The effect of CeO\textsubscript{2} infiltration into the anode or CeO\textsubscript{2} mixed with the carbon-fuel on the performance of a Hybrid Direct Carbon Fuel Cell (HDCFC) was studied through the use of polarization curves and electrochemical impedance spectroscopy. The use CeO\textsubscript{2} in both ways helped to increase the cell performance. In particular, mixing CeO\textsubscript{2} with carbon represents the best strategy to increase the cell power output, probably due to increased formation of CO.