CH692 in class w10d1

Consider the bipolar plate pictured below. Assume the dimensions of the active area containing the serpentine channels is 6 cm by 5 cm and that the channels are 1 mm wide and 1 mm deep. *Making reasonable assumptions and known engineering approximations,* calculate the pumping energy needed to flow O_2 through the cell if you operate at 2 A cm^{-2} and want a utilization of O_2 of about 50%. What fraction of the fuel cell output energy, assuming H2 as the fuel, is this, about?