Supplementary Information

Hydrogen Evolution Catalyzed by Viable and Non-viable Cells on Biocathodes

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Figure SI1. Methane production of *M. barkeri* cultured in an unpoised reactor with 80% (v/v) hydrogen in the headspace to ensure that cells were able to grow in the reactor configuration used in this study.
Figure S12. Current uptake by *G. sulfurreducens* reactors during each cycle. The current being taken from the reactor for hydrogen production decreases between cycle 1 and 2, but then steadily increases for the duration of the experiment.
Figure SI3. Coulombic recoveries from reactors (A) inoculated with \textit{G. sulfurreducens} and/or \textit{M. barkeri} and (B) killed or no microorganisms. Each bar corresponds to a batch cycle (~1 month). Recoveries were calculated based on the ratio of Coulombs contained in the headspace gas and the Coulombs of current taken up at the electrode, as measured by the potentiostat. CRs in reactors inoculated with living cells far exceed 100% during an inoculation cycle, but decreased to ~100% after the fifth cycle due to an increase in current uptake at the electrode. The hydrogen production rate remained steady independent of the Coulombic recovery (Figure 1A).