Reducing SOFC operating temperatures below 1000 °C has permitted less resistive and expensive ferritic stainless steel interconnects to replace ceramic materials. However, even specially developed ferritic alloys operated at elevated temperatures for lengthy periods of time form a chromia scale that increases the interconnect resistance and results in chrome diffusion from the interconnect to the cathode that causes a reduction in cathode performance. One attractive method to resolve the chromia scale growth and diffusion issues is to electrodeposit a Mn-Co alloy coating onto the interconnect surface and subsequently convert it to a (Mn,Co)₃O₄ spinel.

Under funding from the Department of Energy, Faraday Technology and WVU demonstrated that the electrodeposition process can produce Mn-Co alloy coatings with adequate adhesion after 2000 hrs at 850°C for specific compositional ranges and that a 3 μm coating is sufficient to minimize chrome diffusion to the surface after 500 hrs at 800°C in air. Furthermore, a preliminary economic assessment, based on a batch manufacturing process, suggests that the pulse/pulse reverse electrodeposition technology can meet the Department of Energy’s high volume target of 1,600,000 plates per annum at a cost of ~$1.23 per 25 cm x 25 cm coated interconnect. The poster will present the results obtained to date and provide a path forward for the technology.