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Revisiting electrons, protons, and energy conservation at hydrothermal vents during the emergence of life.

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In this poster, I will discuss the uncertainties of energy usage at the origin of life. It has been strenuously argued that the first organisms used the process of chemiosmosis to harvest energy, but I will argue here that the mechanisms that have been proposed were very unlikely to be used by the first cells. Instead, I propose researchers focus on alternatives such as substrate level phosphorylation and possibly thioester formation as early mechanisms of focusing energy. Towards this goal, I will discuss new data from simulated hydrothermal vent experiments where the focus is on electron transfer, and not proton transfer, as an energy source for driving molecules from their equilibrium in ways that may have been useful to the origin of life.