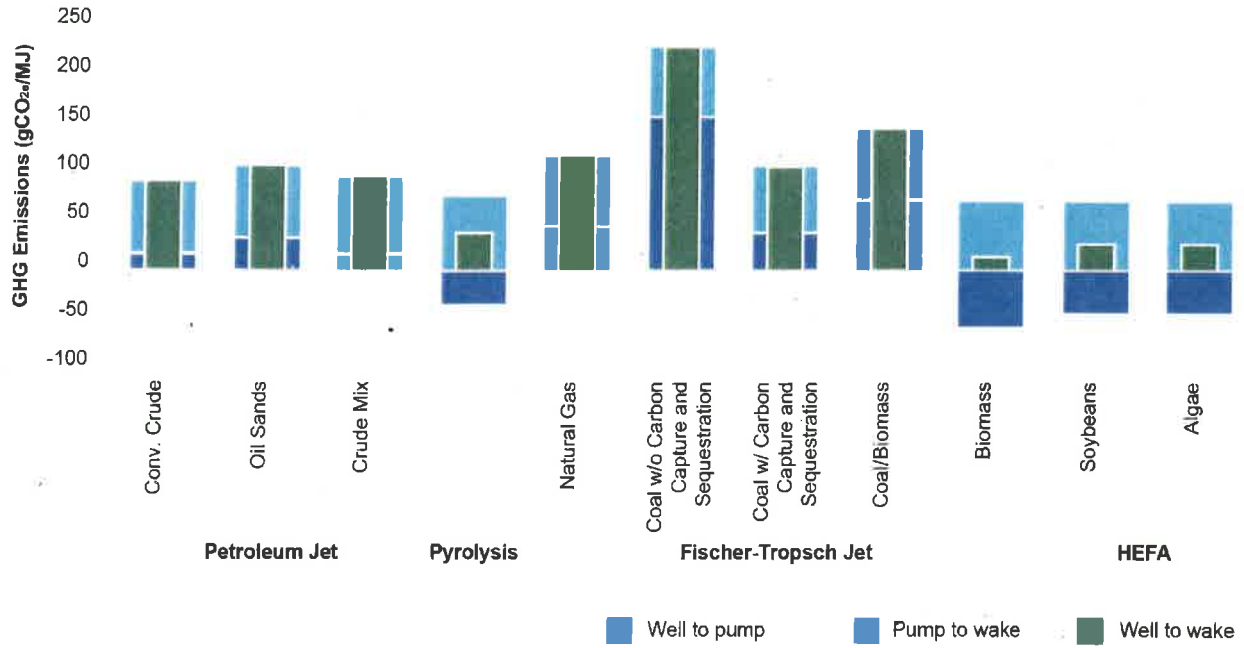


# EXHIBIT 1: WELL TO WAKE GHG EMISSIONS BY ALTERNATIVE JET FUELS PRODUCTION PATHWAYS



Note: gCO<sub>2</sub>e/MJ equals units of greenhouse gas per units of energy

Source: "Life-cycle Analysis of Alternative Aviation Fuels in GREET" A. Elgowainy 1, J. Han 1, M. Wang 1, N. Carter 2, R. Stratton 2, J. Hielman 3, A. Malwitz 4, S. Balasubramanian 4; 1-Energy Systems Division, Argonne National Laboratory, 2-Massachusetts Institute of Technology, 3-Massachusetts Institute of Technology, currently with the FAA, 4-John A. Volpe National Transportation Systems Center