A widely used adsorption energy scaling relation between OH* and OOH* intermediates in the oxygen reduction reaction (ORR) and oxygen evolution reaction (OER), has previously been determined using density functional theory and shown to dictate a minimum thermodynamic overpotential for both reactions. Here, we show that the oxygen-oxygen bond in the OOH* intermediate is, however, not well described with the previously used class of exchange-correlation functionals. By quantifying and correcting the systematic error, an improved description of gaseous peroxide species versus experimental data and a reduction in calculational uncertainty is obtained. For adsorbates, we find that the systematic error largely cancels the vdW interaction missing in the original determination of the scaling relation. An improved scaling relation, which is fully independent of the applied exchange-correlation functional, is obtained and found to differ by 0.1 eV from the original. This largely confirms that, although obtained with a method suffering from systematic errors, the previously obtained scaling relation is applicable for predictions of catalytic activity.