# Supporting Information

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# Solar energy powered microbial fuel cell with a single reversible bioelectrode

This supporting information contains 4 figures and includes 5 pages. Figure S1 shows pictures of plates from the solar energy powered MFC and pictures of the experimental set-up. Figure S2 shows additional polarization curves and figure S3 shows photos of the oxygen producing and reducing biocathode. Figure S4 shows the effect of aeration on the performance of the reversible bioelectrode MFC.

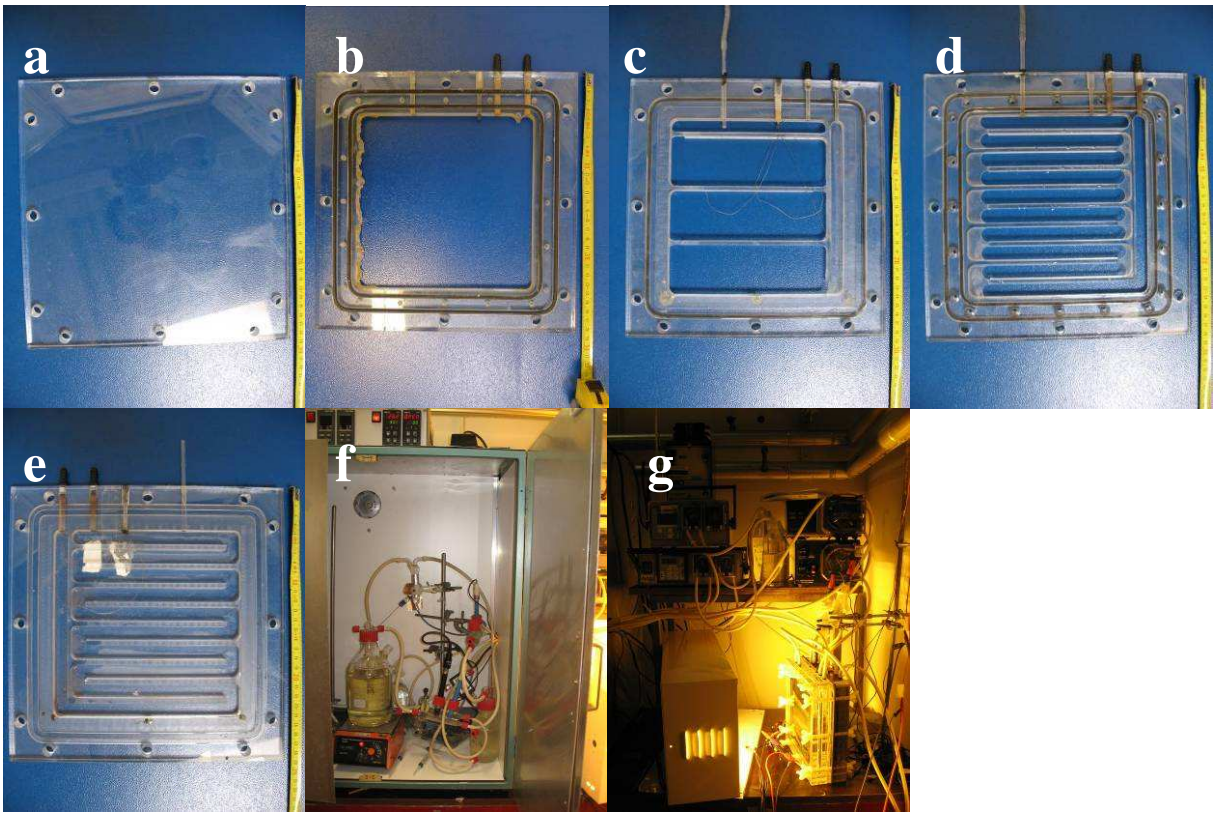


Figure S1. Photos of the solar energy powered microbial fuel cell; (a) massive plate, (b) flow channel plate as cooling mantle, (c) flow channel plate for reversible bioelectrode, (d) first flow channel plate for counter electrode, (e) second flow channel plate, (f) circulation circuit and sensors in temperature-controlled room (g) illumination and MFC.

