Microbial fuel cells (MFCs) are devices that use bacteria to oxidize organic matter and generate current whereas microbial electrolysis cells (MECs) are a reactor for bio-hydrogen production by combining MFC and MEC. In an MEC, an external voltage must be applied to overcome the thermodynamic barrier. In this work, the MEC-MFC-coupled cells for bio-hydrogen and electricity production from organic waste waters, in which hydrogen was produced in an MEC and the extra power was supplied by an MFC. In this coupled system, hydrogen was produced from beverage without external electric power supply. The hydrogen production was elevated by increasing the beverage concentration, and the highest hydrogen production rate of 54 mL L⁻¹ d⁻¹ was achieved at 15% of beverage. The performance of the MEC and the MFC was influenced by each other. This MEC-MFC-coupled system has a potential for biohydrogen production from wastes, and provides an effective way for in situ utilization of the power generated from MFCs.