We employ first-principles calculations to develop strategies for improving the thermoelectric response of selected oxides. The talk first focusses on substitutional doping in prototypical SrTiO(3), in particular on the consequences of induced spin polarization. In addition, we take into account uni-axial and bi-axial strain. The second part of the talk deals with the thermoelectric properties of the layered rhodates K(x)RhO(2) and Na(x)RhO(2), for which the roles of the cation concentration and the lattice parameters are investigated. Comparison of 2H and 3R phases (modified stacking of the atomic layers) provides insight into the effect of the inter-layer coupling.