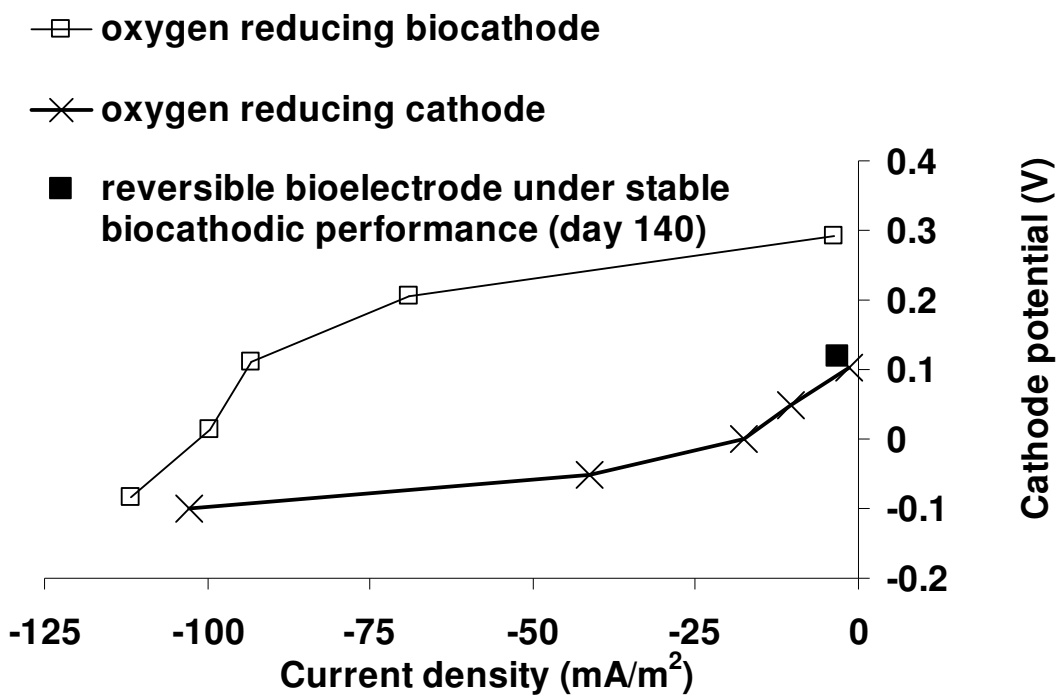


Figure S2. Polarization properties of the oxygen producing and reducing biocathode (with microorganisms; oxygen concentration = 7±1 mg/L; pH 7.0±0.2), oxygen reducing cathode (no microorganism; oxygen concentration = 19±1 mg/L; pH 7.0±0.2), reversible bioelectrode (oxygen concentration = 12±0.5 mg/L; pH 7.0±0.2).

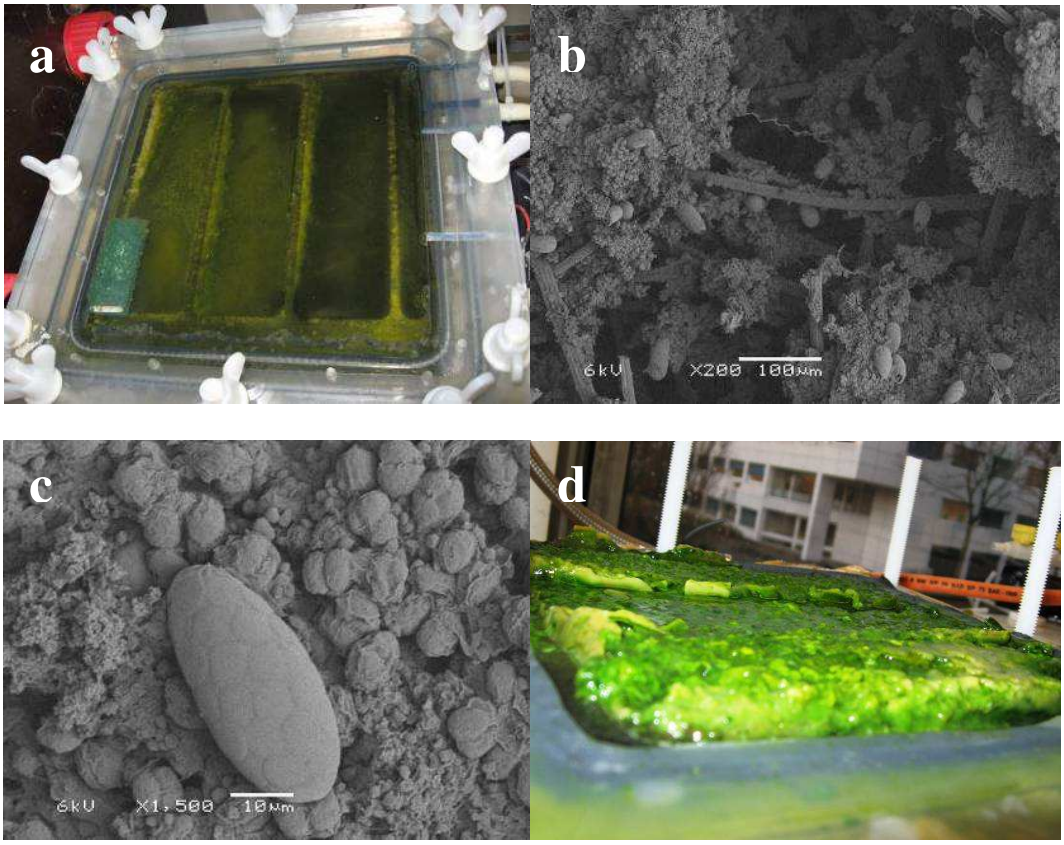


Figure S3. Photo's of the oxygen producing and reducing biocathode: (a) View on the illuminated cathode side of the MFC (day 76); (b) Overview SEM picture of the phototrophic biocathode showing a dense biofilm containing mixed cultures of micro-organisms (day 76); (c) Detail SEM picture of the phototrophic biocathode showing in the middle of the picture a pineapple shaped protozoa, likely *Trinema enchelys,* attached to the biofilm (day 76); (d) Picture of the 1cm thick biofilm of the reversible bioelectrode at the end of the experiment (day 148).

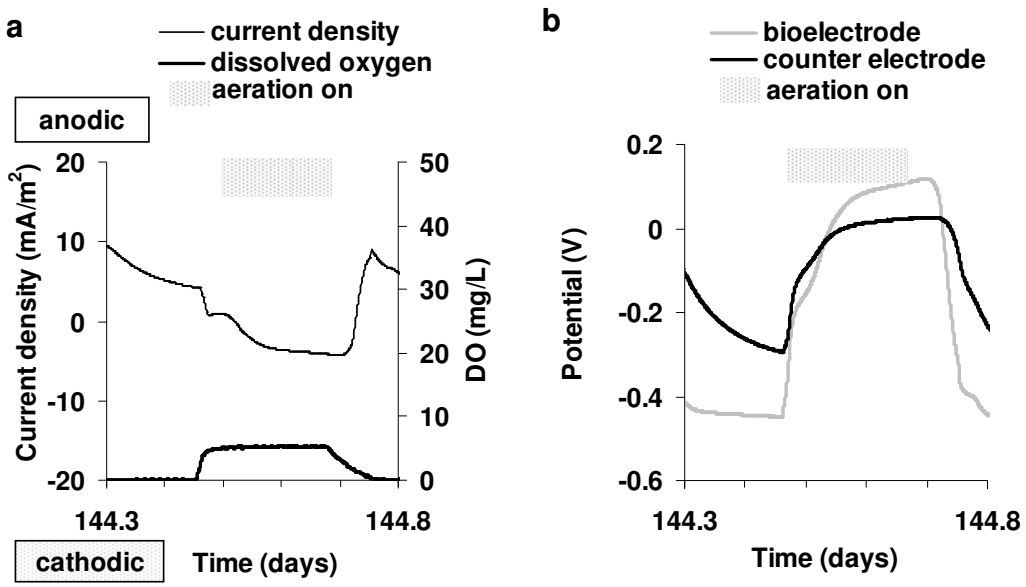


Figure S4. Effect of aeration on the performance of the reversible bioelectrode MFC. (a) Current density at 1000 Ohm external resistance and dissolved oxygen vs. time. (b) Bioelectrode and counter electrode potential vs. time.